ANNUAL MEETING OF THE INTERNATIONAL SCIENTIFIC COMMITTEE ON HISTORIC CITIES, TOWNS AND VILLAGES (CIVVIH) – ICOMOS

3RD CONFERENCE OF THE SUB-COMMITTEE FOR CENTRAL AND EASTERN EUROPE

LIVING HERITAGE:ADDRESING RISKS AND VULNERABILITIES

DISASTER MITIGATION ISSUES IN HISTORIC AREAS WITHIN THE FRAMEWORK OF URBAN PLANNING AND CONSERVATION

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STRATEGIES FOR ENHANCING HISTORIC CITIES' RESILIENCE TO DISASTERS

SEPTEMBER 10-15, 2025

KULDIGA, LATVIA

ICOMOS LATVIJA

CIVVIH ICOMOS

comité international des villes et villages historiques
international committee on historic cities, towns and villages

DISASTER MITIGATION ISSUES IN HISTORIC AREAS WITHIN THE FRAMEWORK OF URBAN PLANNING AND CONSERVATION

Disaster risk mitigation in urban planning, design, and conservation practices is critically vital for historic cities, towns, and villages. Considering the disaster cycle as a continuous process, integrating risk mitigation strategies into planning and conservation practices is essential.

In historic urban areas, disasters often result in more severe consequences than in the past, primarily due to population growth, inadequate planning, deficiencies in architectural design and construction, misinformation among residents, insufficient legislation and financial resources, the lack of trained personnel, limited political commitment, inappropriate land uses, and rising poverty levels.

DISASTER MITIGATION ISSUES IN HISTORIC AREAS WITHIN THE FRAMEWORK OF URBAN PLANNING AND CONSERVATION

Since the beginning of the 21st Century, studies on mitigating disaster effects, especially earthquake damage, have been limited to the practices of engineering experts on the subject.

Studies on disasters have been largely excluded from urban planners' and architects' planning, conservation, and design work, as well as from the agendas of central and local governments, universities, the public, non-governmental organisations, and the media.

In Türkiye, following the 1999 Marmara earthquake, numerous academic studies in architecture and urban planning were conducted, and applications were developed in relevant fields to mitigate the losses from both natural and human-made disasters (İde, F.,2015).

DISASTER MITIGATION ISSUES IN HISTORIC AREAS WITHIN THE FRAMEWORK OF URBAN PLANNING AND CONSERVATION

This presentation addresses risks, vulnerability and mitigation issues in historic settlements within the framework of urban planning and conservation, highlighting the responsibilities of planners, architects, and conservation practitioners in anticipating, preparing for, responding to, and recovering from disasters.

Main titles are:

-Disaster Mitigation Principles

-Disaster Mitigation- Based Planning and Conservation Process

-Disaster Mitigation Issues at the Urban Design Level

DISASTER MITIGATION ISSUES IN HISTORIC AREAS WITHIN THE FRAMEWORK OF URBAN PLANNING AND CONSERVATION

Primary considerations for disaster mitigation issues in historic areas within the framework of urban planning and conservation:

1. Evaluation of Natural and Cultural (Historic) Data: Conducting a comprehensive assessment of environmental conditions, infrastructure, and prior planning and conservation decisions that influence the development of historic areas after a disaster.

2. Identifying Population Needs: Analyzing affected populations' demographic and socioeconomic characteristics to establish appropriate standards for earthquake-resistant residential areas.

3. Resource Allocation and Management: Identifying and mobilizing resources necessary for planning and constructing post-disaster housing settlements.

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Disaster Mitigation Principles:

Urban planning and conservation for disaster mitigation should adhere to the following principles (Mileti, 1999; Blaikie, P., Cannon, T., Davis, I., Wisner, B., 1994; Platt, R.,1998), Burby, R., (ed.),1998; Gülersoy Zeren, N., Uzer, E., 2005; Gülersoy Zeren, N., 2024):

A holistic approach should be adopted for all possible disasters in the historic area: A well-coordinated strategy is essential, as multiple simultaneous hazards can amplify risks.

A coordinated and interdisciplinary study is required, given the complexity of disasters, which necessitates a multidisciplinary approach. Experts from various fields should collaborate to integrate social and physical aspects into disaster mitigation strategies.

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Disaster Mitigation Principles:

A detailed analysis of both the physical and social structures of the historical urban fabric should be made:

-Physical analysis is critical in historical urban fabrics: Conduct a parcel-based assessment of historic and other buildings and a detailed block-level study of usage densities at different times of the day.

-Social structure analysis is essential in historical urban tissues: Examine the community's demographic composition, considering potential heterogeneity.

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Disaster Mitigation Principles:

Obtaining the opinions of residents and determining their needs through participation increases success: Involving residents in the planning process enhances the plan's applicability and reliability by addressing their specific needs and concerns.

Environmental and social impact assessments should be conducted: Evaluate populations and properties exposed to hazards and assess potential damage during a disaster.

Education of communities about disaster preparedness is essential: All age groups in society should be educated on disaster preparedness.

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Disaster Mitigation Principles:

Possible losses should be estimated: Provide quantitative data on properties and individuals at risk.

Cost analysis should be conducted: Ensure the plan's feasibility through widespread community acceptance and a strong economic foundation.

Opportunities for economic empowerment should be created: Utilize tools to create opportunities for residents, fostering economic resilience.

Social empowerment measures should be taken: Plans should incorporate social strategies that address settlements' physical and economic aspects to enhance their applicability.

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Disaster Mitigation Principles:

There should be legal tools for the urban planning and conservation process: Incorporate all relevant legal aspects to facilitate the effective implementation of planning measures.

The actions of local and central government must be consistent: Effective urban planning and conservation require parallel and coherent decision-making across different levels of government to ensure a unified local approach.

DISASTER MITIGATION ISSUES IN HISTORIC AREAS WITHIN THE FRAMEWORK OF URBAN PLANNING AND CONSERVATION

Disaster Mitigation Principles:

Hazardous uses should be identified through detailed analysis, and priority should be given to lifeline structures: Key facilities, such as schools, hospitals, security buildings, communication hubs, and other critical infrastructure, should be prioritised. Additionally, urban settlement centres should be cleared of facilities that store or operate explosive, combustible, or toxic materials.

Homogeneity and uniformity are essential to ensure order in the structure: Structural regulations that encourage uniformity should be considered for mixed-use buildings, or controlled legislative measures should be implemented in areas with diverse usage.

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Disaster Mitigation Principles:

Necessary measures must be taken to prevent chain disasters: Industries and commercial activities that pose secondary hazards should be restricted in highly populated areas. For example, during the 1995 Kobe earthquake, 80% of total structural damage resulted from fires that spread from industrial sites to traditional timber houses (Hyogo Prefecture, 1995).

A distributed risk approach shoul be adopted in planning studies: Critical structures, such as administrative offices and communication centres, should be strategically dispersed throughout the city to minimize the risk of total loss and enhance post-disaster functionality.

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Disaster Mitigation Principles:

High-risk areas should not be left unused: Leaving high-risk zones unused may encourage the formation of illegal structures. These areas should be designated for recreational or low-density functions, such as parks and sports facilities.

Controlled use density should be determined: It is known from previous earthquake disaster experiences that when the density of the population increases, the loss of human lives dramatically increases, and evacuation operations become challenging. Also, usage density varies by day and priorities.

Controlled accessibility should be ensured: Functions/structures defined as the primary priorities should have continuous availability. Alternative evacuation and rescue routes should be developed to enhance emergency response efficiency.

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Disaster Mitigation Principles:

Strengthened infrastructure facilities should be determined: Electricity, natural gas, and water should have early warning systems. Infrastructure bases should be strategically placed in different locations to minimize the risk of losing them all at once.

Organized evacuation areas should be established: An evacuation area for each person at 1 square meter is considered secure for many earthquake experiences. (Tokyo Disaster Prevention Plan).

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Disaster Mitigation- Based Planning and Conservation Process

A Disaster Mitigation-Based Planning and Conservation Process is a structured approach to reducing risks and minimizing the impact of natural or human-made disasters.

The process involves identifying potential hazards, assessing vulnerabilities, and implementing proactive strategies to enhance resilience.

The process typically includes risk assessment, vulnerability analysis, mitigation strategy development, implementation, monitoring, and evaluation. Risk assessment involves identifying hazards such as earthquakes, floods, and wildfires and analyzing their potential impact on communities (ISDR. 2005, Lagorio, H,J, 1990, Cannon, T., 1994).

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Disaster Mitigation- Based Planning and Conservation Process

Vulnerability analysis assesses the degree to which populations, infrastructure, and ecosystems are susceptible to these hazards.

Based on this assessment, mitigation strategy development focuses on formulating measures such as conservation decisions, land-use planning, building codes, and emergency response plans to minimize damage.

Implementation then ensures the enforcement of these policies, the construction of resilient infrastructure, and the education of communities about disaster preparedness.

Finally, monitoring and evaluation involve continuously reviewing and updating mitigation plans to adapt to new risks and lessons learned.

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Disaster Mitigation- Based Planning and Conservation Process

By integrating disaster mitigation into urban planning and policy-making, communities can enhance their ability to withstand and recover from disasters more effectively.

A disaster mitigation-based planning process is defined as a structured approach carried out by a hazard reduction committee in collaboration with stakeholders and jointly implemented.

The committee serves as a mediator between government departments and the local community, aiming to enhance the community's capacity for disaster preparedness.

Community and local government capacity building will incorporate these practices and targeted training initiatives (Gülersoy Zeren, N.Uzer, E., 2005).

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Disaster Mitigation- Based Planning and Conservation Process

An effective planning process ensures a more precise problem definition and a more comprehensive analysis, ultimately reinforcing the role and responsibilities of the Hazard Mitigation Committee.

The following steps are defined to enhance the effectiveness of this process:

- Establish a Hazard Mitigation Organization Committee
- Preliminary Analysis, Data Gathering and Defining the Problem
- Conduct a Hazard Assessment Study
- Detailed Analysis and Synthesis for Hazard Mitigation Studies
- Prepare a Plan
- Implement the Plan and Monitoring (Gülersoy Zeren, N; Uzer, E. 2005; Gulersoy Zeren, 2024).

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Disaster Mitigation- Based Planning and Conservation Process

STEP ONE: Establish a Hazard Mitigation Organization Committee

The first step is to form a committee that includes representatives from higher-level government with expertise in hazard mitigation as well as representatives from all local groups. The committee assists with:

-Defining goals and integrating local knowledge and information using disaster risk mitigation tools.

-Directing and incorporating supporting studies conducted at various stages of the planning process.

-Formulating and applying provisional development controls until the plan is completed, approved, and implemented.

-Developing strategies for implementing the plan.

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Disaster Mitigation- Based Planning and Conservation Process

STEP TWO: Preliminary Analysis, Data Gathering and Defining the Problems

-In each area, issues should be defined based on local data and information.

Problems should be categorized as simple, complex, or a combination to establish priorities for subsequent sections.

-A precise definition of the problem will facilitate the planning process and contribute to successful implementation.

Problem Definition is critical in areas exposed to multiple hazards, where prioritizing the combined risks and their effects is crucial.

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STEP THREE: Conduct a Hazard Assessment Study

-The third step involves identifying and analyzing hazards that threaten the community and their potential effects (e.g., the number of people who could suffer losses, possible damages, and other economic consequences).

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STEP FOUR: Detailed Analysis and Synthesis for Hazard Mitigation Studies

Conducting hazard mitigation efforts.

The fourth step is to identify and analyze options for mitigating the hazards identified in Step Three.

-Identifying institutions whose actions could affect the nature of the hazard.

-Determining community goals and objectives related to land use and hazard reduction.

-Determining potential components of a hazard mitigation program and appropriate community measures.

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Disaster Mitigation- Based Planning and Conservation Process

STEP FIVE: Prepare a Plan

- Description of the plan objectives.
- Discuss the issues, problems, unique features, and values specific to the areas covered by the plan.
- Analysis of hazard mitigation policies.
- Description of how hazardous areas will be used and managed over the next 10 to 20 years.
- Description of the means and timing of implementation, including the designation of responsible individuals and agencies.
- Discuss the approaches to monitoring the implementation and impacts of the plan and specification of procedures for periodically updating the policy and program.

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STEP SIX: Implement the Plan and Monitoring

- After the governing body has adopted the plan, the hazard mitigation committee continues to meet regularly to monitor progress in implementing the specified measures.

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Disaster Mitigation Issues at the Urban Design Level

-Urban design processes encompass constraints/limitations that guide architectural design, as well as significant decisions that inform environmental design.

-These constraints may be related to land use, density regulations, transportation, and infrastructure decisions.

-As an intermediary phase between urban planning and architecture, urban design is a complementary disaster mitigation tool.

-The three main aspects of mitigation efforts at the urban design level are the relative location of buildings, their form, and the design of urban open spaces.

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Disaster Mitigation Issues at the Urban Design Level

- The positioning of buildings—whether detached, attached, or arranged in blocks—affects the extent of damage they may cause to one another. Due to the hammering effect caused by differences in building heights, detached housing should be encouraged.

- Location also plays a critical role in facilitating or hindering evacuation and rescue operations.

- When developing evacuation plans, special attention should be given to the needs of senior citizens and individuals with disabilities.

- Buildings with geometrically simple forms are structurally more resilient than asymmetrical ones.

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Disaster Mitigation Issues at the Urban Design Level

- More vulnerable structures should be designed with more substantial materials and structural elements to withstand the potential effects of disasters.

- Buildings with irregular shapes, such as L, T, H, U, or Y configurations, should be avoided, as they tend to vibrate in complex patterns during earthquakes, making them structurally weaker. Additional structural reinforcements should be implemented to reduce vulnerability if such shapes are used (Lagorio, 1990).

-Mixed-use buildings, particularly those with commercial spaces on the ground floor and residential units above, are more prone to damage. This is due to the excessive openness of the ground-floor façade, which weakens the structural integrity of the first story.

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Disaster Mitigation Issues at the Urban Design Level

- Urban open spaces play a crucial role both during and after disasters. They serve as immediate gathering points following an earthquake and can function as temporary shelter areas in the days that follow.

- Different scales of urban open spaces should be integrated into disaster planning, including evacuation zones, firebreaks, and designated meeting points (Department of Public Works, Government of New South Wales, in Burby, R., ed., 1998; Alexander, D., 2000; Gulersoy Zeren, N.,; Uzer, E., 2005).

DISASTER MITIGATION ISSUES IN HISTORIC AREAS WITHIN THE FRAMEWORK OF URBAN PLANNING AND CONSERVATION

Conclusion:

Uncontrolled urban growth and illegal settlements exacerbate the impact of disasters at the settlement level.

Mitigating effects requires coordinated and multidisciplinary efforts. Analyzing both natural and human-made data and informed policy decisions are crucial in planning and implementing post-disaster settlements.

Ensuring earthquake victims have swift and safe access to temporary and permanent housing is essential for restoring normalcy.

This issue remains a priority in planning, conservation and design studies today.

DISASTER MITIGATION ISSUES IN HISTORIC AREAS WITHIN THE FRAMEWORK OF URBAN PLANNING AND CONSERVATION
Conclusion:

Urban planning, urban design, and architecture are key disciplines in reducing disaster-related losses through tools such as zoning regulations, implementation plans, and design projects.

Strategically adopting these tools can minimize disaster risks at the settlement level.

Urban-scale mitigation efforts complement structural-level disaster preparedness, ultimately contributing to safer, more resilient historic cities.

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