BAUMUN'24
UNDRR
Study Guide

Nazrin Sadigova	*Committee Board Member*
İrem Ayber	*Committee Board Member*
Bengs İlban	*Academic Assistant*

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#WelcomeToBosphorus

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Letter From the Secretary-General

Dear Participants,

On behalf of the Secretariat and the entire Organization Team, it is my honor to extend a warm welcome to you all for the BAUMUN'24. As Secretary-General, I am thrilled to see intelligent, driven people from diverse organizations come together to have fruitful discussions and diplomatic engagements.

You will have the chance to participate in inspiring debates, negotiation sessions, and social events during the conference. There is no doubt that the diverse range of experiences and perspectives that each delegate brings to the table will enhance the success and energy of this conference.

Our dedicated team has put in endless hours to make sure that every detail of the conference is well thought out to give every participant a fulfilling and unforgettable experience. Through our committees and social events, we hope to establish an atmosphere that promotes friendship, teamwork, and a profound understanding of the UN's principles.

I invite you to approach each session of this intellectual experience with an open mind, a cooperative spirit, and a dedication to finding common ground. Your enthusiastic and active participation is what will make this conference a success, and I do not doubt that your efforts will make it something remarkable.

Once again, welcome back to the BAUMUN'24 and Welcome Back to Bosphorus. May your time here be filled with meaningful discussions, lasting connections, and a sense of accomplishment as we work together to empower tomorrow.

Sincerely,

İlgim Mina ABAT

Secretary-General of BAUMUN’24

Letter From the Committee Board

Dear Delegates,

Welcome to BAUMUN’24 and UNDRR Committee!

On behalf of the Committee Board for the UNDRR Committee at BAUMUN’24, we extend our warmest welcome to all delegates. We are thrilled to have you participate in this prestigious Model United Nations conference.

The UNDRR Committee focuses on critical issues related to disaster risk reduction and response, emphasizing the importance of cooperation and preparedness in facing global challenges. As delegates, you have a unique opportunity to engage in meaningful debate, negotiation, and problem-solving to address these pressing issues.

We, as the Committee Board members, Nazrin Sadigova and Irem Ayber meanwhile Academic Assistant Bengs Ilban will try all our best to ensure a successful and rewarding experience for all delegates.

We encourage all delegates to come prepared, engage actively, and collaborate with fellow delegates to make BAUMUN’24 a memorable and enriching experience. Your passion, commitment, and innovative ideas are essential in achieving the goals of the Undrrr Committee and making a positive impact on the world.

We wish you all the best in your preparations and look forward to seeing you at BAUMUN’24.

Best regards,

Committee Board
Nazrin Sadigova
nazrinfsadigova@gmail.com
İrem Ayber
iremayberr@gmail.com

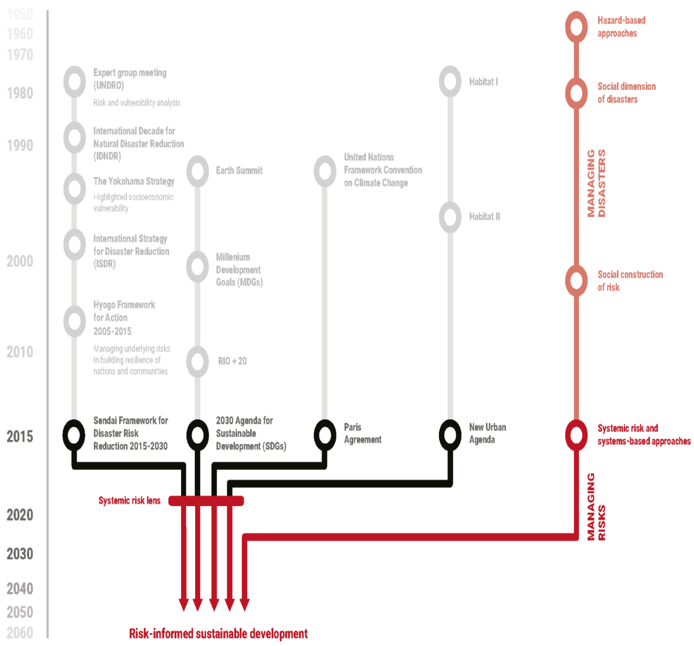
Committee Board's Note: This study guide contains many attributions to the Hyogo Framework 2005–2015 and the Sendai Framework 2015–2030; you are highly advised to browse the documents. The necessary links are provided in clause VIII.

I. INTRODUCTION

A. Introduction to the UN Office for Disaster Risk Reduction Committee

The United Nations Office of Disaster Risk Reduction (formerly known as United Nations International Strategy Disaster Reduction) was established on December 22nd, 1999. The UNDRR was created with the main aim of implementing risk reduction and enhancing global cooperation. Further focus areas include risk assessment, early warning systems, disaster preparedness, resilient infrastructure, and strengthening governance for disaster risk reduction. Since its establishment, many frameworks and agreements have been placed. The most crucial are the Sendai Framework, the Paris Agreement, and the 2030 Agenda for Sustainable Development.

Before UNDRR was established, the United Nations Disaster Relief Office (UNDRO) actively worked on disaster prevention and pre-disaster planning. Between 1989 and 1999, the International Decade for Natural Disaster Reduction (IDNDR) was declared. With conferences and frameworks held in this period, a global culture of prevention was established. Frameworks such as "Yokohama Strategy and Plan of Action for a Safer World" were established for disaster prevention, preparedness, and mitigation.



Currently, The UNDRR works to improve global resilience by advocating strategies and policies to reduce disaster risk and build sustainable societies.

B. Key Terminology

Capacity: Strengths and resources available within a community, organization, or society to manage and reduce disaster risks and strengthen resilience

Community Preparedness: The readiness of a community against a crisis, such as a natural disaster

Compliance Level: Measurement of an infrastructure and its degree of alignment with established standards

Cost-Benefit Assessment: Comparison of estimated costs and their expected benefits to evaluate an action

Non-Structural Retrofitting: Reinforcement process performed to the exterior of a structure

Risk Assessment: Procedure of analyzing possible disasters and their consequences

Seismic Retrofitting: Strengthening infrastructure to endure seismic movements, such as earthquakes

Technological Disaster/Hazard: Industrial, transportation, and man-made accidents

C. Value of Investment in Seismic Retrofitting and Construction Technology

According to the UNDRR, natural hazards caused nearly 74,000 fatalities globally during the last year. 63,000 of these deaths are related to earthquakes and geophysical hazards since natural disasters are unstoppable but preventable, seismic retrofitting gains significant importance much like other preventative measures.

Investing in seismic retrofitting is more than structural reinforcement, which saves lives prevents the spread of destruction, and mitigates expenses in the long term. According to The National Institute of Building Sciences (2019), seismic retrofitting that meets the lowest criteria has saved %25 of the cost. Also, seismic retrofitting ensures faster recovery and a stronger rebuilding for communities after such disasters. Strengthening governmental buildings such as hospitals and schools has supported local economies by ensuring essential services continue.

Residential and government buildings are not the only structures benefitting from strengthening projects. Such preservation measures are also carried out by the United Nations Educational, Scientific and Cultural Organization (UNESCO) on historical and cultural heritage sites. These reinforcements prevent the disappearance of cultural sites in a possible disaster.

II. Focused Overview of Seismic Retrofitting and Construction Technologies

A. Definition and Purpose

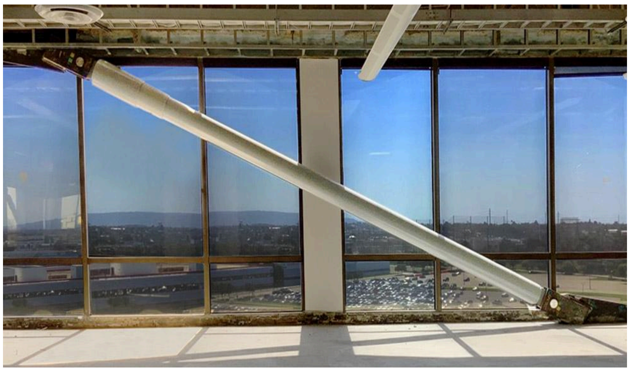
Seismic retrofitting is a vital part of civil engineering, aiming to enhance the structural integrity of buildings and infrastructure to mitigate the risks posed by seismic events. This process involves applying various techniques and technologies to existing structures to strengthen them against potential earthquake damage by fortifying vulnerable parts and implementing seismic-resistant measures, retrofitting endeavors to minimize structural vulnerabilities, and improving the overall resilience of buildings and infrastructure in seismic-prone regions.

The prominence of seismic retrofitting cannot be overstated, particularly in regions characterized by high seismic activity. In such areas, the risk of significant damage to buildings and infrastructure during seismic disasters poses a considerable threat to public safety and economic stability. Past seismic events, such as the 2011 Tohoku earthquake and tsunami in Japan or the 2023 Kahramanmaraş earthquake in Türkiye, have demonstrated the devastating consequences of insufficient seismic preparedness. 2015 Sendai Framework for Disaster Risk Reduction states that “It is urgent and critical to anticipate, plan for and reduce disaster risk in order to more effectively protect persons, communities and countries, their livelihoods, health, cultural heritage, socioeconomic assets, and ecosystems, and thus strengthen their resilience.”

Retrofitting and construction technologies in seismic retrofitting encompass a wide range of methods designed to enhance structural resilience and reduce seismic vulnerabilities. Instances are the implementation of base isolators, seismic dampers, and structural reinforcements like fiber-reinforced polymers or steel bracing. These technologies are strategically implemented based on structural assessments and seismic risk analyses to address specific vulnerabilities within buildings and infrastructure. In addition, progress in materials science and construction techniques continues to create innovation in seismic retrofitting, enabling the development of more efficient solutions.

B. Currently Used Techniques and Technologies

Concrete Jacketing: Concrete jacketing entails the application of a reinforced concrete layer onto pre-existing structural elements, such as columns and walls, to enhance their mechanical integrity and ductile properties. This process facilitates an augmentation of the structure's capacity to withstand seismic forces by optimizing its confinement and load-bearing characteristics.



Seismic Dampers: are structural components installed in buildings to mitigate damage caused by seismic events. These devices, attached at two points within the structure, absorb seismic energy, reducing structural deformations and minimizing damage. They are utilized in both new construction and retrofit projects to enhance seismic resilience.

Fiber-Reinforced Polymers (FRPs): Fiber-reinforced polymers, such as carbon fiber and glass fiber composites, are used to strengthen existing structural elements in buildings. They provide additional ductility and stiffness to structures, improving their seismic performance.

Base Isolation Systems: A base isolation system is a method of seismic protection where the structure is separated from the base. By separating the structure from its base the amount of energy that is transferred to the superstructure during an earthquake is reduced significantly.

Bracing Systems: The bracing system ensures the stability of the overall structure and individual components, transmits lateral forces to the foundation and auxiliary installation works, etc. For complex structures, the bracing system also plays a significant role in adjusting the stiffness of the structure while ensuring an even and rational stress distribution, thereby enhancing its integrity.

C. Current Advancements in Technology and Innovation

Building Information Modeling: Seismic Analysis and Random Spectrum Analysis (RSA) focuses specifically on sudden forces caused by earthquakes and their impact on structures. These methodologies employ computational models to simulate seismic movements and analyze a structure's response, assess the safety of a structure.

The Internet of Things (IoT): The Internet of Things (IoT) is a connected network of devices and appliances. Structural engineering products are implemented in structures and materials to offer early warning systems and real-time data about the structure's health. These sensors can detect structural changes, such as cracks, movement, and damage.

Drones and Unmanned Aerial Vehicles (UAVs): Drones and Unmanned Aerial Vehicles serve as tools to monitor the construction process, map the site, and perform post-build checks. These inspections during multiple steps reveal errors that can not be seen without devices.

Artificial Intelligence (AI) and Machine Learning (ML): Machine learning-based approaches and the implementation of artificial intelligence (AI) directly determine key elements of constructed structures. With gained experience, AI evaluates designs and makes decisions rather than relying on the judgment of individuals.

III. Essential Information for Future Actions

A. Challenges Faced in Resolving the Agenda

Navigating the complexities inherent in advancing seismic retrofitting and construction technologies poses significant challenges. These hurdles span various domains including financial considerations, technological advancements, regulatory frameworks, and community engagement. Overcoming these obstacles necessitates a concerted effort from stakeholders to devise effective strategies for enhancing structural resilience against seismic risks.

i. Challenges Regarding Technology and Investment

Regarding the fast development of technology in construction, challenges arose in sync. Each structure has its unique nature and characteristics. These structures require designing retrofitting solutions for their characteristics. The designing process can be time-consuming and costly. Engineers have to manage material limitations and architectural constraints. Considering the mentioned characteristics and differences, owners and individuals responsible for such structures have to consider cost-benefit analysis.

Meeting seismic building requirements is an expectation and challenge for the parties involved. With the improvement of technology, owners of older buildings have to manage between the development of structural strengthening and expenses. Owners have to go through paperwork, permitting processes, and guidance from experts in such fields to start strengthening steps of action. Occupants of such structures may be required to compensate for the retrofitting process, which may raise complaints.

ii. Challenges Regarding Governing and Policy

One of the leading challenges lies in balancing safety and economic effectiveness. Retrofitting and strengthening older buildings for seismic disasters requires significant costs. These conditions raise concerns about affordability for property owners and businesses. Policymakers are advised to find solutions to encourage intimidated owners. Encouraging moves such as tax incentives and low-interest loans to promote seismic retrofitting have been implemented by governments such as the government of the United States of America. Securing sufficient funding for vulnerable communities and public spaces is another challenge regarding monetary management.

Ensuring retrofitting efforts align with different building codes is another obstacle. Building standards vary across regions and jurisdictions; therefore, fostering consistent guidelines is complex. Establishing clear and compatible standards is required to implement retrofitting efforts. Preservation of historical structures presents another complexity. Standards for residential buildings and businesses are different from standards for historical structures. Retrofitting historic structures requires expertise to strengthen them in addition to preserving culture. Retrofitting historical sites fosters appreciation and raises awareness of seismic resilience. Educational campaigns often involve the circulation of information. By increasing public understanding, initiatives can be taken accordingly by the community.

iii. Challenges Regarding Community Engagement

Building trust with the community is essential for success in engagement efforts. Without the community's trust, challenges such as resistance, reluctance, and skepticism may arise.

Resistance by the community members is a common challenge. Some members of the community may be against change due to concerns about disruption, inconvenience, and change in their lives. These members may be against the change due to a lack of awareness, concerns about the cost, and perseverance of historical and cultural sites. Regarding the lack of awareness among the community, the government and non-governmental organizations may take part in educational steps. Educational materials and seminars highlighting the importance of retrofitting and the risks of earthquakes might be included. Furthermore, hosting meetings to diminish the concerns of the community could engage active participation.

Financial concerns associated with retrofitting processes is another challenge. Especially owners of older buildings or low-income households have such issues. Providing financial incentives, such as tax credits or offering low-cost retrofitting options can ease the financial burden meanwhile granting access to safety measures. In contrast to monetary issues, communities might have intangible concerns as well. In communities with historical buildings retrofitting procedures may be out of favor. Preserving architectural and cultural aspects of such structures while implementing seismic strengthening measures mitigates resentment of the community. To execute the retrofitting process while balancing the mentioned aspects working with experts such as historic preservationists, historians, and architects may be appropriate.

B. Major Parties Involved in the Issue

i. Governments

Governments play an indispensable role in responding to natural disasters and supporting the long-term recovery of affected areas. The government and all its organs hold the responsibility to prepare for any possible natural disasters and reduce the damage. They must have detailed information and data on possible risks, and their duty is to implement nationwide regulations and invest.
In the context of seismic hazards, governments play a significant role in reducing disaster damage by implementing and supervising necessary laws against non-eligible buildings. Government involvement in investments and continuous updates on new technologies, better data on seismic knowledge, and disaster response planning catalyze the aftermath of seismic disasters.

Case Studies on Government Policies:

Japan: Japan stands as a great example of seismic preparedness, evidenced by its strict building regulations, advanced early warning systems, and extensive public education campaign. Building upon its experiences, Japan has made a significant contribution to the development of international frameworks for disaster risk reduction, notably through the Hyogo and Sendai frameworks. Due to their splendid implementations, the 2022 Fukushima Earthquake took only 4 lives despite a magnitude of 7.3.

Türkiye: In Türkiye, construction regulations have been tightened following previous disasters, including a 1999 earthquake around the city of Izmit, in the northwest of the country, in which 17,000 people died. However, the laws, including the latest standards set in 2018, have been poorly enforced. The government has provided periodic "construction amnesties" - effectively legal exemptions for the payment of a fee, for structures built without the required safety certificates. Critics have warned that such amnesties risk catastrophe in the event of a major earthquake. Despite being a strong advocate of Hyogo and Sendai frameworks, insufficient implementation and supervision caused Türkiye to go through a devastating disaster aftermath, which led to the deaths of more than 50 thousands of its citizens

Chile: Chile, situated along the Pacific Ring of Fire, has long recognized the threat of seismic hazards, notably evidenced by the devastating earthquakes in 2010 and 2015. In response, Chile has implemented rigorous building codes and standards to enhance structural resilience, reflecting lessons learned from past seismic events. Chile's proactive approach to seismic preparedness extends beyond infrastructure measures to include comprehensive disaster management plans and public education campaigns. Furthermore, Chile has actively participated in international initiatives such as the Sendai Framework to contribute to global efforts in disaster risk reduction and resilience building.

Italy: The Italian government started working on the implementation of a national plan to ensure seismic preparedness, after the earthquake of 2016, which took 300 lives. The national plan is called Casa Italia and includes making structures earthquake-proof across the country and a range of other environmental measures.

ii. Non-governmental Organizations (NGOs)

Non-Governmental Organizations (NGOs) serve as examples of the many strategies and significant contributions made by civil society organizations in addressing seismic hazards and fostering community resilience. Organizations that work together with governments, local communities, and other stakeholders are essential in lowering the risks associated with earthquakes and lessening their effects on populations that are already vulnerable.

These NGOs often provide targeted assistance to vulnerable communities, raise awareness about seismic risks, and advocate for policies that promote resilience. One notable example is the International Federation of Red Cross and Red Crescent Societies (IFRC), which supports disaster preparedness and response efforts in earthquake-prone regions worldwide. They train volunteers and provide emergency relief to affected communities. For instance, in earthquake-prone areas like Nepal and Haiti, the IFRC has been significant in delivering emergency aid and supporting long-term recovery projects.

Build Change is an additional organization that works to enhance construction methods in seismically vulnerable areas. By collaborating with nearby communities, they construct and renovate homes and schools that are earthquake-resistant, lowering the susceptibility of structures to seismic risks. Build Change has implemented projects in countries like Indonesia, Colombia, and the Philippines.

Similarly, ShelterBox provides emergency shelter and essential supplies to families displaced by earthquakes and other disasters. They distribute tents, tools, and other items needed for temporary housing and support rebuilding efforts in the aftermath of earthquakes. ShelterBox has responded to earthquakes in countries like Nepal, Indonesia, and Pakistan.

iii. Private Sector Companies

The private sector holds great responsibility for reducing seismic damage. With their resources, logistical expertise, and innovative approaches, the private sector becomes indispensable allies in the monumental task of rebuilding, after catastrophes. Businesses in the sector hold a unique position during such situations. They can move around obstructions and act quickly thanks to their adaptable structures. Whether it involves providing support to NGOs or leveraging their technical knowledge and supplying essential goods directly their contributions can be swift and substantial.

C. Legal Framework

i. International Agreements and Guidelines

Eurocode 8: Eurocodes are ten European Standards focused on the design of buildings, civil engineering works, and construction products. Eurocode 8 manages how to design structures in the seismic zone. Its purpose is to ensure in an earthquake; human lives are protected, the damage is minimized, and structures essential for civil protection remain operational.

Asian Development Bank (ADB) Guidelines: ADB aims to assist countries in Asia and the Pacific region with financial investments to promote social and economic development. ADB established guidelines for providing loans, which include seismic resilience, preparedness, and retrofitting.

Paris Agreement: The Paris Agreement primarily focuses on mitigating climate change and its effects. Nevertheless, in the context of the Paris Agreement resilient infrastructure is crucial for adapting to the impacts of climate change.

Sustainable Development Goal 11: Sustainable Development Goal (SDG) 11 addresses Sustainable Cities and Communities. Earthquakes directly threaten SDG 11, as seismic events often cause extensive damage to housing, infrastructure, and transportation systems. Additionally, the prevention of earthquake-related disasters is key to creating sustainable cities.

ii. Government Intervention Programmes

Government intervention programs comprehend several key aspects to enhance the resilience of structures and infrastructure. These aspects include a risk assessment to identify vulnerable regions and areas. Building codes and standards are established and enforced to ensure structures meet safety requirements. Old, high-risk, or buildings that identify as non-compliant in assessments require retrofitting.

FEMA P-807 Guidelines for Seismic Retrofit of Weak-Story Wood-framed Buildings: The Federal Emergency Management Agency is an agency of the United States that focuses on the governmental response to natural disasters. The guideline of FEMA P-807 pursues strengthening multiple-story, wood-framed buildings.

The Earthquake Brace + Bolt (EBB):

iii. Sendai and Hyogo Frameworks

The Hyogo Framework for Action (HFA) and the Sendai Framework for Disaster Risk Reduction are two interconnected frameworks outlining the goals, aims and steps to be taken.

The HFA was the global blueprint for disaster risk reduction efforts between 2005 and 2015. Its goal was to reduce disaster losses by 2015 in the social, economic, and environmental assets of communities and countries. The HFA identified five priorities for action:

1. Ensure that disaster risk reduction is a national and a local priority

2. Identify, assess, and monitor disaster risks, and enhance early warning
3. Use knowledge, innovation, and education to build a culture of safety and resilience
4. Reduce the underlying risk factors
5. Strengthen disaster preparedness for effective response

Priority number four highlights the importance of retrofitting and rebuilding in order to protect and strengthen critical public facilities and physical infrastructure, particularly schools, clinics, hospitals, water and power plants, communications and transport lifelines, disaster warning and management centers, and culturally important lands and structures through proper design.

The Sendai Framework as the successor of the HFA takes the previous framework as a model. However, The Sendai Framework covers technological hazards, in addition to natural hazards. The Sendai Framework includes four clear priorities for action and seven global targets for the substantial reduction of disaster risk. To achieve these priorities seismic retrofitting to strengthen particularly structural and infrastructural practices are advocated.

These 4 priorities are:

1. Understanding Disaster Risk
   The framework stresses the importance of potentially hazardous activities to be able to target actions prevention, preparedness, and response.

2. Strengthening Disaster Risk Governance
   The framework can be regarded as a mechanism for regional and subregional cooperation, as it addresses local and boundaryless

disaster risk reduction in case the consequences of a disaster travel across borders and supports capacity building.

3. Investing in Disaster Risk Reduction
   The framework promotes the prevention of technological disaster risks and the obligation to adopt legislation for disaster risk reduction, requiring operators of hazardous installations to ensure and demonstrate the safe performance of their activities.

4. Enhancing Disaster Preparedness for Effective Response and "Build Back Better" in Reconstruction
   Specifically, the framework contains obligations to prepare, review, and update disaster preparedness policies ensuring the participation of all sectors.

IV. Feasible Future Actions of Outcome

Implementing seismic retrofitting and strengthening acts involves features regarding administrative, technological, financial, and participation vise.

A. Measures Regarding Technology and Investment

In light of the latest developments in technology employment of innovative engineering solutions such as base isolation systems and damping devices. Implementation of technological devices is not bound by mechanical conditions, the incorporation of digital tools such as Geographical Information Systems (GIS) to predict and visualize terrain can optimize retrofitting strategies. Investing in research and development leads to the creation of advanced techniques. By pairing technology and investment, seismic retrofitting efforts can be maximized while minimizing costs.

B. Measures Regarding Governing and Policy

Within the context of seismic retrofitting; governing and policy acts are composed to shape resilience. Collaboration and partnership across the private sector and agencies of the government to maximize sharing of knowledge, resources, and practices is crucial. Additionally, governments are required to monitor retrofitting regulations and enforce private property owners to satisfy seismic safety standards. As science evolves at any given time, objectives must evolve as well. Long-term objectives involve distributing resources for investments. The mentioned investments not only focus on retrofitting existing structures but also incorporating seismic resilience into new projects, including infrastructure.

C. Measures Regarding Community Engagement

To ensure the success of any retrofitting project, community engagement, and acceptance within the community are crucial. Establishing clear feedback mechanisms allows community members to share their input, report concerns, and monitor the progress. Forming or strengthening connections with local community-based organizations to ensure support on resources for outreach and engagement efforts is essential.

V. Conclusion

The UNDRR Committee concludes by recognizing the urgent necessity for funding seismic retrofitting and advancements in building technologies in order to protect communities from natural disasters and to secure their safety. In order to minimize the effects of seismic events, we urge member states to give this important project top priority when allocating funds and resources. This will promote global cooperation and the exchange of best practices. Together, we can embrace creative thinking and create a more resilient future for future generations.

"*The time to repair the roof is when the sun is shining.*"

- *John F. Kennedy*

VI. Questions to be Addressed

1. What are the challenges faced by communities and governmental and non-governmental organs due to a lack of applied measures?
2. How can international cooperation be enhanced to ensure a faster recovery for communities?
3. What role can international organizations play in encouraging advanced systems in seismic retrofitting and construction technologies?
4. What are the potential feasible solutions to ensuring a secure aftermath of seismic hazards?
5. In what ways could non-governmental organizations and private sector companies contribute to the measures taken?
6. Which actions taken by national governments and/or UN organs should be considered as examples to follow?
7. What role can public awareness play in resolving the issue?

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VIII. Further Recommended Readings

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