“Great natural disasters come to us when we forgot the last one.”

Maki Morikawa, 2019

Statement of originality

I certify and that this is my own work and that the materials have not been published before, or presented at any other module, or programme. The materials contained in this thesis are my own work, not a "duplicate" from others. Where the knowledge, ideas and words of others have been drawn upon, whether published or unpublished, due acknowledgements have been given. I understand that the normal consequence of cheating in any element of an examination or assessment, if proven, is that the thesis may be assessed as failed.

28 June, 2021, Trondheim, Norway

Denisa Koci Marku

Abstract

Centering on the earthquake of November 2019 the aim of this thesis explores the main problems that lead to the extensive building damages in the context of Durres city. The study combines desk work and fieldwork-based methods research to answer the research questions:

1) What is the building codes' impact on society's vulnerability to seismic hazards in Albania?
2) How is the process of disaster management and post-earthquake reconstruction organized and implemented?
3) How can the country generate good practices in lowering building environment vulnerability and building resilence?

Under the core concepts of resilience, natural hazards, earthquake risk, vulnerability, and building code, the conducted the case study analysis from three perspectives: i) governmental institutions, ii) NGOs, iii) community emphasizing building code as a fundamental approach in achieving good practices in lowering building environment vulnerability.

The findings revealed lack of/ outdated proper documents in building regulations, irregularities in the construction practices, as well as no use/ misuse of the building codes; outdated national documents in disaster management institutions; the community lacked/incomplete adequate knowledge over the building code regulations; no collaboration between responsible intitutions between one another, no cooperation with the community in disaster risk preparedness before the earthquakes, while emphasizing the role of NGOs in the emergency response and relief, as well as in the post-reconstruction progress.

Keywords: Durres earthquake, building code, building environment vulnerability

Table of Contents

Table of contents

List of Figures

List of Tables

Acknowledgements

The thesis was under the supervision of Yu Wang, Senior Researcher at NTNU, and Mrudhula Koshy, Lecturer and Doctoral Researcher at NTNU. I would like to thank them both for being supportive, for the their valid feedbacks and patience. Acknowledgements go to the interview respondents, who even though in a pandemic, did not hesitate to help me conduct my research.

Finally, I would like to thank my family for their unconditional support and love.

28 June 2021

Abbreviations

AUA	Albanian Union of Architects
AWPS	Association of Woman, Peace and Security
DCM	Decision of the Council of Ministers
DPPI SEE	Disaster Preparedness and Prevention Initiative for South Eastern Europe
EEFIT	Engineering Field Investigation Team
EU	European Union
FNO	Fundjave Ndryshe Organization
GFDRR	Global Facility for Disaster Reduction and Recovery
IFRC	International Federation of Red Cross's definition
IGJEUM	Institute of Geoscience, Energy, Water, and Environment
IM	Internal Ministry
IPCC	Intergovernmental Panel on Climate Change
NATU	National Agency for Territorial Unification
NCPA	The National Civil Protection Agency
NGO	Nongovernmental Organization
NHA	National Housing Agency
NPCE	The National Plan for Civil Emergencies
PDNA	Post Disaster Needs Assessment
PSRA	Probabilistic Seismic Risk Assessment
UN	United Nation
UNA	United Nations Albania
UNCRD	United Nations Centre for Regional Development Disaster Management
UNDP	United Nations Development Programme
UNDRR	United Nations Office for Disaster Risk Reduction
UNISDR	United Nations Office for Disaster Risk Reduction
USGS	U.S Geological Survey

1.Introduction

As one of the hazards that cause significant impacts on humans and the environment, earthquakes have attracted attention through time. The main consequences that the devastating and unpredictable natural hazard may produce on urban environments are uncountable damages to human lives, structural damage to buildings, social and economic losses (Cara et al, 2018, Cara, 2016). This thesis explores the consequences that earthquakes cause in Albania, emphasizing damages caused in the building environment. This call leads to understanding all the deficiencies linked to the building environment and its vulnerability to earthquakes.

Along with several other Eastern and Southeastern Balkans countries, Albania is characterized by a high degree of seismicity and has suffered a ≥ 6.5 magnitude earthquake almost every year (Aliaj et al, 2004). This study uses the earthquake of November 2019 in Durres city, Albania, as a case study towards introducing building code as a critical factor in the building environment vulnerability against earthquakes. Requires integrating a more fundamental question related to what makes Albania so prone to earthquakes. In one of the posts made about the event, United Nations Office for Disaster Risk Reduction asks: "Is the European country facing a rapid social and economic transition, including exploitation of land in a fast-growing economy, ready to reduce disaster risks proactively?" (UNDRR, 2020). The content in this research touches on some of these reasons and contributes on insights in developing future policies to lower vulnerability and build resilience.

In earthquake-prone areas globally, reducing damages caused by earthquakes requires immediate attention. Instead of focusing only on the initial triggering event, this research sees that it is more important to concentrate on cascading effects through vulnerability paths of the urban environment. Apart from the concentration of population, exposed buildings also play a role in turning the territory into a high-risk area. Damages caused by earthquakes do not depend only on high intensity but also on the vulnerability of the building structures (Dolce, Kappos, et al., 2006, Cara, S., 2016). Seismic vulnerability assessment in buildings is an essential issue in an earthquake-prone area, especially in Albania, where the buildings were constructed without following any criteria of seismic protection (see Chapter 4.)

The earthquake's impact on people's livelihood and the building environment can be reduced. This could be addressed by implementing measures such as compliance of earthquake-resistant building design and construction standards, disaster risk reduction policies implementation, and community education and training programs towards building urban resilience. With urbanization increasing in developing countries and the pressure added on the building environment, this thesis builds on building code regulatory mechanisms for effective implementation, monitoring, reviewing, and awareness of disaster prevention in communities (UNCRD, United Nations Centre for Regional Development Disaster Management, 2008).

The introduction chapter begins with the earthquake background, laying out the inflicted damages and impacted consequences of the earthquake of November 2019, to understand the scale of vulnerability in which the country is currently.

1.1 Case study

On November 26th, 2019, all central Albania was shaken by powerful seismic tremors lasting for 30 seconds, as stated in the U.S Geological Survey records about the event. (USGS, U.S Geological Survey, 2019). The earthquake caused extensive damage to Durres, Thumana, Tirana, Kavaja, and many other neighboring areas, impacting in total 11 municipalities and more than 202,200 people. The disaster left behind 51 fatalities and more than 900 people were injured. Due to the extensive damages on buildings, approximately 17,000 people were left without homes, obligated to stay in tents. In a timeline of days, some of them were placed in hotels, or with relatives. From the rescue operations, it was possible to rescue 48 people (PDNA, Post Disaster Needs Assessment, 2020). The PDNA reports estimates over 5,000 heavily damaged apartments in Durres and Tirana, over 20 demolished buildings, and thousands of families left on the streets, hundreds of small businesses destroyed, harming the economy, the building environment and the community. According to UNA, (2021), the country could not face this tragedy alone. The local rescue teams did not have proper training nor the appropriate types of equipment. Neighboring countries showed solidarity and were quick to act in helping. The first help searches and rescue team to arrive in the country was Kosovo. They were joined by Croatia, Greece, France, Germany, and many other countries

worldwide. Working all together, they managed to rescue the people trapped under the ruins (Novelli et al, 2021).

As the first immediate response from the Government of Albania (GoA), apart from mobilizing the rescue teams, it was activated the European Civil Protection Mechanism (EUCPM) and declared the state of emergency on the areas of impact. The response was followed by new measures in coping with the emergency situation and disaster management. In the long-term measures taken from GoA was generating new interventions for civil protection and developing new legislation for disaster risk reduction. To facilitate the recovery process, GoA relied on international support and guidance, and collaborated with local NGOs (PDNA, 2020).

Adressing the housing sector and the extensive damages, after the evaluation of the building damages had terminated, GoAś approach was by supporting the affected in i) giving grants to the citizents, whose house had low damages in structure and could be reinstated, ii) demolishing the buildings, which were specified dangerous from the evaluation and accommodating the owners in hotels, rental apartments or tents. This situation would continue until the process of post-earthquake reconstruction had taken place. GoA initiated the post-earthquake reconstruction project in the affected areas, where new houses would be provided for every citizen who had lost their homes after the earthquake.

This research analysis the steps taken by the GoA and the responsible intitutions in disaster management and post-earthquake reconstruction process emphasizing the importance of the compliance of the building code regulations towards building urban resilience.

1.2 Natural Hazards in Albania

Albania is a country with a comparatively high probability of being hit by natural disasters. It ranks among the countries with high economic risk to natural disasters. About 86% of its territory, generated over 88.5% of GDP, is vulnerable to two or more natural hazards (PDNA, 2020). Economic losses caused by natural hazards within the years between 1974-2006 estimate at a mean of 68.7 million USD per year, or about 2.5% of the GDP (Duro, 2015). Between 1989 and 2006, earthquakes and floods account for 17% and 31% of the disasters in Albania, respectively (Duro, 2015). Globally, Albania ranks 41st for landslide risk, 43rd for earthquakes, and 58th for droughts. The risks from natural disasters for Albania are: geological (earthquakes, landslides, rockslides); hydro-meteorological (floods, torrential rains, droughts, snowstorms, avalanches or snow blockages, windstorms); bio-physical (forest fires, epidemics) while manufactured ones consist of dam explosion, flood, and technological disaster. Albania also faces several environmental problems, adding high-risk areas due to pollution (hot-spots) (Duro, 2015).

Albania is characterized by a high degree of seismicity. Along with several other Eastern and Southeastern Balkans countries, it has suffered a ≥ 6.5 magnitude earthquake almost every year. Seven of the largest cities in Albania enter the realm with a probability of 75% of this risk. About 10% of Albanian territory is considered "unstable" and object to landslides. The country also is characterized by intense micro (1.0< Magnitude on the Richter scale $\leq$3.0) earthquake activity, small (3.0<M$\leq$5.0), medium-sized (5.0<M$\leq$7.0) earthquakes, and only rarely by significant (M>7.0) earthquake events (UN, 2014). Five powerful earthquakes affected Albania over the 20th century and resulted in considerable damage. Over recent years, two earthquakes in 2005 and 2009 (in the northeast of Albania and Peshkopia District M: 5.2 and M: 5.1) caused considerable material losses but no casualties. Substantial population growth and rural-urban migration reinforce Albania's vulnerability since these phenomena cause increased population density and concentrated economic activity in high-risk urban areas. A typical example is the rapid population growth within Durres, located in high seismic risk potential. A historical timeline of the strongest earthquakes which have caused massive damages to the country is presented below (Duro, 2015).

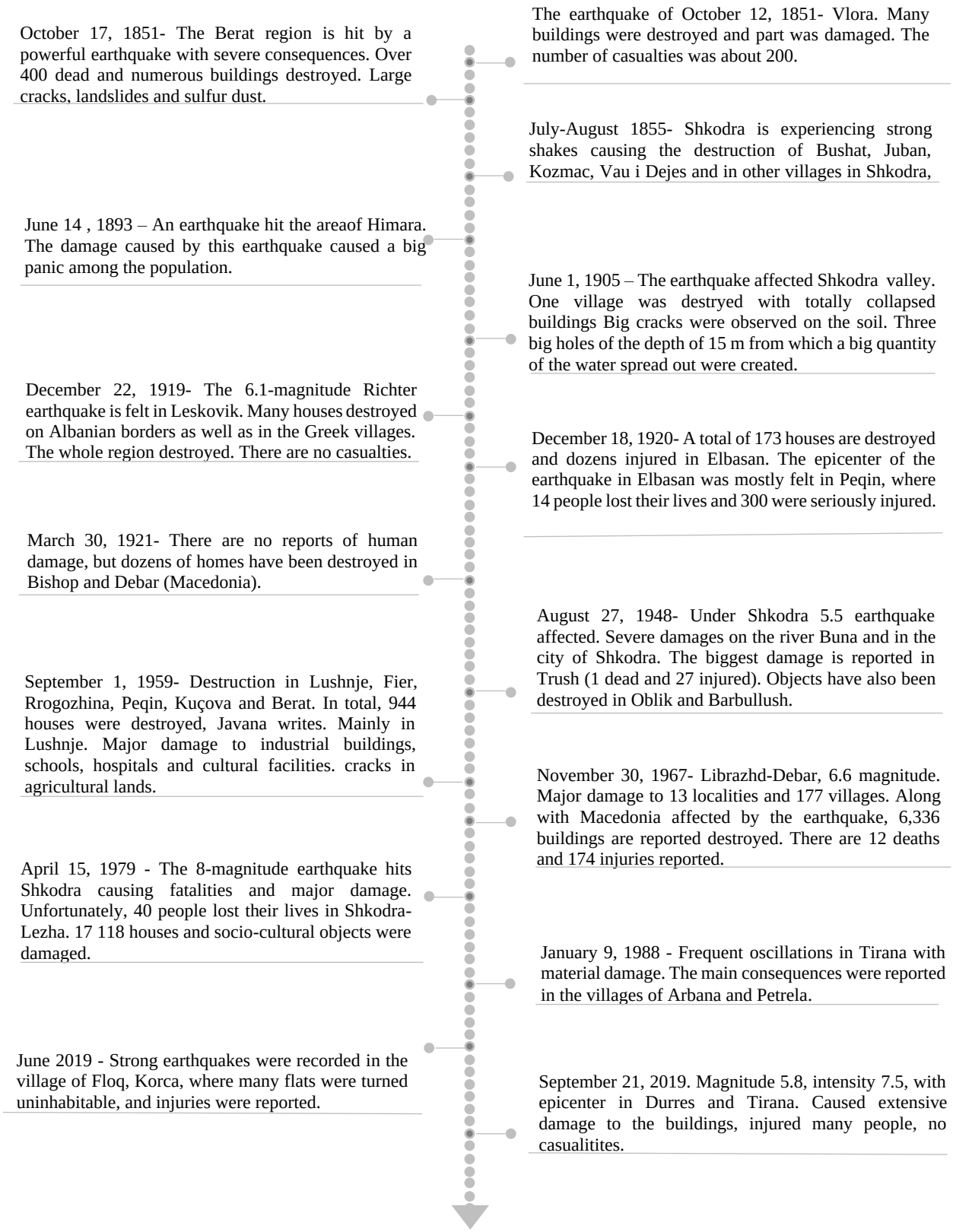


Figure 1-1. A historical timeline of the strongest earthquakes in Albania (Aliaj, 2010)

1.3 Low-quality building Environment in Albania

The earthquake of November 26th caused damage to more than 5,000 apartments in Durres city and demolished over 20 buildings. The damages exposed many deficiencies in the building structures above all. In spite of this, building design has received limited attention. Despite being in high scales of physical vulnerability (see chapter 2.), the country has not learned to adapt, starting with the construction abuse and inadequate seismic protection on building, contingency plans, and future events (PDNA, 2020). In the face of building resilience against earthquakes, scholars have stressed the vital role of lowering the structure's vulnerability to earthquake hazards and the threat they pose to their occupants (Aharonson-Daniel et al., 2018, p.2). This study emphasizes building code as a fundamental approach in achieving good practices in lowering building environment vulnerability and building resilence.

However, in Albania, there is a lack of understanding and contextualization, especially in implementation, where building code is considered theoretical in some cases. Theoretical considerations often fall out of reality and are challenging to implement. The construction regulations have not been implemented correctly or partly implemented, which led to many buildings being damaged or destroyed by the earthquake (see chapter 4.)

In countries where the building environment is of poor quality, the main threat comes from the collapse of the building structure. Often, this happens from constructions with inferior materials and not reinforced to meet or without respecting any seismic design criteria or seismic codes (Di Meo, Borzi, et al., 2018, Shapira, Aharonson-Daniel, et al., 2018). The construction practices have led to a vulnerable building environment that, combined with exposure to hazard, contributes significantly to a high level of seismic risk in the territory.

1.4 Aims and Objectives

1.4.1 Research questions

The research departs from an overlook of the earthquake of November 26th in Durres city and the caused damages, followed by unveiling that Albania is a country that has many times been in the same situation and is vulnerable to earthquakes. This research aims to explore and analyze some of the reasons that make Albania prone to earthquakes in terms of vulnerability and focus on revealing what would constitute promising approaches to reduce vulnerability and build resilience. Hence, the foundation for the research questions of the thesis sets:

1) What is the building codes' impact on society's vulnerability to seismic hazards in Albania?
2) How is the process of disaster management and post-earthquake reconstruction organized and implemented?
3) How can the country generate good practices in lowering building environment vulnerability and building resilence?

This thesis aims to fill the gap in the contextual understanding of awareness regarding building code being one of the main reasons to cause, prevent or lower the damages from earthquakes to the building environment.

1.4.2 Overall structure

The central part of the thesis consists of seven chapters, including introduction, literature review, methodology, the context, findings, discussion, and conclusion. In the literature review (chapter 2.), relevant theories and existing studies were analyzed, leading to a theoretical framework to guide this study. The methodology (chapter 3.) rationalizes the qualitative research design and sampling, data collection, and data analysis methods. Using the case study of Durres city as the scenery, this thesis then departs to explore the context and the reasons behind the building vulnerability (chapter 4.) and how those reasons were interpreted with the fieldwork and the desk work research (chapter 5.) In conclusion, the context and the findings frame this thesis within the theoretical background introduced in Chapter 2.

1.4.3 Methods and addressed audience

The methodology (chapter 3.) used in this research draws upon qualitative research design and data collection, data sampling, and data analysis methods to answer the research question(s) in the backdrop of the Durres earthquake case study.

This thesis also seeks to offer advice for engaging good practice in implementing building codes in Albania, aiming to address communities, governmental and non-governmental stakeholders, and construction institutes to make their impact in lowering earthquake vulnerability in the backbone of urban resilience. The addressed audience could also include policymakers, urban planners, and academics to consider building code as subjective regulations in the construction process and acknowledge their fundamental role in contingency processes under the big umbrella of urban resilience.

2. Theory/ Theoretical Perspective

This chapter introduces the theoretical perspective of the thesis. Based on the literature review, definitions and concepts of natural hazards, vulnerability, and building code are analyzed under the umbrella concept of urban resilience. The chapter concludes with a theoretical framework, which guides the study to the analysis and the discussion. Falling back to the first fundamental question of this study: 'What makes Albania prone to the impacts of earthquakes?' raises the necessity to look deep into the country's building environment vulnerabilities, its exposure to earthquakes, and supporting theories that open the platform for urban resilience.

2.1. Urban resilience

2.1.1 Urban Resilience as an umbrella concept

The thesis recognizes that urban resilience has a vast meaning and depends on the type of crisis (earthquake, flood, fire, terrorist activity, wars, financial or economic bankruptcy). If we refer to the historical timeline of earthquakes that have hit the country and its attempts to resilience, post-earthquake and resilient city reconstruction in Albania are complex and require a comprehensive, integrated, and transparent approach. Thus, this thesis will keep the term 'urban resilience' under the definitions of:

'' The capacity or capability of the urban system and natural environment, as well as the social interaction within it, to withstand external stresses, crises, and disasters; to adapt to the crisis as quickly and well as it did before the crisis; and consequently, to achieve a new state of physical, natural, socio-economic and institutional equilibrium'' (World Bank, 2015).

"The capacity of a system, community or society potentially exposed to hazards to adapt, by resisting or changing in order to reach and maintain an acceptable level of functioning and structure " (ISDR, 2021)

For an urban system, community or society to achieve resilience from a disaster it is empirical to work on emergency response and disaster reduction strategies, which involve various institutions that consist the structural part of that system, while emphasizing functions related directly to the community well-being. From the concept itself, it is deducted that the term resilience refers to environmental and natural values, urban development, and social behaviors that underline the influence of human activities. Therefore, to understand the process, it is necessary to study the politics, history, people, and communities of the context (Lewis and Kelman, 2010, p.207-208).

There is no unified definition for urban resilience as an umbrella concept, but a context-based adaptation can be made. Campanella, (2006) defines urban resilience as ´the capacity of a city to rebound from destruction´ (Campanella, 2006, p.143). In their review on defining urban

resilience, M. Sara, N.P. Joshua and Stults. M has created a table based on the definitions given on urban resilience by different researchers and authors (Meerow et al, 2016, p.41). Some of these definitions are presented in Table 1.

Table 01. Definitions related to urban resilience (Meerow et al, 2016, p.41).

Godschalk (2003)	…defines resilience as a "sustainable network of physical systems and human communities" (p. 137).
Lamond and Proverbs (2009)	"… encompasses the idea that towns and cities should be able to recover quickly from major and minor disasters" (p. 63).
Romero-Lankao and Gnatz (2013)	"… a capacity of urban populations and systems to endure a wide array of hazards and stresses" (p. 358).
Wagner and Breil (2013)	"… the general capacity and ability of a community to withstand stress, survive, adapt and bounce back from a crisis or disaster and rapidly move on" (p. 114).
Wamsler et al. (2013)	"…a disaster-resilient city can be seen as a city that has managed to; (a) reduce or avoid current and future hazards; (b) reduce current and future susceptibility to hazards; (c) establish functioning mechanisms and structures for disaster response; and (d) establish functioning mechanisms and structures for disaster recovery" (p. 71).

Lhomme et al. (2013)	"… defines it as the ability of a city to absorb disturbance and recover its functions after a disturbance" (p. 222).
Pickett et al. (2004)	"… the ability of a system to adjust in the face of changing conditions" (p. 373).

This multiplicity of definitions applies to different disciplinary areas or systems. As an umbrella concept, urban resilience constitutes various concepts concerning disaster management in urban planning—like vulnerability, risk, exposure, building environment vulnerability, building code, concepts which are elaborated on below.

2.2. Seismic Hazards

2.2.1 Earthquakes as natural hazards

As one of the few naturally occurring events, earthquakes can have devastating and tragic results. In the study about geotechnical earthquake engineering, Steven. L.Kramer identifies earthquakes as the ground tremors caused by seismic waves that radiate from the source and travel through the earth's crust to reach the surface. When the waves reach the surface, they produce shaking that may last from seconds to minutes and cause severe damage (Kramer, 1996, p.2-3). The earth's crust formation consists of seven large lithospheric plates and countless smaller ones. These plates shift towards each other (a convergent boundary), apart (a divergent boundary), or past each other (a transform boundary). Earthquakes occur commonly between the tectonic plates in the collision zone. Since these earthquakes are caused by the movements of tectonics plates, they are called tectonic quakes. (SED, 2021)

In an interview with Luljeta Bozo, professor at Polis University and University of Tirana, Albania, she defines earthquakes as:

" The earthquake is a periodical and natural phenomenon, defined as a process where a tremendous amount of energy is collected due to the deformation in the contact zones between

the tectonic plates and microplates is released. One of the most active areas, where 25% of the earthquakes happen, is the contact between the Euroasian plate and the African plate, where even Albania is situated. An engineer must: know where these earthquakes happen; know the values of vibration and motion; be aware of the correct measurements."

Common damages related to earthquakes are structural damages. Damages and collapse of buildings and other structures lead to death and cause economic loss in the affected area. Earthquake engineering science involves the mitigation of seismic hazards, which embed in the process of earthquake-resistant design. Even though only a few hazards can account for buildings' design, the effects of ground shaking on structures are dealt with when designing for earthquake resistance (Kramer, 1996, p.3). Egbelakin et al , (2013) cites `When buildings have insufficient seismic capacity, they contribute to the built environment's susceptibility to earthquake hazards and are the critical contributors to earthquake losses `(Egbelakin et al, 2013).

2.1.2 Earthquake risk

In the UNISDR (United Nations Office for Disaster Risk Reduction) terminology definitions about risk and disaster risk, and according to Erdik, (2017) the terms are underlined as risk can be confined as the combination of the probability of an event and its negative consequences. In contrast, the definition of disaster risk consists as

" the potential disaster losses that could occur to a particular community or society over some specified future period, lives, health status, livelihoods, assets, and services. In effect, "disaster risk" is taken to mean "potential disaster losses," which could be quantified or not ´(UNISDR, 2009, p. 9–10).

The definition of disaster risk reflects disasters as outcomes of continuously being present at risk. The diverse types of potential losses from disaster risk are difficult to measure. According ILO, (2012), it is possible to assess and map disaster risks in broad terms keeping in mind the dominance of hazards and population and socio-economic development patterns (ILO, 2012).

Relating to the context of this study and the theory presented, the researcher can define earthquake risk as potential building environmental consequences of earthquakes that occur in continuous specified periods. Moreover, as Erdik, (2017) states, the researcher can also determine earthquake risk by using loss modeling procedures, including here vulnerabilities of the social and built physical environment. ´In context, the loss is the reduction in the value of assets due to earthquake damage, and risk is the quantification of loss in terms of its probability (or uncertainty) of occurrence´(Erdik, 2017).

UNISDR, (2009), p.10–11, defines "disaster risk reduction" as follows:

"The concept and practice of reducing disaster risks through systematic efforts to analyze and manage the causal factors of disasters, including through reduced exposure to hazards, lessened vulnerability of people and property, wise management of land and the environment, and improved preparedness for adverse events.'' (UNISDR, 2009, p.10–1).

By quoting Wilkinson and Brenes, (2014), p.3, Stone.H, (2018) states that earthquake risk reduction may be demonstrated by increasing public knowledge of the earthquake risks, improving enforcing new or policy on land-use or construction regulations, and building codes, and improving disaster response plans (Stone, 2018).

Citing from ICSU-LAC, (2009), the conceptual frameworks used to understand and interpret disaster risk vulnerability and the associated terminologies have varied over time and differ according to the disciplinary perspective. Risk results from the interaction in time and space of exposed and vulnerable persons, their livelihoods and support infrastructures, and potentially damaging physical events. That means vulnerability is one core component of risk, while the risk is the product of the interaction of a hazard event with vulnerable conditions. In this context, understanding risk minimally requires knowledge about hazards and the processes by which human intervention in the natural environment creates new hazards (socio-natural); knowledge of the processes by which persons, property, infrastructure and goods, and the environment itself are exposed to potentially damaging events—i.e., understanding exposure (location and physical susceptibility); knowledge of the processes that contribute to the multi-dimensional vulnerability of persons and their livelihoods, and increases or decreases in this

social fragility condition— i.e., understanding the allocation and distribution of social and economic resources in favor of or against achieving the achievement of resistance, resilience, and security (ICSULAC., 2009)

A probabilistic seismic risk assessment (PSRA) involves estimating the probability of damage and losses resulting from potential future earthquakes. This damage and loss might occur to buildings, infrastructure, people, or even the environment. Within the risk framework, the focus is on estimating damage and loss for residential, commercial, and industrial buildings (and their occupants) by combining seismic hazard with physical vulnerability and exposure models. In simple terms, a PSRA involves the calculation of seismic hazards, fragility/vulnerability functions for each element at risk, and exposure models, describing the location, building classes, and value of all elements at risk primarily (Equation 1) (Crowley et al, 2018, p.2):

Physical seismic risk = Seismic hazard * Physical vulnerability * Exposure

Exposure term on UNISDR terminology is defined as any subject like people, property, systems, or other elements present in hazard zones contingent on potential losses. Measuring exposure can include the number of people or types of assets in an area, combined with the specific vulnerability of the exposed elements to any particular hazard to estimate the quantitative risks associated with that hazard in the area of interest (UNISDR, 2009). For a better understand of the equation and an overview of the concept, section 2.3 elaborates more on physical vulnerability.

2.3. Vulnerability

In terms of theory, Kelman describes vulnerability as the propensity to be harmed by hazards and, alongside the social processes creating and maintaining that propensity to be unable to deal with that harm (Ahmed et al, 2016). In comparison, UNISDR defines it as is the characteristics and circumstances of a community, asset, or system that makes it defenseless to a hazard's damaging effects (UNISDR, 2009). Through many physical, social, economic, and environmental aspects, vulnerability encompasses many human behaviors and attitudes, decisions, values, and governance. In hazardous situations, harm might be casualties, social and business interruption, and property damage (Ahmed, 2016). If we assess how the country is affected by the disasters, we can walk through the four types of vulnerabilities:

Table 02. Four aspects of vulnerability

Human-social (Singh et al, 2014, p.75) (Flood site, & Samuels, P, 2005) (Ajay et al, 2019) (Tapsell et al, 2010)	.....´The characteristics of a person or group in terms of their capacity to anticipate, cope with, resist, and recovery from the impact of a natural hazard´ .....´the resilience of communities when confronted by external stresses on human health, stresses such as natural or human-caused disasters, or disease outbreaks. ´ …. ´the susceptibility of social groups to potential losses from hazard events of society's resistance and resilience to hazards´.
Physical (Lang and Meslem, 2017, p.2) (Birkmann et al, 2013)	.... ´the probability (or the potential) of a given physical component or element to be affected or damaged under a particular external excitation, e.g., a natural hazard such as an earthquake´ .... ´potential for damage to physical assets, including built-up areas, infrastructure, and open spaces. ´

Economic (Briguglio, Cordina et al. 2009), p.232	.... ´Economic vulnerability is defined as the availability of resources in a country and its ability efficiently to produce the range of goods and services required to satisfy its aggregate demand affecting the imports-to-GDP ratio. ´
Environmental (Kaly, Briguglio et al. 1999), p.10-11 (Sopac, 1999)	...´Events or processes that can cause damage to ecosystem integrity. These include natural and human affairs and functions such as 'the weather' and 'pollution.' ...´The potential impacts of climate events (flora, fauna, ecosystems, biodiversity) are also considered part of environmental vulnerability. ´

As mentioned in section 2.2, earthquake damages comprise all aspects of vulnerability but commonly cause structural damages. Physical vulnerability describes the built environment's ability to withstand the impacts of hazards, including here homes, roads, bridges, hospitals, schools, and government buildings. According to UNIDSR, (2009), structural and non-structural measures can be implemented for risk and preparedness. To achieve resilience and hazard resistance towards disaster risk reduction in building structures, engineering techniques are applied; Some of these measures consist of implementing resistant building codes, law enforcement on land use planning and public awareness programs (UNISDR, 2009).

Overall, the aspects provided in Table 02 give an overview of the basis for a combinatory , holistic approach on the vulnerability terms. The approach helps the researcher and the reader in understanding that vulnerability can be perceived from different aspects. To this research, the aspect in interest is physical vulnerability. To address some of these aspects specific methods and modeling approaches are used. As the authors in Khazai et al, (2015) state to address physical vulnerabilities, approaches addressing damage scenarios and disaster impacts (Khazai et al, 2015).

A study can generate vulnerability relationships by two main approaches. The first approach is based on obtaining damage data (example on the building damages) during fieldwork observations after the disaster. The second approach is based on an evaluation analysis of the affected structures through detailed time-history, building typology, building regulation information (Erdik et al, 2003). In other words, to measure vulnerability, the researcher has to get access to relevant information about the context and the building environment. The information can be related to risk or high degree of exposure, lack of response capacities, susceptibility, and lack of resilience. The causal factors of vulnerability are explained as follows (Birkmann et al, 2013):

- Exposure, which is defined by Khazai et al, (2015) as ´´the predilection of human settlements and the environment affected by a dangerous phenomenon due to its location in the phenomenon's area and a lack of physical resistance.´´
- Susceptibility or fragility described as society's predisposition to suffer harm, resulting in weak or inadequate ´´human settlements and disadvantageous conditions, and relative weaknesses related to physical, ecological, social, economic, institutional, and cultural issues.´´
- The ack of urban resilience or (societal) response capacities are limitations to access, mobilize or implement social-ecological resources of the system and the inability to respond in arresting the impact. In other words, this vulnerability factor comprises the capacity to anticipate, cope and recover in the short term (Khazai et al, 2015).

Suppose vulnerability is seen from a social or anthropocentric viewpoint. In that case, it essentially refers to the propensity of human beings and their livelihoods (these may be analyzed from an individual, family, group, area, regional, national, or international perspective) to endure losses and damages when affected by a physical event and to confront problems in reconstruction and recovery. Therefore, it is very important to analyze different part of the context, including here physical, social or institutional features; to analyze the community and its predisposition to risk or inability to cope o anticipate or recover from the disaster, livelihoods and their susceptibilities or fragilities. From this analysis, it is possible to fully understand vulnerability. Components of Vulnerability include:

- the location of settlements in seismic areas and the size of the population.
- inadequate building practices and regulations (policies and implementation).
- dense concentration of buildings and high occupancy.
- lack of public awareness on earthquake risks and the absence of warning systems (Bozo, 2021)

Hernandez et al, (2018), defines risk as ´´the expected probability of harmful consequences or losses resulting from interactions between natural or anthropogenic hazards and vulnerable conditions, it is the potential occurrence of physical, social, economic, and environmental consequences or losses in a given area resulting from the vulnerability conditions of a social-ecological system exposed to hazards over time. ´´ (Hernandez et al, 2018). However, quoting from Birkman et al, (2013)

´´ In facing and recognizing risk, is necessary to involve and mobilize risk governance, which includes the totality of actors, rules, conventions, processes, and mechanisms concerned with how relevant risk information is collected, analyzed, and communicated and management decisions are taken´´ (Birkmann et al, 2013).

The risk management decisions may include prevention, preparedness, mitigation, and disaster management, risk reduction (Khazai et al, 2015).

Among the damages caused directly to the building environment and economy, earthquakes pose a severe direct and indirect threat to the communities. The building environment is constructed, owned, and inhabited by people who make a range of decisions and choices that shape their level of vulnerability to disaster impacts (Khazai et al, 2015). While some people decide to minimize their exposure to risks by adopting mitigation measures, others choose to ignore the risk and the rule or accept the risks without taking any protective measures.

2.3.1 Building environment vulnerability

While chapters 2.2 and 2.3 elaborate on the risks and vulnerabilities that harm the building environment, this section stresses what constitutes the building environment. Erdik et al. (2003, p.10) describes that risk elements constitute urban areas, buildings, population, lifeline systems, and socio-economic. Settlements and construction sites are the built environment (Erdik, M. et al., 2003, p.10). Building vulnerability comprises concepts concerning physical vulnerability. Building vulnerability is the potential degree of loss or damage given to a building or set of buildings at risk when interacting with a disaster (Birkman, 2014). While Muck et al, (2012) describes physical vulnerability as ´´factors encompass susceptibilities of location and the built environment and can be represented through such factors as the remoteness of a settlement, location, and construction materials and techniques to build infrastructure. ´´(Muck et al, 2012)

For this reason, physical vulnerability is seen as a measure of the possible damage of a building that it is likely to experience harm subjected to ground shaking of specified intensity (Erdik, M, 2003, p.10-11, Muck et al, 2012, p.98). A non- engineered building to withstand earthquakes can be destroyed even by an earthquake with a small magnitude, while a building constructed with the earthquake risk in mind can withstand much larger ground movements. Buildings made from reinforced concrete and wood can withstand stronger earthquakes and are much less vulnerable than brick buildings.

2.3.2 Building code

Building damages from natural hazards (specifical earthquakes in interest for this study) and the building environment vulnerability involves ground factors, building's physical conditions. In order to avoid damages to the building's physical conditions, there is a need to ensure a set of rules and regulations on construction policies. Following the UNISDR terminology:

´´Necessary ordinances or regulations and associated standards intended to control aspects of the design, construction, materials, alteration, and occupancy of the building structures, including resistance to collapse and damage in order to ensure human safety and welfare are called building codes´´ (UNISDR., 2009).

In this light, Ching & Winkel, (2018) describes building code (also referred to as building regulations) as ´´a set of rules that specify the standards for constructed objects such as buildings and no building.´´ In order to obtain a planning permission from the responsible institution, buildings must conform to the code. The main purpose of building codes is to provide safety and protection. When these regulations are put into legislation by the appropriate governmental or private authority, the building code becomes the law of a particular jurisdiction (Ching & Winkel, 2018). Stating its importance, Kelman et al, (2016) writes that drafting building codes in the technical dimension for various materials and construction techniques in which structures will not collapse in high-magnitude earthquakes involves studying long-established knowledge (Kelman et al, 2016). In relation to disaster management, building codes should be adapted to the context, and enforced systematically (UNISDR, 2009).

Kelman et al, (2016) stresses on the fact that enforcing, enacting and monitoring a building code according to the social, technical, and functional standards and provisions while providing adequate training opportunities and accountability for design professionals alongside take much longer and require many resources. There is much more left to solve in these tasks, which are part of development processes linked to education, governance, and social services (Kelman et al, 2016, p.130-131).

2.3.3 Reflection over the presented theory

After introducing the definitions, functions, and related terms that build the theoretical framework of this thesis, it is necessary to reflect upon some aspects of the umbrella concept and vulnerability. Resilience, vulnerability, and the related concepts have some converse characteristics. While resilience and vulnerability can be viewed as separate concepts and processes converging each other, from the concepts discussed in this thesis, the researcher can see it an in inverse proportion relationship between them. As stated by Kelman et al, (2016), ´´in analyzing vulnerability and resilience, care is needed to embrace ideas, literature, and approaches from a breadth of development work rather than a narrow disciplinary analysis´´ (Kelman et al, 2016). In section 2.1, the thesis agrees to keep the term resilience under the definition:

´´The capacity of a system, community or society potentially exposed to hazards to adapt, by resisting or changing in order to reach and maintain an acceptable level of functioning and structure " (ISDR, 2021)

The definition stresses that for a system to build resilience, it needs to learn to resist the impact and adapt to the changes. In order to build an earthquake resilient country in Albania, it is necessary to start from the basic steps to build an earthquake resistance building environment. In this light, this study's interest diverts in some ways from resilience to the concept of resistance. The resilience paradigm was interpreted in vastly divergent ways, however. In the analysis done by McEntire.D, (2005) in exploring disaster reduction concept, the researcher stumbles upon a discussion on terms ´resilence´ and ´resistance. ´ Some scholars settle resilience to hazard mitigation, becoming very similar to resistance

In contrast, others regarded resilience as a precursor or synonym for effective post-disaster operations (Buckle, 2000). Regardless of these differences, the concept of resilience captures the fields of social, psychological, political, and economic variables systems better than resistance. As an example, Mileti prefers to use the term "resilience" to disasters rather than "resistance" because of a sense that "resiliency has a slightly broader, more flexible

connotation" (Mileti, 1999, p. 264). Although resistance is overly optimistic about preventing disasters, the resilience perspective may unwittingly imply that we can only respond and recover. In other words, if resilience is defined as the "ability to recover from or adjust easily to misfortune or change.".. and resistance as "the ability to resist" (Webster, 2021), is it better for the community to "recover from or adjust easily" to a disaster, or do we want them to "resist the disaster? The ability to recover from a hazard, i.e., earthquake, insinuates that one has already occurred, while the ability to resist a hazard means that a community will not allow the inevitable damage from an extreme natural event to reach "disastrous" proportions (McEntire, 2005).

Addressing vulnerability and resilience against earthquakes in Albania should be about learning from history and the past earthquakes, past work done on disaster management, and broader contexts to break out of the average trajectories leading to the normality of hazards. While the past should be taken as an example, no assumption should be made that the present and future are the same. Instead, it ensures that history is considered and integrated into research, policy, and practice (Kelman et al, 2016). Based on the discussed literature, analyzing disaster risk reduction within the urban development, applying a long-term perspective plan, seeks a 'normal situation' in which hazard effects, including those from earthquakes, are less destructive. Keeping in mind this and the definitions presented in Table1, it is understood that urban resilience means the ability to return to a "normal" or steady state after a disturbance. However, this definition falls short after asking the logical follow-up: "Bounce back to what"? In many cases, the pre-disaster conditions are not desirable. To a large extent, in the case of Durres, it includes a more conflict-affected situation; the pre-earthquake system itself was corrupt, weak, and not prepared to handle another earthquake (see chapter 4, 5). To this extent, there is no bouncing back to that, nor is it desirable to 'build back better' on this fundamentally flawed foundation. In this respect, if we seek resilience, we seek something transformative, earthquake resistant, and adaptable (IFRC, 2016)

2.4 Theoretical Framework

Many different frameworks have been developed to systematize better risk factors, different facets of vulnerability and resilience, and the various alternatives of hazard resistance adaptation in years. This thesis uses an improvised conceptualization of the MOVE framework (Power, S.A., 2020). The goal when developing the framework was to provide an overview of the many-sided nature of the vulnerability to the building environment, taking into consideration critical causal factors such as exposure, susceptibility/ fragility, and lack of resilience (lack of response capacities) (Birkmann, J., 2013). The MOVE conceptual framework of this study (see Fig.) underlines the damages caused by hazards, i.e. earthquakes, while vulnerability in its many-sided aspects is linked to societal conditions and processes and the different aspects of vulnerability: physical, human-social, economic, and environmental.

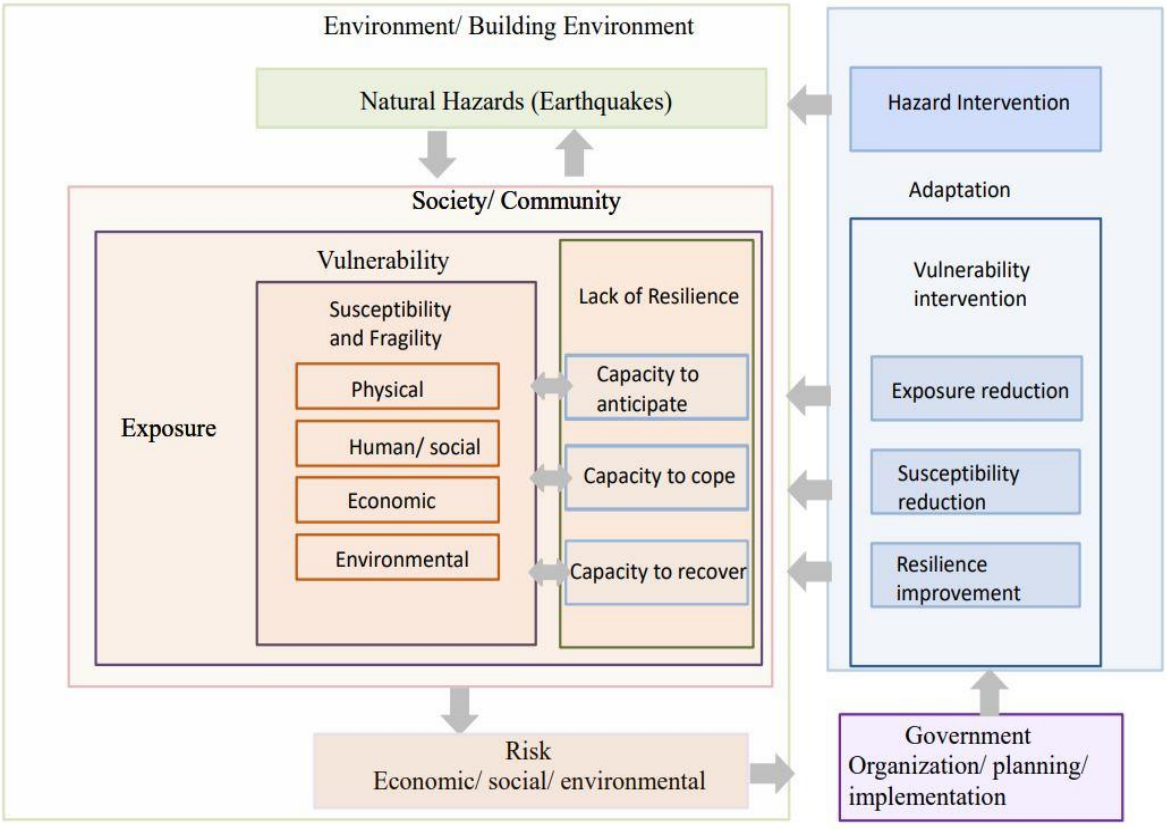


Figure.2-1 Conceptual Move Theoretical framework (Birkman, 2013)

As mentioned, resilience and vulnerability represent two related yet different approaches to understanding the response of systems or actors to change. In connection with vulnerability, resilience would appear to be more obviously related to one of the components of vulnerability, which is variously called adaptive capacity, coping capacity, copying, or capacity of response (Gallopín, G.C., 2006). The outline of preliminary criteria and indicators presented within the MOVE framework show that different terms and elements of the framework can be operationalized within the context chosen for this thesis. However, there are constraints and limits to applying the framework in the case of Durres city. In this regard, a particular emphasis is given to the differentiation of hazard characteristics, such as exposure, susceptibility/ fragility, and societal response capacities (lack of resilience and adaptation) (see figure).

3. Methods

In this chapter, the research methodology of the thesis is presented along with the outline of the research approach (Section 3.1), case study design (Section 3.2), research methods (Section 3.3), and research quality concerns (Section 3.4). The research steps generated by careful consideration of the research questions and the appropriate methods for answering them are substantiated with descriptions. In the theory section (chapter 2), the study combines a literature review with desktop research to foreground the theoretical framework. The chapter that introduces Albania as the big picture case study and Durres city as the central highlight case of the study (chapter 4.) is mainly desktop research, data sourced from a selected collection of trusted media, and evidence deriving from observation. The analysis of the case studies (chapter 5) builds again upon desktop research while applying stakeholder mappings and interview data from three perspectives. The range of methods constitutes a Case Study Research, the methodological backbone of this thesis.

3.1 Research Approach

This study draws upon a qualitative with an adopted retrospective approach, aiming for an in-depth understanding of the causes of massive building environment damages and introducing the concept of building code from institutional/non-institutional and community education perspectives. This research seeks to investigate the issues behind building code as a subjective matter; it strives to collect, integrate, and present data from various sources of evidence. Qualitative research covers broad contextual conditions, starting from the institutional, social, and environmental conditions in people's lives (Yin 1982, p.8-9). The thesis will show an overall observed situation, laying all the facts and existing knowledge followed by theories on the vulnerability of the building environment and the building code under the big umbrella of urban resilience. These theories can help in explaining the problem better and help the situation in developing solutions. Primary and secondary data were carefully collected through observation, documentation, questionnaires, and semi-structured informal interviews. Then the research goes deeper in researching one of these reasons setting the course for three subordinated questions linked to the building resistance to the seismic tremors. Since the quality and validity of the research depend on the process of data collection and the complexity

and diversity of this case is on a large scale, this study uses triangulating to converge the data from the different sources. In this respect, Yin, R.K (1982, p.9) notes: "The convergence will add to the study's credibility and trustworthiness."

This thesis uses abductive study, a combination of deductive (top-down) and inductive (bottom-up) research. Contrary to many types of research, this study starts with an actual concluded situation (the earthquake of November 26th and the damages conflicted to the building environment) with an incomplete set of observations/information. Then it goes to theories that can explain the situation (touching the vulnerability of the building environment and introducing the building code under the big umbrella of urban resilience). So far, it is inductive. The process then becomes deductive to see whether the explanation or theory seems reasonable (Figure 3-1).

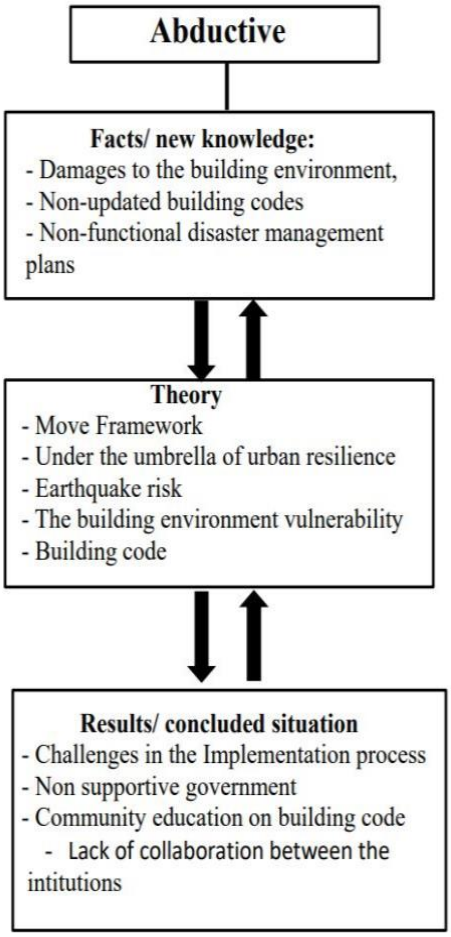


Figure 3-1: Deductive, inductive, and abductive research (by the author)

Unlike inductive research, abductive reasoning is characterized by a lack of completeness in either the evidence or explanation. The method typically begins with an incomplete set of observations and then proceeds to the set's least expected explanation (Gohari et al, 2019, p.72). In Albania, the building environment and the building code are not always seen for the fundamental role they play in earthquake vulnerability. The thesis is aware that abductive research can conclude to incomplete or lack of evidence, but the investigation itself is related to the fact that there are many explanations to this case, as the study itself is considered by three perspectives. As shown in Figure 3-1, abduction starts with considering the existing knowledge over the damages caused by the earthquake, non-updated building codes, and non-functional disaster management plans (Chapter 4/5), particularly observations over the case study. These observations then give rise to a hypothesis (n collaboration with theory, that relates them to some other facts or rules which will account for them. This process involves correlating and integrating the facts into a more general description, relating them to a broader context inside the building environment (Gohari et al, 2019, p.72).

3.2 Case study design

The case study as a research method enables a researcher to closely examine the data within a specific context. Yin (1984, p.23) quotes the case study: "as an empirical inquiry investigating a contemporary phenomenon in a real-life context, where the data examination is conducted and in which the situation has taken place and in which multiple sources of evidence are used." (Yin, 1984, 23), Zainal, 2007, p.2).

3.2.1 Case study of Durres city

The case of Durres city and the earthquake of November 26th is a suitable case to study the building environment's vulnerability and test the concept of building code in Albania. This thesis approach is intrinsic and among the three types of interests: intrinsic, instrumental, and collective. In defining case studies, an intrinsic case study gives the researcher the chance to examines the case for its own sake (Zainal, 2007, p.4). The chosen case study is a particular case, as the earthquake of November 26th is chosen to investigate the building environment in Durres, focusing on unfolding a chain of reasons and processes behind the extensive damages from earthquakes over the years.

This study uses exploratory research to explore, describe, and analyze the background of the hazard, the development under the urban sprawl of the city of Durres, and investigate internal-external influences of the building code in reducing vulnerability in the city building environment over time. Exploratory case studies are set to explore any situation or problem in the data that is of interest to the researcher and help find a problem that was not given enough in-depth study before (Zainal, 2007, p.3). Exploratory research will help understand the problems behind the case more efficiently and determine how and why things happen. Using flexible sources for a balanced and broad comprehension, would benefit the research.

3.3 Research methods

Case study researchers draw their data from multiple sources to capture the case under study in its complexity and entirety. As established in the research approach (see chapter 3.1), this thesis uses qualitative research with a triangulation method strategy.

3.3.1 Observation

As a research method, observation helped the researcher conducting in-depth analysis to reach the aim of the study. Observation has been defined as a systematic description of events, capturing the images, behaviors, and fragments in a social setting for the study by Satria,(2014). During the site visit and the duration of the fieldwork, the researcher had the opportunity to observe the damaged buildings up-close (Figure 3-2), make a general assessment of the building environment in the area, and interact with the residents. Dewalt. and Dewalt. B.R(2002, p.7) see observation as a very important used during fieldwork research. They state as followa, ´it involves active looking, informal interviewing, writing detailed field notes, while observation allows the researcher to notice the nonverbal expression of feelings, determine who interacts with whom. It also allows the researcher to grasp how participants communicate and check how much time is spent on various activities´´. (Dewalt and Dewalt, 2002, p.7, Satria, 2014))

Figure 3-2: Damaged buildings by the earthquake in Durres (by the author)

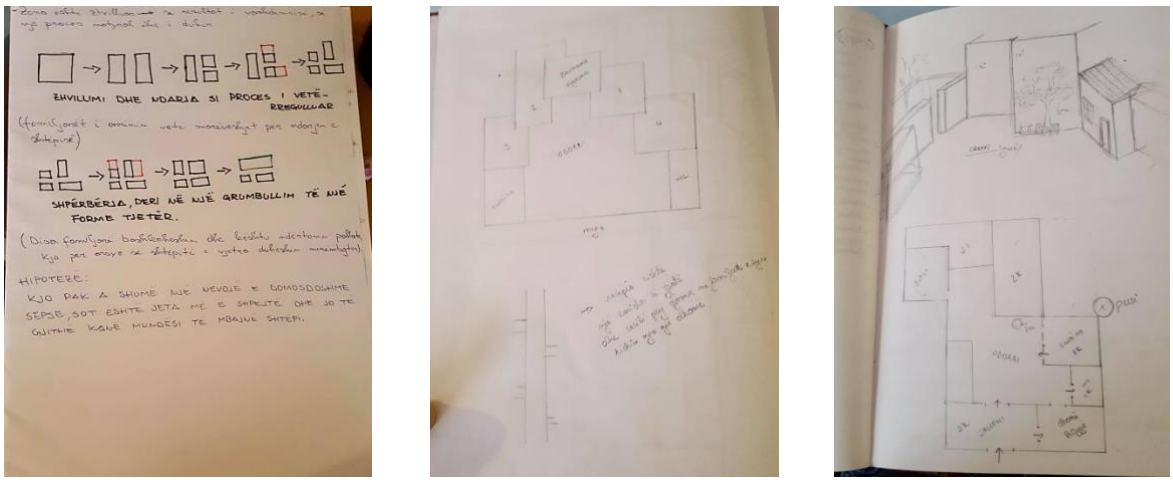


Figure 3-3: Notes and drawings during the fieldwork (discussions over the building typologies and history of construction with the respondents)

3.3.2 Documentation

Documentation in research is a beneficial resource, although the information provided is often open to interpretation (Denscombe, 2021 p.170). The information provided by documents can take many forms and should be the object of detailed data collection plans. These include reports of events; administrative documents, such as proposals, progress reports, and other internal records; formal studies or evaluations related to the case; news clippings and other articles appearing in the mass media or community newspapers. (Denscombe, 2021, p.170). However, documents help verify the information gained from other sources and provide specific details to corroborate information from those sources, such as interviews. Thus, although the documents are not always accurate and may not lack bias, they are valuable sources. This thesis tries to overcome the weaknesses of documentation by using the triangulation technique, to verify or falsify the collected data.

3.3.3 Data Collection

For the literature review, this research has gathered information collected by the studies of other researchers in their formal studies and records or evaluations by the NGOs. The books, articles, and relevant studies are examined via the provided literature in the UEP courses in different semesters, via google scholar using (VPN) of NTNU, and via NTNU University

Library through Oria. Sources were searched under the keywords: urban resilience, vulnerability, building environment, building code, earthquake.

Furthermore, a list of articles published by the Albanian media is used as a relevant source to cover the case study background, the description of the earthquake, and information helpful to the study. Most of the information retrieved from the media has been verified through the interviews and observation on the fieldwork process.

Social media channels have also been helpful tools for research. Through Facebook, Instagram, and Twitter, the researcher could follow the work of NGOs and the government regarding the earthquake.

3.3.4 Interviews

Interviews are chosen as a practical method to understand the individual interpretations and residents' experiences over the earthquake. This thesis uses a combination of questionnaires (provided in the appendix) and semi-structured interviews for two reasons:

First, due to the pandemic, approaching people has been more difficult than ever in Albania. A questionnaire is seen as a formal approach to gain their interest, and then according to their reactions to the questions presented, it opens the discussion—in-depth. Second, most of the population in the country is not educated about the building environment, building code, or terms like vulnerability, contingency planning, or urban resilience. A written sample of the questions containing this information is a better option for the researcher to give them time to process and ask for help when needed. With a combination of semi-structured interviews and questionnaires, the researcher has a clear list of issues address and questions to be answered. Moreover, starting the interview with a questionnaire is more flexible regarding the order in which topics are considered, starting from the simplest things to the complicated ones. Audio-tape recordings were made when allowed to captures the interviews, and notes were taken for the non-verbal communication and visual signals.

The interviews intended to collect the stakeholder's experiences and believes about their knowledge in three base themes: the country's vulnerability against earthquakes, knowledge about the building code, and community involvement in preparedness and disaster risk management. In order to identify the stakeholders, three groups were chosen to get three perspectives for the chosen themes. In-depth interviews have inter-subjectivity itself, which means that the thoughts expressed by the interviewees depend on the kind of interaction between the researcher and stakeholder (Tjora, 2018, p.13). This interaction was also impacted by the coronavirus situation. It was possible to conduct a number of 23 interviews, three of which allowed the researcher into their homes for an in-depth interview, mapping, drawing, and discussion over the selected themes (figure 3-5). Figure 3-4 shows the stakeholder's mapping and the initial plan for the interviews.

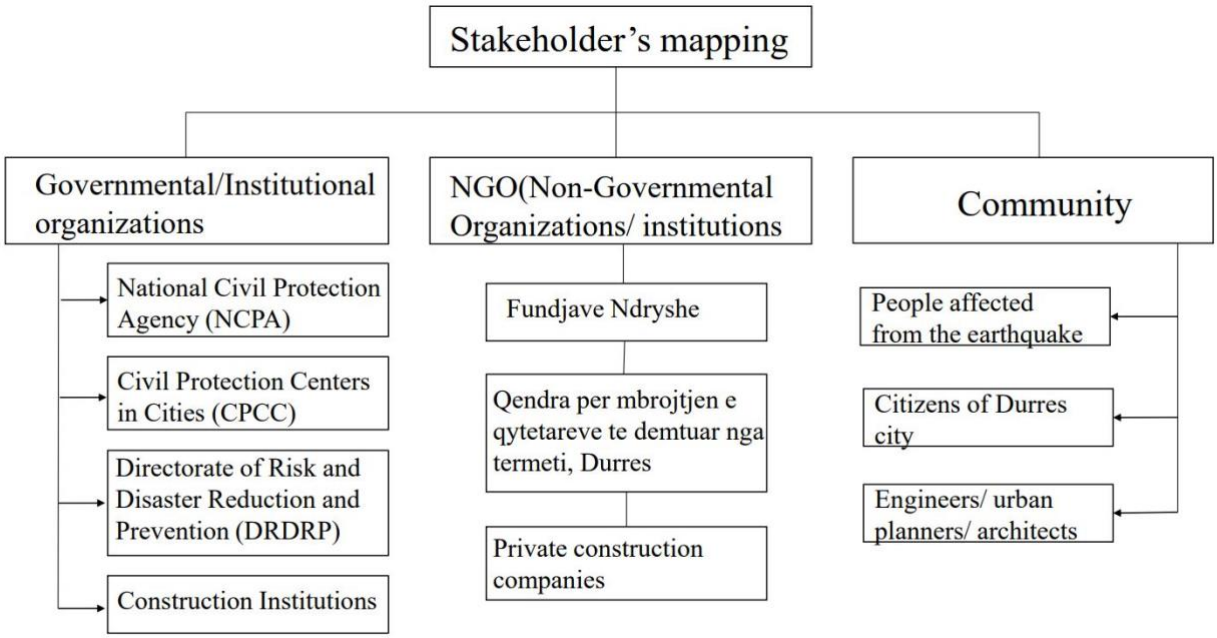


Figure 3-4 Stakeholder's mapping (by the author)


Figure 3-5 Moments from the interviews (discussions on building typologies, building code and damages on the houses)

The research has also followed the snowball sampling technique: Bryman,(2016), p.467, identifies it as ``snowball sampling is a sampling technique in which the researcher samples initially a small group of people relevant to the research questions, and these sampled participants propose other participants who have had the experience or characteristics relevant to the research´´ (Bryman, 2016, p.467). Tjora claims, 'In the case studies, the selection of participants is limited by a natural unity that exists independently of the study' (Tjora, 2018, p.104).

The participants were selected in the original research design due to their experience and expertise in earthquake and building environment vulnerability, construction practices, and community safety principles. However, due to the coronavirus outbreak and other possible reasons, some selected stakeholders did not answer positively to the invitation.

3.3.5 Methodological challenges and Limitations of the thesis

The CoVid-19 pandemic has been a significant obstacle to the conduction of this research. The flight restrictions and the countries' regulations confined the study to a shortened fieldwork time, academic literature, and desktop research. On-site research was essential for this case study, and the researcher for it gives a real-world approach. Although it was possible to conduct some research in Durres, Albania, it has been a challenge to follow up on the initial plan of the fieldwork.

Unfortunately, for many other reasons involved, it was not possible to interview all the stakeholders. Although many attempts were made, no governmental/ institutional organization agreed to a meeting or digital interview. Only one NGO agreed to an interview, and due to CoVid-19, it was not possible to approach as many citizens as a prerequisite.

4. Context of the Research

4.1 Background of the case study

On Saturday, September 21, 2019, an earthquake with magnitude 5.6 hit the northwest region of Albania. The earthquake's epicenter was on the outskirts of Durres and affected a part of Tirana city (Institute of Geoscience, Energy, Water, and Environment- IGJEUM, Albania, 2019, USGS, 2019). The event did not cause fatalities but left behind approximately 110 injured people and 120 damaged buildings without structural failures (IGJEUM, 2019). This was the first event of the seismic sequence, which was succeeded by another earthquake on November 26, in central northwest Albania, with a magnitude of 6.4 (USGS, 2019). The earthquake was felt strongly in Albania's capital Tirana and the cities nearby (Kavaj, Lushnje, Elbasan) (Media sources, Shqiptarja, 2019), and caused a total of 51 fatalities and about 3,000 injured. On the official Post-Disaster Needs Assessment, including direct and indirect losses, it is revealed that the total effect of the hazard accounts for 985 million euros (PDNA, 2020).

4.2 Earthquakes in Albania

Chapter 1.2 introduced how earthquakes have affected Albania over the years (figure 1-1). Albania's territory distribution is mainly related to geological and a not well constrained, controversial tectonic construction in the Alpine Mediterranean seismic belt. USGS (2019) explains that tectonics of the Mediterranean Sea, in the convergent boundary region between Africa and Eurasia, are complex and involve the motions of numerous microplates and regional-scale structures. The Mediterranean region is part of the second most crucial earthquake belt globally, stretching from Sumatra High Week through the Himalayas, Asia Minor, and the Atlantic. This area accounts for about 17 percent of the world's largest earthquakes (USGS, 2019). Figure 4-1 represents the seismic hazard and seismic risk for Europe.

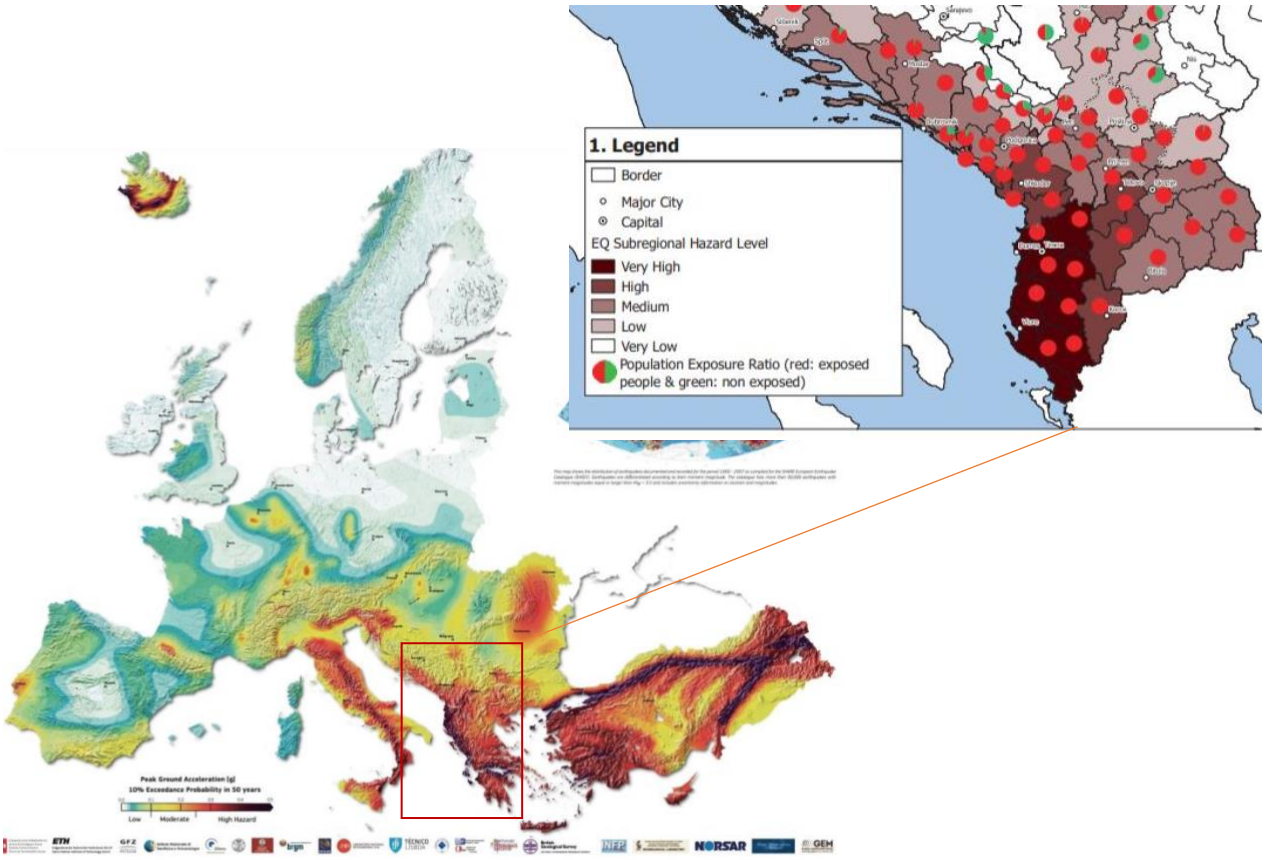


Figure 4-1. The seismic hazard and seismic risk for Europe and Albania (USGS, 2019)

The surrounding coastal area of the Adriatic Sea or the Adria microplate represents one of the most seismic points of the entire Mediterranean basin. Furthermore, being part of the Balkan Peninsula makes Albania a seismic region prone to earthquakes (Muço 2006). In the tectonic summary, USGS writes that the earthquake on November 26, 2019, occurred due to thrust faulting near the convergent boundary of the Africa and Eurasia plates. At the location of this event, the Africa plate converges with the Eurasia plate at a rate of 73 mm/year (USGS, 2019). Therefore, the location poses a risk and does put the country at high exposure.

4.2.1 Earthquakes in Durres

In their research over the seismology on the Balkan area and the historic documentaries review sources, many authors indicated that the city of Durres is probably the most hit in history by earthquakes in Albania and had been destroyed repeatedly by strong earthquakes in the past (e.g., Evangelatou-Notara, 1993; Guidoboni et al.,1994; Papazachos, 1997; Guidoboni, 2005; Ambraseys, 2009; Aliaj et al.,2010). As mentioned in 4.1, the fault stands in the movement of the Adriatic microplate. According to these studies, Durres has been hit by seismic activity since 177 BC, 345, 506 AD, then several times in 1273, 1279, 1869, and 1870. The earthquake of 1273 is considered the most strong earthquake that hit the city and almost destroyed it, while most of its 25,000 inhabitants emigrated elsewhere. Also, in 1926 - 93 years ago - an earthquake with a magnitude of 6.2 and an intensity of 9 points resulted in irreparable consequences in buildings, apartments, and infrastructure in Durres, Kavaja, Shijak, up to some villages in Elbasan (Critikos, 1928). One of the main findings in fieldwork during observation and the deskwork research on various seismic assessments on the November earthquake is that significant building damage was mainly distributed in two areas (figure 4-2). The first area is the port of Durrës and continuing alongside the coastline (Figure 4-2 (1)). The port consists mainly of weak and unconsolidated marshy, alluvial, and coastal deposits, while the coastline consists primarily of residential and function buildings (resorts, hotels, restaurants, bars, and supermarkets).

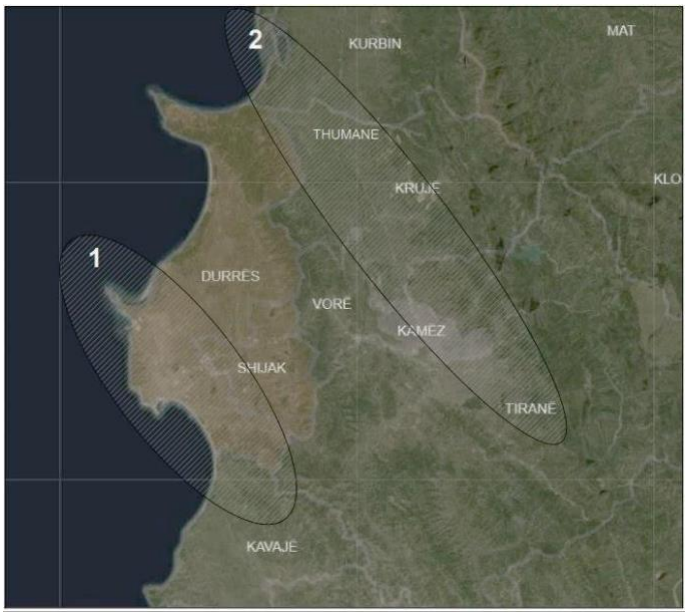


Figure 4-2. The two areas with high building damages (source: Author, worked with Adole Illustrator)

Along the coastal area, buildings sustained heavy structural damage, including collapse and tilting. Several reinforced-concrete multistory buildings damaged the lower three to four floors, although higher floors remained nearly intact. In addition, many residential buildings and hotels collapsed (Figure 4-3). From an engineering geology perspective, Kociu, S. (2004) argues that the city's coastal and upper side plain is composed of thick poor quaternary sediments, with organic and historical layers of the former Durres swamp. In addition, the area was highly susceptible to soil liquefaction; as it was considered one of the most seismic-active regions of the country. During the past and recent earthquakes, the liquefaction phenomen was observed in this area. For example, after the intense December 27, 1926 earthquake, fountains with hot water, sand, and mud volcanoes were observed (Kociu, 2004). An explanation for this might be due to the sandy beaches and lagoons, which are filled mainly by recent quaternary poor sediments (silts and silty sands, sands, and sandy clays, loams). On the contrary, adjacent buildings founded on soil that is not liquefied sustained any structural damage (Papadopoulos, 2020, Kociu, 2004).

The second area of destruction involves part of Tirana city, Kamza municipality, Fushe Kruje county, and Thumane village. According to local authorities, area 2 reported the most fatalities

and the destructed buildings (Media sources, Top Channel, 2019). In his research about seismicity and seismic hazard assessment in Albania, Aliaj.S, (2010) claims the geological setting of Thumanë, Fushe-Kruje, and Kameez, is composed of Pleistocene and Holocene alluvial deposits containing clays, sands, gravels, and boulders (Aliaj et al, 2010).

Figure 4-3. a), b) Damages on Area 1. c) Damages on Area 2. (pictures were taken during fieldwork or given by the respondents)

Apart from the strong-motion earthquake and the geological setting, the building damages observed in both areas could be attributed to several other factors, including poor construction quality, aging of materials, not retrofitting the buildings of the affected areas from the impact of the September 21, 2019 earthquake. (Papadopoulos et al, 2020).

4.3 Building Code

4.3.1 Construction quality

The building typology in Albania attributes to the three construction phases 1945-1960, 1960-1990, and after 1990. A Marxist-Leninist government ruled the country from 1946 to 1992 (Wikipedia, People's Socialist Republic of Albania). Urban planning during these years was as rigid as the communist regime itself. The Regulatory Plan was the main instrument of Urban Planning, a very inflexible mechanism, which consisted mainly of a land-use plan presenting the location of buildings and their function (Janku et al, 2017).

With the end of World War II, housing in Albania was challenged a high number of housing stock were damaged or destroyed. Aliaj, (2003) research on Housing typologies in Albania states that authorities were faced with many challenges after the war, including rapid urbanization rhythms, and further aggravations because of earthquakes. It was essential for them to undertace significant efforts to improve the situation. They starting by building 185,000 new houses/apartments between 1945-1970. In addition, they introduced the prefabricated building systems during the 70s (Aliaj, 2003). Although the seismic code KTP-1952 existed during this time, seismic analysis was unknown, and buildings were primarily designed and constructed based on experience, intuition, and simplified calculation (Bozo, 2021)

Up to 1990, the plot size of housing depended on the planning and regulation normative, local circumstances, context, and the family's ability to afford the cost of building materials. After the '90s, the socio-political changes in Albania were also reflected in the development of the territory in the form of uncontrolled urbanism, in the decline of public spaces, in high-density multi-store buildings in urban centers, and informal in the suburbs (Janku, Allkja et. 2017). Brick, stone, concrete blocks, and reinforced concrete are the most common materials used in construction during these periods. Masonry buildings built before the '90s make up most residential buildings, designed following the codes [KTP-63, 1963; KTP-78, 1978; KTP-89, 1989] (Bozo, 2021).

The housing type in Area 1 and Area 2 (Figure 4-2) consisted mainly of:

- Pre-or post-war detached dwellings, rural or urban detached dwellings; one store dwellings in lowland tradition,

- Low rise flats, up to three or four stories, built-in bricks by mechanized methods,
- Brick-built apartment blocks, constructed by some degree of mechanization and prefabrication, up to five or six stories, built by local stone foundations, with or without concrete (Aliaj, 2003, Bozo, 2021),

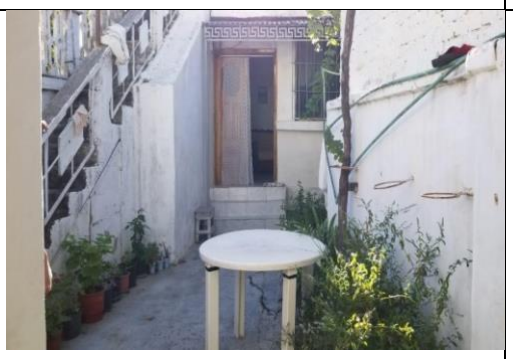
The private housing sector in the areas of interest can be divided into two sub-groups:

- Housing built by the respective authorities following the existing planning and regulations of that time,
- Self-built dwellings. Most of these constructions are built on private initiatives, based on traditional construction techniques, with no engineering projects supported by design codes (Bozo,2021, Durres citizens interviews)

The private self-built housing is also linked to informal settlements in Albania. According to the authors B.Aliaj, S.Dhamo, D.Shutina, (2010), building informally in Albania has passed through a straight line of actions: i) first by building and latter by ii) occupying, parceling, the land portion that surrounds the structure raised informally. At the beginning of the '90s, this process happened following the land sub-urban divisions. (Aliaj et al., 2010). In many cases, following the irrigation canals is the former Wetland of Durres city, named Keneta neighborhood (area 1), and Kamza municipality (area 2) (Laurasi et al., 2021).

Table 03 shows how some buildings in Area 1 and Area 2 can be distributed concerning the construction phases and subgroups. Pictures presented in the table are pre-earthquake and provided by the respondents. The author collected the data about the building year and form of construction during the interviews.

Table 03. Building classification according to the year and the way of construction (By the respondents)

	Self-built private houses	Housing built by the respective authorities
1945-1960	 No implementation of design codes Material: Qerpic	 Design code KTP-52 Material: Prefabricated brick
1960-1990	 No implementation of design codes Material: Brick/ good maintenance	 Design code KTP-78 Material: Prefabricated brick
1990-2000	 No implementation of design codes/ little knowledge over construction regulations. Material: Reinforced concrete	 Design Code: KTP-89 Material: Reinforced concrete

2000-…..	 No implementation of design code Material: Reinforced concrete	 Design code: KTP-89 Material: Reinforced concrete frame system

When asked which buildings are most at risk from earthquakes during the interview, Luljeta Bozo answers that the buildings constructed before the 1960s pose more risk because of the materials used and low maintenance. Still, there is also a high risk for some of the structures built after the 1990s. After the authorities established the national building code in 1989, the security in building construction increased in the 1990s (Bozo,2021). During their field investigation just a few weeks after the earthquake of November 26, the Earthquake Engineering Field Investigation Team (EEFIT) assessed the building stock in Albania. According to this investigation (also verified during the interview with L.Bozo), numerous low-rise buildings were constructed after 1990, primarily until 2000, without permission from the authorities.

Most of the constructions of private dwellings by citizens in Albania after 1991 have been dwellings built by unskilled employees in the absence of planimetry, site permits, and construction permits and have not been controlled by relevant institutions (addressed in Chapter 4, section 4.3.1). *For this reason, the need arose to adopt the legislation based on the needs of the situation, through Law no. 9482 dated 03.04.2006 Amended, "On legalization, urbanization, and integration of illegal constructions," by which most of the illegal constructions were legalized.*

Project coordinator at AWPS, interview session

Owing to the poor law enforcement, illegal interventions were also made to the existing buildings. Such interventions included added floors on the top or side of buildings, openings in the load-bearing masonry walls (EEFIT, 2020).

Low construction quality and misuse of the building code and construction regulations are significant features in earthquake vulnerability. The collapsed or damaged buildings from the earthquakes were from all the construction phases, self-built or from the authorities. The damages were also altered from the materials being too old and weak to withstand the earthquake energy and tremors or buildings constructed without construction permission, not within the planning or seismic protection regulations (Freddi, F., 2021).

4.3.2 Current building code in Albania

Chapter 4.1 and Figure 1-1 showed that Albania had endured several catastrophic earthquakes over the years, which have caused the building environment extensive damages. Due to this fact, the Albanian authorities have created building regulations to have more substantial housing. Over time (especially over the last century), through empirical rules and experiences, the regulations were transformed into complete legal codes for construction, which have continuously grown through significant changes and improvements reflected until the last code of design (KTP-N.2-89) (Guri, 2016). The information presented in this section comes from the official document on Technic Codes adopted in 1989 by the Ministry of Construction and Academic Sciences, Tirana, and research done on the vulnerability of the building environment.

Albania has a long history of code-regulated seismic design (Freddi, F. et al., 2021). Figure 4-4 presents a timeline of the evolution of Albanian seismic codes. The country adopted the first seismic rules in 1952. The 1963 revision increased the requirements for seismic representations, while the 1978 revision did not bring significant improvements. After the 1979 earthquake in Montenegro (Serbia and Montenegro), Albania's new seismic zoning map was approved, with a scale of 1: 500,000 (legal act no. 371 of 1979). During the 1980s, a general revision of the seismic technical rules and new earthquake resistance rules (KTP-N.2-89) came into force in 1989. As technical design conditions KTP-N.2- 89, the relevant Seismic Zoning Map of Albania is in force (Guri, 2016).

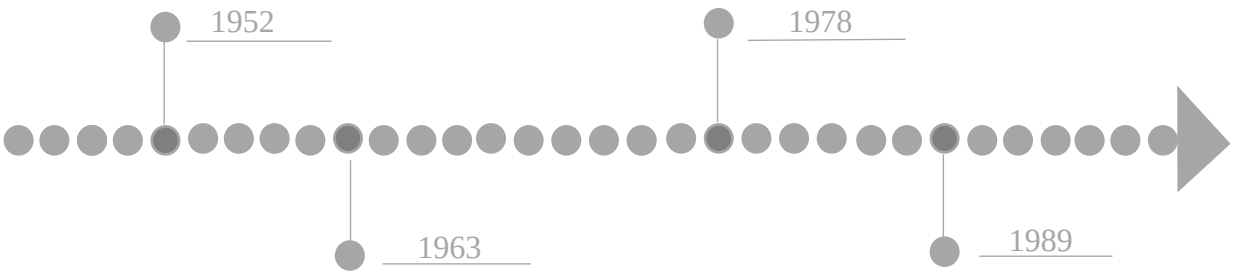


Figure 4-4. Timeline of the evolution of Albanian seismic codes (Freddi, F. et al., 2021)

Observing the timeline in Figure 4-4 and according to the official documents on seismic codes in Albania, an estimation of the seismic protection is made based on the construction phases. In the first phase of the construction, before 1960, seismic protection in buildings was deficient or absent. During the second phase, 1960-1990, low and wholly insufficient level of seismic safety, while after 1990, the level of protection could be designed according to KTP-N.2-89 (KTP-N.2-89, 1989).

The technical design condition, published in 1989, was the last legally approved update of our technical design codes, which was accompanied by the seismic map. According to KTP 1989, the seismic requirements to be applied are mainly provided for construction sites with seismic intensities above VI point.

The calculation of constructions to seismic action is given on the basis of seismic parameters of construction sites with intensity VI ½ up to 9 point. This technical code provides the definitions for the design of structures in terrain with seismic intensity up to iX front, for areas with higher intensities, this condition can not be taken as a reference.

KTP-89 recommends that works be conceived with structural regularity in plan and height in terms of compactness and symmetry, providing for this purpose:

- Such distribution of measures so as not to vary much in height

- Fractures not too pronounced in plan and height

When fractures in the plan or height of a building are pronounced, as well as when adjacent parts of buildings have intersections of different levels, seismic joint separation is recommended in order to ensure structural regularity. Antiseismic joints should be made even in cases where the structure has a large length, regardless of whether they have structural regularity or not. It is recommended to use light construction materials to reduce the weight of the structure (and consequently the seismic force acting on the structure).

The aim is to ensure the spatial work of the supporting structures during the seismic action, as well as to create the conditions for the development of plastic deformations.

The purpose of KTP 1989 is that, in case of earthquakes, people's lives will be protected, damages will be limited. Construction structures that are important for civil protection will remain functional (operational).

According to this condition, the calculation of constructions is done by estimating the seismic risk on the basis of the fronts. According to the Albanian Codes for ordinary buildings, the occurrence of a strong earthquake in 100 years is taken into consideration.

4.3.3 Eurocode

Eurocode is the European standard design of structures for earthquake resistance. The updated version of the Eurocode 8, EN 1998-1:2004, includes general rules, seismic actions, and rules for buildings protection. In addition, the program comprises standards generally consisting of basic structural design, needed measures to perform on structures, design of concrete structures, steel structures, composite steel and concrete, masonry and timber structures, geotechnical and structural design for earthquake resistance, and design of aluminum structures (EN 1998-1, 2004).
In European Normative Practice (EC8) as the recommended value for the frequency of the design seismic action or the highest design earthquake is given the repetition period 475 years. This means that, when built, it is taken into account that the building withstands an earthquake that falls once every 450 years. The maximum possible earthquake can be considered an earthquake with a period of 1000 years. There are also recommendations to select it with intensity 2 times greater than the design earthquake.

The Eurocode (EC8) for this earthquake, as well as for the relevant design criteria has no specific definitions. It can be considered that the observance of the specific constructive supplementary measures contained in this Eurocode helps for a possible coping with such an

eventual earthquake, but it is unlikely to happen. Structures in seismic regions according to Eurocode 8 must be constructed in such a way as to meet certain criteria.

4.3.4 The main principles of antiseismic designs in EN 1998-1

In seismic regions, structures must be designed and constructed in such a way that, with the necessary degree of reliability, that the following requirements are satisfied:

- For the non-collapse requirement, the structure must be designed and constructed in such a way as to withstand seismic design action without suffering local or global collapse while maintaining structural integrity as well as a residual bearing capacity after seismic activity.

Notes. The requirement of no collapse corresponds to the situation when there is significant damage to the building, but there are still structural reserves, compared to the state of a total or partial collapse. The structure is considerably damaged, with relatively low solidity and stiffness remaining and the vertical elements are still capable of withstanding vertical loads. The non-structural elements have been damaged, however the partition and filling walls may not have gone out of their function. Permanent average permanent displacements are present. These injuries can cause injuries to people, but the risk of life-threatening injuries is low. The structure must withstand (moderate) post-earthquake aftershocks of moderate intensity. The structure has high repair costs or is likely to be inefficient to repair. Thus, for ordinary buildings, this requirement must be met for seismic action with a 10% probability of occurrence in 50 years or an earthquake recurrence period of 475 years.

-

- For the damage limitation requirement, the structure must withstand a seismic action with a probability of occurrence that is more significant than the design earthquake without suffering damage and corresponding functional limitations. The cost is very high compared to the cost of the design structure itself.

Notes. Frequent earthquakes with relatively low intensity in terrain tremors should not interrupt the use of the object after their occurrence. This level corresponds to the situation when structural damage is limited and the main resistance system of vertical and horizontal forces

has basically the same characteristics and capacities as before the earthquake. The structure does not need any reinforcement measures. It can be used immediately. Thus, for ordinary buildings, this requirement must be met for seismic action with a 10% probability of occurrence in 10 years or an earthquake recurrence period of 95 years.

- Structures should have regular and straightforward shapes in plan and height, and to achieve this, when necessary, the structure is divided by seismic joints into independent dynamic units.
- To ensure a ductile and dissipative global behavior, amorphous destruction of the structure or premature formation of statically unstable schemes should be avoided.
- Since the seismic behavior of the structure depends a lot on the behavior of its elements or critical areas, their details should be done so that during its cyclic loading, the ability to transmit forces and extinguish seismic energy is provided. Therefore, special attention should be paid to the detailing of the joints of the structural elements.
- The analysis should be based on an appropriate structural model, and if necessary, should take into account the impact of deformability of soils and other non-structural elements and other aspects such as the presence of other structures neighboring.
- The foundations must be strong enough to transmit the superstructure loads on the ground as evenly as possible, and their inelastic damage must be avoided (EN 1998-1, 2004).

5. Case Study Analysis and Findings

The study aims to answer the following research questions: 1) What is the building codes' impact on society's vulnerability to seismic hazards in Albania? 2) How is the process of disaster management and post-earthquake reconstruction organized and implemented? 3) How can the country generate good practices in lowering building environment vulnerability and building resilence? Drawing on the literature review (Chapter 2), this chapter sheds light on the impact that building codes have on the vulnerability of Albanian society and how earthquake risk has been addressed under the big umbrella of urban resilience. Therefore, the chapter divides into three sections. In the first section, the institutional perspective is investigated, including the governmental institutions and the private construction companies, where intensive desk work research is integrated with the respondents' interviews. Section two shows the NGOs' view on disaster management and their work with the community. Special attention is given to the participation and extensive work Fundjave Ndryshe Organization (FNO) has done in the reconstruction project to support the affected families by the earthquake. Finally, section three analyzes the community perspective, focusing on their knowledge about earthquakes, building, and seismic codes. An in-depth case exploration of the timeline and construction phases of the houses of three respondents supports this analysis.

5.1 Institutional perspective

5.1.1 Institutional Role on Disaster Management

For the information used in this section, an in-depth investigation is made to the reports, legislation, and posts provided on the official website of The Ministry of Defense of Albania. According to this information, in natural or other hazards in Albania, the initial capacity to assess the situation is the affected local government unit. If the resources of the affected local government unit are insufficient to cope with the situation, additional capacities are requested from neighboring local governments. In the condition that the capabilities of the local governments are inadequate to cope with the problem created by the hazard, the commitment of other state capacities is required, including the State Police and the Armed Forces, according to the provisions of the new law no. 45, dated 18.7.2019 "On Civil Protection," DCM (Decision of the Council of Ministers) no. 747 and regulations in force (ALAA, AAM, BtF, 2020). Figure

5-1 shows the institutional structure responsible for disaster management according to the official website of the Ministry of Defense of Albania.

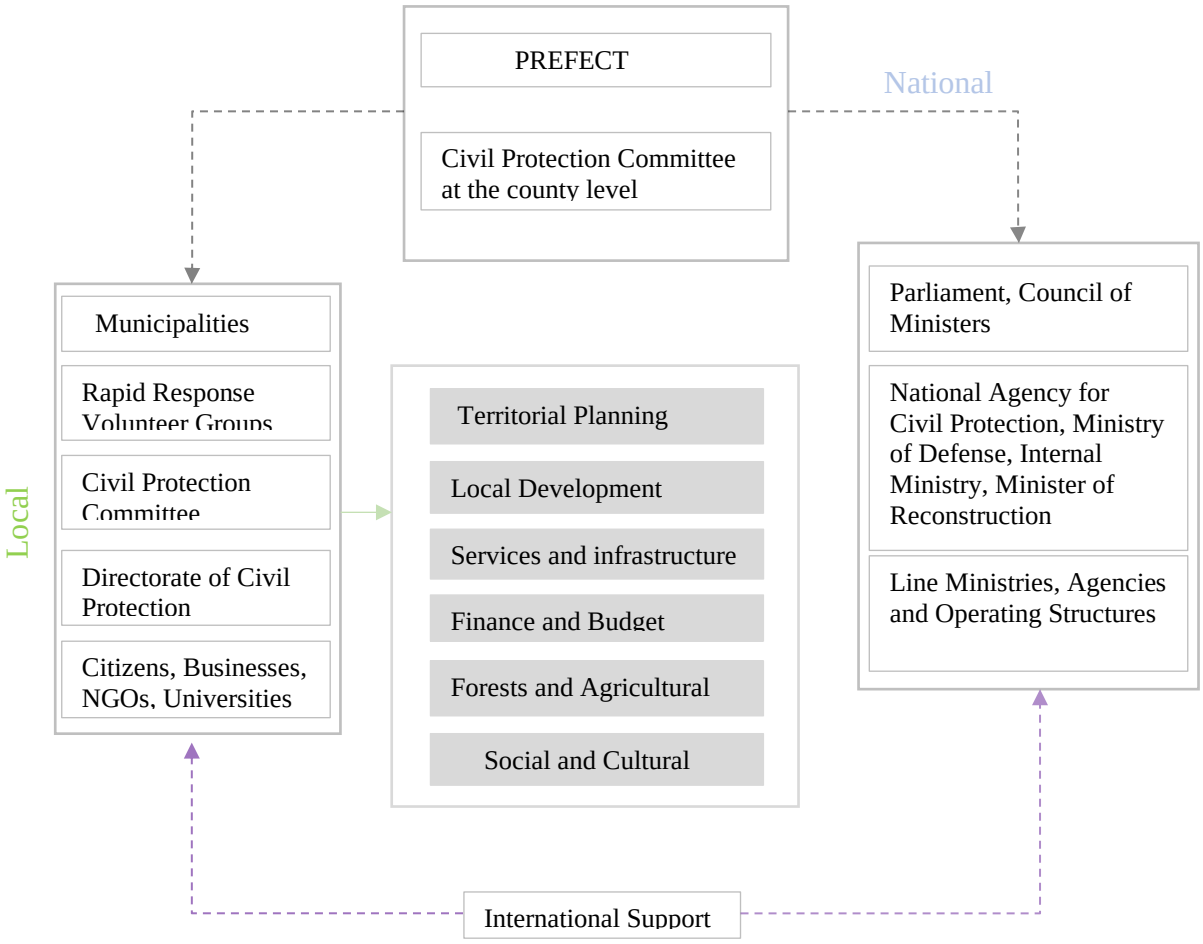


Figure 5-1. Institutional Structure of the responsible authorities on Disaster Management (Diagram created from the author with data from Ministry of Defense, 2021, Albania)

The researcher makes a general interpretation according to the structure and the information provided by the Ministry. When dealing with civil emergencies and crises, the District Prefect addresses the Minister of Defense for the engagement of the emergency plan and the Armed Forces units and requests support for coping with civilian tasks. The Prefect also sets up the working group with territorial branches, the local government units, and other institutions operating at the regional level. The Council of Ministers approves and ensures disaster risk reduction and civil protection policies and adopts the National Strategy for Disaster Risk

Reduction, the National Civil Emergency Plan, and the risk assessment document at the central level. The Minister responsible for civil protection (Ministry of Defense) determines the instructions and strategic objectives; develops and oversees the implementation of disaster risk reduction and civil protection policies; informs the Council of Ministers on disaster risk reduction and civil protection (Figure 5-1) (Ministry of Defense, 2021).

The municipality's role and response separate into two branches. In the immediate response, its role is to operate on the local level to prevent or minimize the consequences of a natural disaster by evacuating people in high-risk areas from their homes at risk of collapse; distributing tents, blankets, food, beds as the first aid in the first moment of the disaster according to the needs of people affected by the earthquake (Durres Municipality, 2021). Municipalities' general role in disaster risk reduction and civil protection is ensuring civil security. They are also responsible for avoiding administrative contraventions, strengthening, inspection, and monitoring the implementation of regulations and acts of local self-government units in their local jurisdiction according to legal provisions. Other tasks to be handled concerning the civil protection function include conducting a risk assessment in their territory, drafting and updating a disaster risk reduction strategy, approval and updating of the local civil emergency plan, organization of training activities in the field of civil protection, ensuring the functioning of the monitoring system, early warning and alarm system in their territory, creating a database of losses from the disasters for the part of the municipality, investment in disaster prevention, protection and rehabilitation, assessment of damages caused by disasters, and cooperation with neighboring cities to implement tasks related to disaster risk reduction and civil security.

According to UNISDR definitions on disaster risk reduction (2009), p.10–11, explained in chapter 2.1.2 of this research, the practice of reducing disaster risks goes through systematic efforts in analyzing and managing the factors of disasters, including through reduced exposure to hazards, lessened vulnerability of people and property, wise management of land and the environment, and improved preparedness for adverse events (UNISDR, 2009).

The research concluded that the committees presented in Figure 5-1 were set up under previous legislation. Currently, cities use previous bylaws, which remain in force until new acts are

adopted. Especially after the November 26 earthquake, municipalities rushed to renew their legislation. After the earthquake of November, the Government established a new law named Law no. 45/2019, "On Civil Protection," and decision no. 750, dated 27.11.2019 "On the declaration of the state of natural disaster in the regions of Durrës and Tirana" Inter-Ministerial Committee of Civil Emergencies, in implementation of the measures taken after the declaration of hazard in the region of Durrës and Tirana (Legislation, Ministry of Defense, 2021). The composition and effectiveness of these committees vary from municipality to municipality, based on risk exposure. The cities that face the risks have better cooperation or engagement with the local civil protection committee. However, the effectiveness of collaboration depends on the financial means and equipment needed to respond to disaster emergencies and technical knowledge of response and mitigation actions (ALAA, AAM, BtF, 2020).

5.1.2 National plan for civil emergencies

The National Plan for Civil Emergencies (NPCE- PKEC in Albanian), approved by DCM no. 835 on December 3, 2004, is the main policy document of the Albanian state in the field of Civil Emergencies (Ministry of Defense, 2021). The form reflects the experience of several possible risk phenomena, capacities, and difficulties in coping with civil emergencies in Albania; it summarizes information, which describes the most critical factors and roles of all institutions and structures involved in all phases of civil emergency management. The information below derives from the official report of NCPE. By bringing together and clarifying the roles and responsibilities of all institutions, state structures, and civil society, NPCE aims to:

- To alleviate and rehabilitate any damage affecting the population, living thing, property, and the environment by civil emergencies.
- To provide conditions for state institutions, public and private, for economic activities and the population, for the transition from the normal state of living and working to an emergency, with the most negligible losses for maintaining order, for the lives of people, for living things, for property, for cultural heritage and the environment, for the effects of a civil emergency.
- To guarantee the use of all possible state resources for public safety, continuous preservation of the national economy, localization of the emergency, zone, and mitigation of the consequences.

The main goal is facilitation in the long run, and NPCE is projected as the necessary path to achieve this goal. The drafting of the NPCE in Albania has been undertaken based on a legal basis, referring to law no. 8756, March 26, 2001, "On Civil Emergencies." Among factors to consider in prevention and facilitation concerning earthquakes, NPCE recommends:

- Investments, coordination, and awareness campaigns of institutions and the general public encourage risk mitigation and reduction.
- Improvements, acceptance, and enforcement of building codes and standards to withstand seismic tremors reduce damage to people and private and public property.
- Preventive and preparatory measures also reduce potential damage to supporting infrastructure (health facilities, main public buildings, roads, railways, airports, water supply systems, energy, etc.), which will be very important for coping and recovering from a seismic shock.
- New constructions of particular importance in areas endangered by seismic shocks should be done so that they withstand stronger seismic shocks than required by standard codes, and such a thing is worth the investment. Moreover, this investment is cheaper than upgrading existing structures.
- Awareness of structures at the local and national levels is vital to bringing together different actors, raising awareness, and developing strategies for implementing existing codes to improve them (NPCE, 2004).

The research concluded that NPCE, as the primary document of the Albanian state policies in the field of civil emergencies, for a long time has not had any update to reflect the changes that occurred during this period in the functions, capacities, and structures that coordinate actions. These changes also include legislation as the plan is based on law no. 8756, dated 26.03.2001, "On civil emergencies," which, together with several bylaws supporting NPCE, have been repealed (Ministry of Defense, 2021). The document includes necessary measures and recommendations to be taken in case of earthquakes, as the improvements and enforcement of the building codes. Still, the implementations of these measures have not taken place. Albania continues to work under the KTP-89 building and seismic codes (section 4.4).

Apart from the international organizations and initiatives taken from them in conducting a risk analysis, disaster risk reduction assessment, and strengthening resilience (mentioning here

UNDP), there have been no such initiatives taken by the Albanian institutions during this document, and the law has been established.

5.1.2.1 The National Civil Protection Agency

The National Civil Protection Agency (NCPA) was established and operates based on Law no. 45, dated 18.7.2019 "On Civil Protection," DCM no. 747, dated 20.11.2019 "On the organization and functioning of the National Civil Protection Agency," as well as the Order of the Prime Minister no. 27, dated 3.2.2020 "On the approval of the structure and staff of the National Agency for Civil Protection," as a structure responsible for reducing the risk of disasters and civil protection, throughout the territory of the Republic of Albania (The Assembly Of The Republic Of Albania, 2019, Ministry of Defense, 2021). The National Agency for Civil Protection is a central public legal entity under the responsible Ministry (Ministry of Defense) for civil protection and responsible for reducing the risk of disasters and civil protection throughout the territory of the Republic of Albania. NCPA exercises coordinating, organizing, leading, technical, supervisory, and controlling authority in disaster risk reduction and civil protection. NCPA is classified as the general directorate at the central level. In contrast, at the local level, it is organized on a regional basis, according to the civil protection centers in the region. Inside the Structure of NCPA function a line of directorates, sectors, and regional centers, which purpose is to work together to reduce the risk of disasters (Ministry of Defense, 2021).

The current civil protection law also embraces the concept of resilience, which is a new approach in the country's legislature. Unfortunately, the agency does not possess an official website, and it is challenging to get in touch with it, but it was possible for a digital interview through connections. From the interview, it was derived that the agency’s plan on dealing with civil emergencies depends on four phases; i) prevention and relief, ii) preparedness and protection, iii) response, iv) return to the normal state (a conceptual diagram is made following these phases to understand better the process that the agency intends to follow) (figure 5-3).

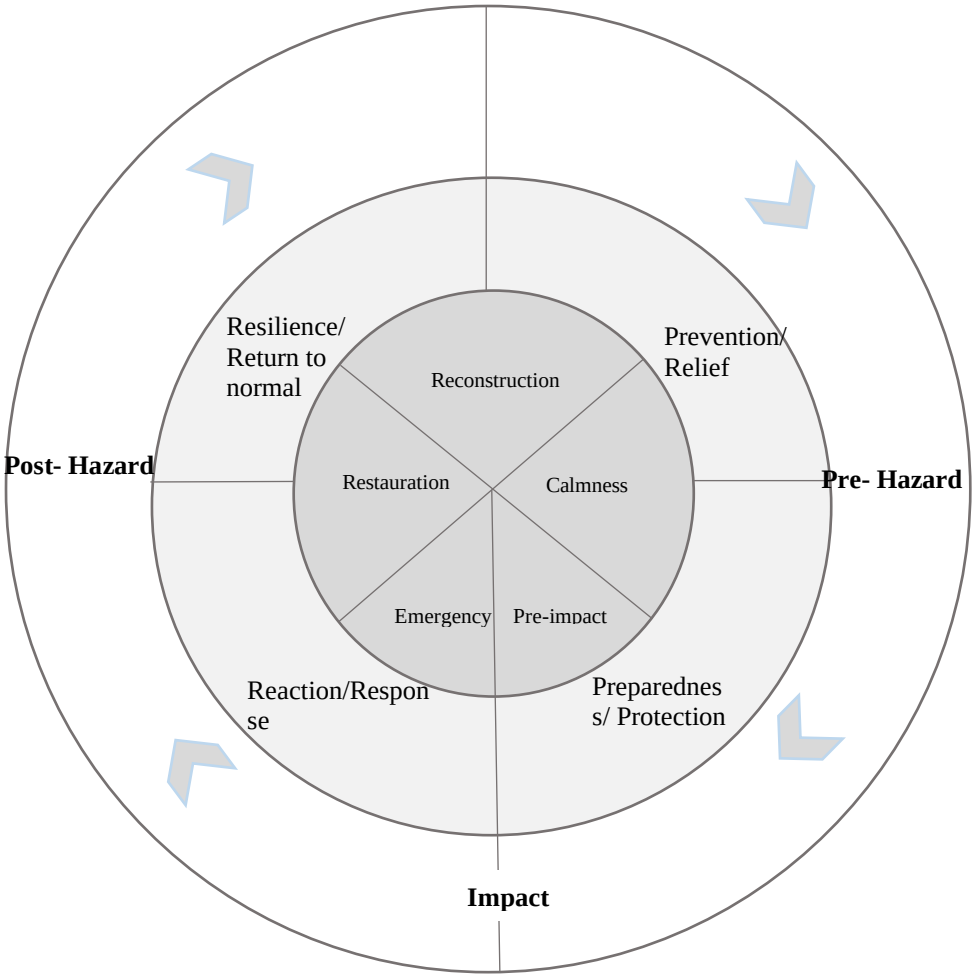


Figure 5-3. Conceptual Diagram. NCPA´s s plan for civil emergencies in Albania. (created by the author based on the interview with NCPA).

There are many measures taken to execute this plan. In cooperation with UNDP Co-Plan (NGO, Institute for Local Development), and the Municipality of Lezha, NCPA and other local Civil Protection structures have launched a pilot project on "Capacity building of disaster risk management at the local level in Albania." In the framework of this project, training with responsible facilities is necessary.

The main objectives for the project were:

-Integration of strategic activities and capacities in the development plans of the Municipality

-GIS risk and disaster assessment

-Civil emergency plan in the Municipality of Lezha

The project in Lezha Municipality is a pilot project, which will then expand to other municipalities. The agency´s focus since it was created has been necessary investment in the

infrastructure, compensation for families affected by disasters, and coping with the Covid-19 pandemic situation.

´ When the agency first was established, we were confronted with many obstacles. Besides the damages from the earthquakes, the situation was aggravated by floods and the pandemic. During 2019 and most of 2020, we did not have the necessary resources to conclude risk assessments. NCPA did not own or administer its information technology systems and network infrastructure. For 2019 there have been continuous fluctuations in human resources, accompanied by vacancies in some of the important positions in the relevant departments. This action carried the risk of non-compliance with the main tasks and functions of the Agency. The newly approved structure of NCPA has foreseen the GIS, IT, and Publication Sector in the Directorate of Education, Training, and Information Technology. This structure, as at that time it was still in the process of restructuring and recruitment, had not been completed with IT, staff/specialists.´

Specialist, Press, Communication and Public Relations Sector, in NCPA

Regardless, NCPA has continued its work thanks to the mobilization and nationwide social, institutional commitment, and the unconditional assistance of international partners. Several international organizations have started resilience concept-based projects in Albania, like UNDP (United Nations Development Program), DPPI SEE (Disaster Preparedness and Prevention Initiative for South Eastern Europe), and GFDRR (Global Facility for Disaster Reduction and Recovery) (NCPA, 2021).

´Work continues to be done intensively in rehabilitating the consequences of this earthquake. Almost all the affected areas have already been turned into construction sites for collective and individual housing and especially the reconstruction of educational facilities wherever they were located. Intensive work is being done to identify and assess the risk, and precisely in the framework of this reform, the drafting of the National Strategy for reducing the risk of natural disasters is being done.´

Specialist, Press, Communication and Public Relations Sector, in NCPA

The principal objective of the institution remains increasing the capacity of municipalities to collect, manage and maintain risk management data at the local level. NCPA´s activity will be strongly linked to national-level databases and institutions and strengthen disaster risk and loss information at the national level. For this project to succeed, training with 61 municipalities to prepare a guide for data collection and management at the municipal level will help manage disaster risk.

´After the enactment of the law, the responsibility according to the principle of subsidiarity has been defined and delegated according to the field of commitment to local government units and institutions responsible for measures, investments, and risk reduction from natural hazards, as well as the establishment and consolidation of the Civil Protection system. Municipalities are expected to invest 4% of the budget as a dedicated fund to address risk reduction and capacity building. The law is quite clear about this obligation not only for municipalities but also other institutions. Furthermore, the law has clearly defined the penalties if there are cases of contracting companies that do not comply with the contracts, they will have to respond legally.´

Specialist, Press, Communication and Public Relations Sector, in NCPA

In addition, measures are also taken to design education programs in disaster risk reduction, civil protection, and inclusion. The NCPA also stated that, in cooperation with the Ministry of Education, after the earthquake of November 26, 2019, they have taken measures for the community to recognize and cope with a situation like an earthquake. For example, they have created a corner in every school that talks about earthquakes, leaflets, and educational classes.

Summary and Recommendations. The civil emergency system in Albania has evolved over time but not linearly. Progress has been accompanied from time to time by pauses and even steps back. This fact, as well as the lack of sufficient data, make its analysis difficult. The National Civil Plan for Emergencies, 2004 (NCPE-04) was a critical step that laid the groundwork for this process. Several projects sponsored by the World Bank, UN, and EU between 2010- 2014 (UNDP Albania, 2021), followed the NCPE, emphasizing that evaluation

and capacity building were necessary steps forward, providing vital information on how this system works in Albania.

The post-earthquake policy-making measures in disaster management focus on resilience, which has already become a guiding concept for spatial development in the country. Chapter 2.1.1 discusses some definitions of resilience and how it can be achieved by working on emergency response and implementing strategies involving institutions and organizations. Although the concept of resilience has evolved through time and has various definitions, one thing that is convergent in all cases is the ability of a country, the authorities, and urban systems to withstand (resist), adapt, change and recover after a crisis (World Bank, 2015, Fera, 1997).

Meanwhile, as mentioned, several international organizations, like UNDP (United Nations Development Program), DPPI SEE (Disaster Preparedness and Prevention Initiative for South Eastern Europe), and GFDRR (Global Facility for Disaster Reduction and Recovery) (NCPA, 2021) in cooperation with NCPA have started resilience concept-based projects in Albania. This project has selected the Municipality of Lezha as a pilot, where work has already begun drafting a civil emergency plan based on the new legal criteria. Revising the information given by NCPA in the digital interview and following their work through social media, the researcher has concluded that the institution places a strong emphasis on action in the post-crisis response. However, on the other hand, crisis preparedness initiatives were few and far between. So the very logic of the institution's objectives, also based on the previous institutional tradition of crisis response in Albania, pushes more towards post-crisis response than addressing vulnerability and risk reduction. The actions and measures taken towards resilience strengthening in the pilot project do not involve building environment vulnerability assessment or strengthening building codes in earthquake preparedness.

From the desk work research and interview with the NCPA, it was concluded that NPCE, being the primary document of the Albanian state policies in the field of civil emergencies, for a long time has not had any updates to reflect the changes that occurred during a long period (2004-2019 earthquake- 2021) in the functions, capacities, and structures that coordinate actions in the field of civil emergencies by not adapting to reality with the events that have occurred for 17 years in Albania. The plan is based on law no. 8756, dated 26.03.2001, "On civil

emergencies," as amended, with the entry into force of the new Law no. 45, dated 18.7.2019, together with several bylaws supporting NPCE, have been repealed.

The researcher recommends that NCPA and MoD (Ministry of Defense), in cooperation with the constituent structures of civil emergencies, need to take measures to update and approve the National Plan for Civil Emergencies to reflect the changes that occurred in the functions, capacities, and structures that coordinate their actions in the field of civil emergencies also based on the changes that happened with the legal and sub-legal basis. On their Facebook page, NCPA writes that the drafting of the plan has already begun, although the process has been relatively slow related to the country´s vulnerability.

The new law and the establishment of the NCPA was a significant improvement step taken in disaster management, integrating the facilities from emergencies to protection (Figure 5-2, 5-3). This step constitutes a new conceptual review; it emphasizes disaster prevention and preparedness towards risk reduction. However, although progress has been evident, there is room for improvement. In the measures taken in disaster management, there is little attention given to the building environment vulnerability. Researchers, universities, the Council of Ministries, and International Organizations have conducted building vulnerability assessments separately. They have concluded that the building environment poses a large scale of vulnerability for the country, critically for the west coastline (Freddi et al., 2021, PDNA, 2020, Polis University, AUA, Co-Plan, 2019, EEFIT, 2020, Guri, 2021). The damages caused to the buildings by the earthquakes in 2019 emphasized the the high seismic vulnerability the area was in, the ineffective law enforcement in the construction process, unauthorized structural interventions, and the necessity for an upgrade of the current building code. Physical vulnerability is not addressed by the Government or responsible institutions, except in the discussions about the building damage caused by the earthquakes. In the current NPCE (2004), the advised measures to prevent damages highlighted the improvement and enforcement of the seismic codes. However, as mentioned before in section 5.1.2, the respective authorities did not implement these measures correctly.

The vulnerability of the building environment is an essential issue to address by the Governmental Institutions in a high seismic activity country. Cooperative efforts of local

governments with the construction companies should make an official assessment of the building environment vulnerability and an official assessment estimation on the damages of the building environment caused by the earthquakes of November. Freddi et al. (2021), the Construction Institute (2021), Polis University, AUA, Co-Plan (2019), EEFIT (2020), Guri (2021), and other volunteer professionals have done inspection reports on the damages on different areas of the affected cities. Still, there is no official document but rather statements from the Governmental Institutions on the media on this matter. Having an official damage assessment report that includes every building damaged constitutes an important step towards identifying vulnerability. The report can be used to analyze which buildings need to be retrofitted, destroyed, or need special attention on maintenance (specifically old buildings that have survived from the damages but need to protect in the case of future hazards).

An important point the researcher sees as problematic in the planned process and phases of the NCPA is the concept of resilience they have chosen to follow. The agency´s official Facebook page highlights the necessity and vision of returning to the normal state, consequently, also confirmed in the interview session. At this point, the researcher is tempted to ask the question: What is normal in the context of Albania? If the ´normal´ refers to the pre-hazard situation, it is back to an unsatisfactory condition. For reasons discussed in chapters 4 and 5.1, the pre-earthquake system itself was weak and unprepared to handle another earthquake. To this extent, as discussed previously in Chapter 2 (section 2.3.3), bouncing back is not always the desired outcome. In this respect, if we seek resilience, we seek something transformative, earthquake resistant, and adaptable (Sanderson, D., Sharma, A., 2016) to 'build back better' on this fundamentally flawed foundation.

5.1.3 Post-Earthquake Reconstruction Program

The data in this section derives from the information, decrees, and reports on the official websites of the Ministry of Defense, Internal Ministry (IM), the Council of Ministries, and the Ministry of Reconstruction. On 16.12.2019, the Normative Act No. 9 was announced, "On Coping with the Consequences of Natural Hazard," and the Ministry of State for Reconstruction is established, decreed on 13.12.2019 by the President of the Republic. The

Government collected the funding for the reconstruction project through budget reallocations, donor commitments, loans or grants from multilateral, bilateral agencies, and private sector contributions (Council of Ministers, 2019). The importance of this section and the relevance of the project for the research is because this step taken from the Governmental Institutions consists as one of the first steps in the right directions in building urban resilience.

The Government has divided the reconstruction program into five sub-programs: (i) construction of new buildings and separate housing units; (ii) restoration of existing buildings through grants; (iii) the social housing fund; (iv) reconstruction of public facilities and infrastructure; (v) social and economic recovery measures (Ministry of Reconstruction, 2020).

The Government approved financial assistance plans for citizens, according to the damage suffered. The application to benefit from the donations for the reconstruction of individual houses was made by the beneficiaries directly to the responsible structures of the local self-government unit where the state of the natural hazard was declared (Ministry of Interior, Ministry of Defense, Ministry of Reconstruction, Durres Municipality Official websites, 2020).

The Government initiated the new reconstruction project of the affected areas by the earthquakes in cooperation with National Agency for Territorial Unification (NATU) and National Housing Agency (NHA). The project uses 398 hectares of reconstruction areas, in which will be developed 7981 apartments in collective housing and 806 individual housing, including public buildings (Ministry of Interior, 2020). Except being an indicator of the size of this project, the high numbers of structures that are planned to be built weigh a lot on the fact that the number of buildings considered uninhabitable and in the necessity to be demolished is exceptionally high.

The Prime Minister presented the project to the public and the Minister of Reconstruction and the Minister of Culture, where they gave all the work and all the commitment undertaken for the reconstruction process, which is not focused only on personal solidarity but is extremely widespread throughout the territory (Council of Ministers, 2020).

The need for individual houses has already been designed based on three models of housing. Housing models are closely related to the number of families, which will be accommodated in the models of individual typologies. The models are designed precisely, considering that housing should be more easily built, should be 1-story dwellings, should have modular technology to make the whole process of replication in the territory as fast and straightforward as possible. They should still have previous elements of their rural life, i.e., gardens surrounding them but should have additional services, yards, verandas, and above all, restoring community feeling. We are trying to unite these individual houses in a new neighborhood, where the spirit of the community is also more robust.

Minister of Reconstruction, media interview, 2020

The post-earthquake Reconstruction project has considered the environmental aspect of bio-architecture. Given that the living spaces, those of living, are better oriented to the south, the whole composition has also had the criteria of technological efficiency. While in terms of seismic protection, the project bases on modular technology using elements based on all Eurocode standards. The buildings will have a plinth of a concrete slab, and the supporting structure is metal construction, which guarantees even in the case of seismic, the highest performance to withstand seismic effects. The exterior wall is a wall composed of two layers of cement fiber and polystyrene insulation. This composition brings even more high energy efficiency in the consumption of these dwellings.

Construction engineer, the post-earthquake reconstruction team

The Minister of Reconstruction brings to attention that the focus has been on investing in sustainable development, investing for the inhabitants of these individual dwellings that will be returned to them in the highest possible efficiency, and reducing costs, especially in electricity (Minister of Reconstruction, 2020). The usage of sustainable materials, building structures, and strong foundations through the implementation of the Eurocode seismic regulations is vital and gives the premises for the future. However, if the respective institutions will not execute these features and the new innovative ideas used in the post-reconstruction projects in future projects, there can be no progress. To lower the vulnerability of the building environment and achieve urban resilience, the project needs to be taken as an example for

future developments. The same features should be enforced into the building construction culture of Albanian society. The project extends in large proportions and entails all the affected areas from the earthquake.

*The reconstruction process includes 26 areas in 8 municipalities (*presented in table 04 and illustrated in figure 5-4*). The Individual housing model will base on three typologies, so the other contributors, who are, let us say, charities, will not be able to go beyond the models according to the law, so the effort and procedure will be joint, although the funds will be separate.*

Minister of Reconstruction, media interview, 2020

Table 04. Project zones of the post-earthquake reconstruction in the respective municipalities. (Minister of Reconstruction, media interview, 2020)

Municipalities	*Project zones*
Durres Municipality	Durres zone 1, 2 and 3 Durres Hospital
Tirane Municipality	The project includes nine zones
Kruje Municipality	Thumane Fushe-Kruje Bubq Kruje
Shijak Municipality	Shijak
Kurbin Municipality	Lac zone 1 and 2
Kavaje Municipality	Kavaje Golem
Vore Municipality	Vore Marikaj
Lezhe Municipality	Lezhe area 1 and 2

Figure 5-4. Project zones of the post-earthquake reconstruction. (Minister of Reconstruction, media interview, 2020)

The organization is done in a modeling way, which can be easily adapted, to move from the typology 1 + 1 to those 2 + 1 and 3 + 1. Comfort has been translated into another criterion, which should be longevity. We have considered all the models of prefabricated buildings, which would bring the highest life expectancy of these apartments.

Construction engineer, the post-earthquake reconstruction tea

Summary. The importance of the post-reconstruction project lies mainly in the message and the idea it conveys. The project design and the inclusion of key elements for risk reduction in construction structures play an imperative role in generating new goals for the future in lowering physical vulnerability and helping Institutional agencies, construction companies, the community, and other responsible stakeholders build resilience. In addition, to this approach is added the use of sustainable materials, the low cost and energy efficiency principle. However, without careful implementation, this idea is almost certainly guaranteed to fail. Figures 5-4, 5-5, and 5-6 show details of the project, the three different typologies, the structure, and the

façade. In figure 5-5, next to the structure design, is attached a wall section plan. The reader can notice a solid structure and combination of the materials used in the section plan, a structure particularly advised in the Eurocode regulation.

Figure 5-4. Three housing typologies on the post-earthquake reconstruction project. (Construction company, Commonsense Architecture Studio, 2020)

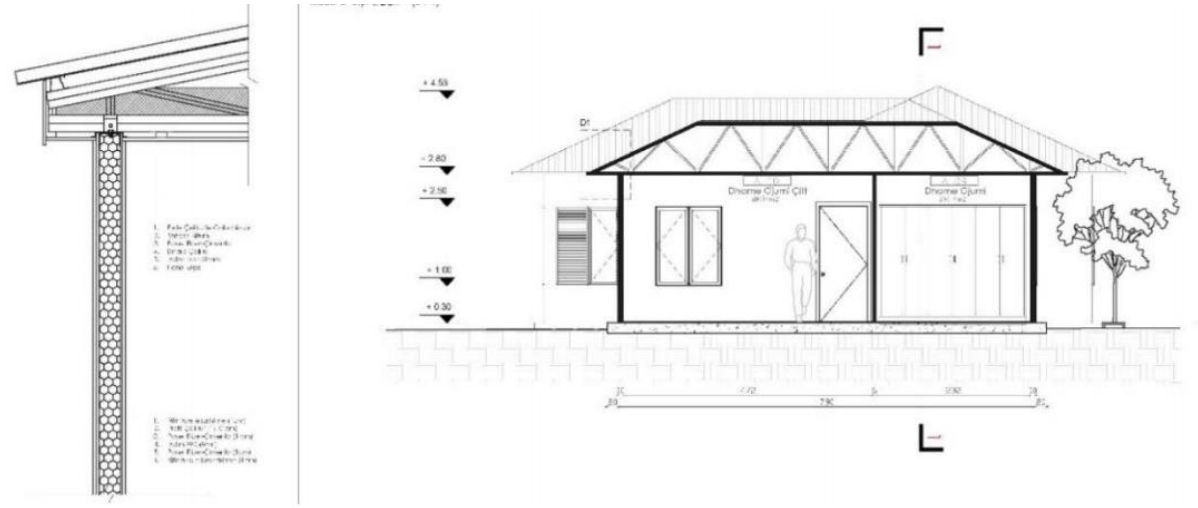


Figure 5-5. Structural details of the housing typology project. (Construction company, Commonsense Architecture Studio, 2020)

Figure 5-6. Facade view of the housing typology. (Construction company, Commonsense Architecture Studio, 2020)

5.1.4 Construction Companies

This section derives from the questionnaire and semi-structured interviews with two construction companies. Part of the findings from the interview and discussions on the new post-earthquake project was addressed in section 5.1.3. Particular emphasis on the discussions was given to the current building codes in Albania and the challenges faced by the practitioners in implementing their projects.

After the earthquakes in 2019 and the extensive damages to the building environment, the discussion about the importance of construction safety has caught considerable public attention in Albania. According to the interviews with the citizens of Durres, the two construction companies, previous research, and information from the Albanian Media, massive damage to the building environment highlighted the significant problems in the construction sector, from abuses in the quality and standard of construction, negligence, and abuse in inspections and testing of buildings, violations of construction rules by interventions made to the existing buildings, damaging or destroying retaining columns (Reporter, Albanian media, 2020).

First, the researcher would like to mention that the available building regulations and seismic design codes for the practitioners are based on outdated criteria (KTP-89, Chapter 4, section 4.4.1). KTP-89 has not been yet institutionally adopted with the recommendations according to the Eurocodes for construction activities. This sets the building environment into a legislative vacuum of construction and design regarding quality and safety. Undoubtedly, these standards are fundamental and directly related to the vulnerability of the building environment towards earthquakes. The situation is also attributed to the lack of a unified methodology for harmonizing these aspects, extending the problem further in planning standards and urban development.

Both the interviewed companies focus on residential construction, preconception, infrastructure, and other significant projects. When asked what measures or precautions they take to the safety of a structure in an earthquake-prone area, the companies respond that the first step is terrain studying, the context, and the soil complexion.

The precaution is, as a start, terrain and soil study. After that comes the foundation of the building. The deeper the foundation, the more security there is in the building. Then the next measure is the quality of the materials used in the project. The iron and the brand of the concrete are essential. An added technique is the concrete strips used for brick walls up to 2 or 3 strips.

Construction engineer, interview session

The researcher stressed the discussion on the building regulations to understanding the practitioners' point of view. Secondly, when asked about the challenges faced in the construction process, both the companies express their discontent in the availability of seismic, technical, scientific, and quantitative information in Albania. Data remains inaccessible by many experts unless generated individually.

In the last 30 years, the plans drafted have considered seismic hazard regionalization and seismic risk maps a legal requirement for the (land use) zoning process dictated by planning experts' professional and moral responsibility. These are macro zoning maps, not micro-level, and both are outdated in the past 40 years. The conservative nature of the data makes them in a position to be used even nowadays. Nevertheless, the zoning has changed during four decades, as confirmed by comparing these maps and the seismic macro-zoning map of the Western Balkans, drafted in 2015.

Construction engineer, interview session

When asked if the seismic study and the maps are a requirement for acquiring a building permit, the engineer responds:

Yes, seismic study is required for each object, especially the multi-story buildings. Today all construction companies conduct the study themselves, as it must be part of the building permit. Prior to the 2000s, the study was conducted by state institutes, but former Prime Minister Fatos Nano liberalized the study, shifting the responsibility to construction companies. The latter are obliged to pay an expert for the seismological study which costs about 1 million ALL for a multi-storey building.

Construction engineer, digital communication

The same situation stands when referring to the use of the building and seismic code. Both the companies have integrated the use of Eurocode in their practice, as they both contemplate that the existing KTP-89 is outdated and in need of change according to Eurocode regulations.

Many construction companies in the country use Eurocode in their project for many years now. We learn in school about KTP-89, but in practice, planners and engineers prefer to implement Eurocode instead. This is a much-discussed topic but should always be mandatory to update because they are based on construction techniques, constantly changing and becoming more innovative.

Construction engineer, interview session

Summary and Recommendations. Although the national building and seismic codes in Albania are based on KTP-89, many construction companies have integrated the usage of Eurocode in their practice. Currently, there are three translated versions of the Eurocodes regulations in Albania. The researcher compared the English and the Albanian versions and concluded that some regulations had not been correctly translated. The implementation of the irregular translated regulation and misinterpretation could cause malpractice. However, many other companies and private practitioners continue to use the Albanian regulations (based on the building risk assessments by Freddi et al., 2021, PDNA, 2020, Polis University, AUA, Co-Plan, 2019, EEFIT, 2020, Guri, 2021, and the fieldwork observations).

The research has also stepped upon a challenge the construction companies face and the outdated building regulations. The absence/ inaccessible official updated seismic risk maps may cause malpractice in construction risk areas without proper protection during the building process. Non- adaptation to the newest building practices, regulations, and seismic risk maps constitute vulnerabilities for the building environment and raise the risk for damages in case of hazards. However, new legislation for building code is not the only measure necessary. Regulations must also be implemented and enforced effectively to ensure that protection and for buildings and their occupants. For the most part, local government building officials who review design plans are responsible for code enforcement, inspecting construction work, and issue building and occupancy permits. During the interview session, it was deducted that in

addition to the adaptation of the building codes, the companies suggest the high quality and fair usage of the construction materials.

5.2 NGOs perspective

In the November 26 earthquake situation, a large group of volunteers, individually or organized, was on the scene to help the affected residents. According to the Ministry of Interior reports (2019), about 302 individual volunteers from different cities such as Tirana, Durrës, Elbasan, Vlora, and Kosovo have offered their substantial assistance in the field. The group of volunteers was mainly in Durrës, Shijak (Area 1), Krujë, Thumane, and Bubq (Area 2) (Ministry of Interior, 2019). The relevance of the NGO´s perspective in this section is related to two main reasons. First, by emphasizing the role of NGOs using the work done by Fundjave Ndryshe Organization (FNO) in disaster relief and collaboration with the governmental institutions in the post-reconstruction process. Secondly, the research emphasizes NGO´s role in community disaster relief using the Association of Woman, Peace and Security (AWPS) work with the affected citizen´s legal and psychological problems caused by the earthquake. Both of these reasons are connected indirectly to the building environment.

The NGOs played a vital role in relief and rehabilitation work. In the immediate response, they helped the residents affected by the earthquake, offering field accommodating centers, setting up camps or small play centers for children, assisting the citizens left without homes, both in clothes and food. In addition, NGOs worked closely with the Civil Protection Committee (CPC), both local and national, mobilizing their resources to provide support during the emergency period. According to the media reports, time management and rapid response from the NGOs and CPC to collecting and distributing aid was challenging, especially given the unorganized response process and the insufficient coordination with the public authorities responsible for crisis management while endorsing the support provided by the NGOs (Portali, 2019). (Portali, 2019). According to Drabek, T.E. and McEntire, D.A, (2002), p.221, cooperation and collaboration between various organizations with different structures, mandates, and purposes is necessary for adequate emergency response (Drabek and McEntire, 2002, p.221).

Fundjave Ndryshe Organization (FNO) is the largest foundation in Albania, focused on its humanitarian activity. During the earthquake of November, the organization's role was fundamental in the first response and the post-earthquake reconstruction program. FNO´s focus is society's development and the integration of people in the community, passing first through

the stages of economic, health, and psychological support. Organized through a detailed structure, the foundation applies the creation and implementation of humanitarian programs in various dimensions of Albanian society (FNO official website, 2021). Only months after the earthquake, FNO raised funding through social media and mobilized donors in helping to move the affected citizens from tents to safe settlements. Due to the time limitation, busy schedule, and the pandemic, it was impossible to interview the organization. However, from digital communication, it was possible to conclude that safe settlement meant an early evaluation of the building had occurred before accommodating the citizens. In collaboration with governmental institutions and the help of donors, FNO is part of the post-earthquake reconstruction project. By cooperating with large factories in Turkey, the NGO is building 100 houses for the families affected by the earthquake. An essential aspect relevant for this research is that the housing project implements Eurocodes regulations instead of the KTP-89.

Association of Woman, Peace, and Security (AWPS). AWPS organization aims to protect women and girls' rights, empower them, and break down barriers to achieving gender equality in all aspects of Albanian social life. From May 2020 onwards, AWPS established the Center for the Protection of Citizens Damaged by the Earthquake. Through this project, the association has provided legal and psychological assistance to the citizens with problems caused by the earthquake.

During the completion of the questionnaire and the interview session, the researcher and the association discussed some of these problems, focusing on the building environment thematic. The association enunciated that the significant legal cases they have been addressing were between the affected citizens and the construction companies, engineers, and urban practitioners in charge of building their settlements.

We have had many complaints from the citizens regarding construction practices used in their houses from the practiocioners which led to the building damages. We have represented them in courts and have won many cases against the practitioners. However, there have also been cases where the citizens had made illegal interventions on their homes, which had not been calculated in the building structure, resulting in the building damages. Other identified problems are lack of transparency and the right to information regarding damages in housing

units. It is ascertained that there are still citizens affected by the earthquake of September 21 and November 26, 2019, who still do not have an act of ascertainment for the categorization of damage. As a result of the inaction of the relevant actors, these citizens today are left out of the reconstruction grants scheme.

Project coordinator at AWPS, interview session

The researcher has addressed the different building damages evaluation before in the research and not having an official report on all the area (section 5.1.2.1). In addition, the association had also reported many cases about constructions carried out according to the respective regulations (KTP-89 and Eurocode8), showing problems with low-quality construction materials and low seismic protection. The low seismic protection from the implementation of the Eurocodes can be attributed to the flawed interpretation of the regulations (refer to section 5.1.4).

When asked about the cases when damaged building was constructed according to the KTP-89 code and the related problems, the respondents replies:

Unfortunately, because of the binding legal confidentiality, I cannot discuss the cases in detail. However, there have been cases with KTP-89 and the decision has been made according to the legal regulations for building permits, the year of construction, and building structure.

Project coordinator at AWPS, interview session

According to the answer, the researcher can make an assumption about the building structure case based on the information gathered on KTP-89. The building codes of 1989 were drafted to provide security for the building typology that existed during that time, for instance multi-story masonry buildings. The dwellings of that typology were not more than 5 floors. If it is assumed that some practitioners will go to court for five- story buildings damaged by the November 26 earthquake, designed according to KTP-89, they will all be in line with the law, having implemented the legal standard in force. However, if the building consists of 10 and 15 floors iand build in areas not recommended by the seismic code KTP-89, the practitioner is at fault.

FNO and AWPS work closely with the community, have gained their trust, and can influence their actions by raising awareness in different thematics. NGOs´ ability to collaborate with governmental institutions (the case of FNO in the post-reconstruction projects) can be used for future reference in establishing more connections and collaborations among other stakeholders. In the process of accomplishing substantial disaster risk reduction, it is needed necessary cooperation between different stakeholders at the local or regional level, as well as vertically and horizontal ones. (Twigg, 2004, p.77).

5.3 Community perspective

Section three of this chapter focuses on the community perspective and their experiences on the hazard, their knowledge about earthquakes, building, seismic codes, and the construction practices followed by them through the years. This part supports the structure of this thesis in understanding the building process through the perspective of community members by using semi-structured interviews, questionnaires, and discussion with a representative sample of 23 community members in Area 1and 2. The factors necessary to include community perspective for becoming involved in the research have 1) relevance, 2) communication, and 3) encourage knowledge on building and seismic code.

Questionnaires. The questionnaires were the first step to approach the citizens. The researcher explained and described the research to each citizen approached, which intrigued interest in many; 23 of them agreed to fill the questionnaire. Some of the first respondents recommended their family or friends, which broadened the network and ensured more collected information. As mentioned in Chapter 3, section 3.3.4, this method was used to open the discussion for the semi-structured interviews. Hence, the questionnaire for the citizens affected by the earthquakes was created based on several topics for Albania, specifically for Durres city, presented in table 05 below.

Table 05. Questionnaire for the citizens (affected) topics.

Questions 1-4	Information on the respondent
Questions 5-7	Knowledge of natural hazards
Questions 8-12	Knowledge of earthquakes
Questions 13-16	Knowledge of disaster management
Question 17	Knowledge of building code
Question 18 a,b,c,d)	Information on the building
Question 19 a,b,c,d)	Information on building damages caused by the earthquake
Question 20	Knowledge of disaster preparedness
Question 21	Knowledge of community participation in disaster management

Each topic is chosen concerning the research, and the extent to which these topics were discussed with the respondents depended on the informants' perspectives. Every answer opened more follow-up questions, allowing in-depth investigation of the respondent's knowledge according to their perspective.

Interviews. The 23 interview respondents of this study came from the two identified areas with the most damages in Durres (Area 1 and 2, chapter 4, section 4.2.1). They shared similar and different experiences from the earthquake, their concerns, their knowledge, and their interests in being more involved in the thematics of vulnerability, building codes, disaster management, and urban resilience. Simultaneously with the data collected from the interview, the researcher has also worked on data analysis. As Oliver C. Robinson (2014), p.31, states, analyzing the data no later than the time of collection gives the researcher the possibility to make real-time judgments and decide whether additional data is required (Robinson, 2014).

Knowledge of natural hazards and earthquakes.

All the respondents were aware of the risk of natural hazards in Albania, whether from experience or through the media. 14 out of 23 respondents expressed their concerns regarding the risk, exposure, and community vulnerability in the events of natural hazards. 10 out of 23 respondents classified earthquakes as the hazard that affects more the area they live in and Albania, while 13 specified flooding. After the earthquake of November, the citizens expressed that they had become more aware of the effects of earthquakes.

´It has been a hard time for us enduring one hazard after the other. Flooding is expected in the area I live from heavy rains and insufficient infrastructure. Still, in 2019 except for flooding, we had to go through two significant earthquakes, the aftershocks, and the pandemic. It has been a hard time. ´

R1, interview session

To the question: ´Why do you think Albania is so prone/vulnerable to hazards/ earthquakes? ´ the respondents' answers were between the geographic position, human intervention, and mismanagement of natural hazards. Human interventions constituted in construction without a

permit (often without construction plan and building regulations), the addition of floors without consulting specialists and interventions is structural elements by the residents themselves, making the building vulnerable to earthquakes.

Evaluation of building damages caused by the earthquake. The respondents lack knowledge of building, seismic codes, and disaster management. Although they are aware of existing building regulations, 19 out of 23 confuse building codes with legal restrictions on building construction. Concerning the history of the building construction in the country on the self-built category and the informal settlements (chapter 4), the construction abuse, this information does not surprise the researcher. Ainuddin et al. (2014) and Dixit and Leon (2009) define building code as an effective tool created for the structure to withstand and protect lives from earthquakes, reducing community risks (Ainuddin et al., 2014, Dixit and Leon, 2009). While it the responsibility of governmental institutions to ensure drafting and implementation of the building codes, the community also plays an important role. Cities are built for people, and people should have a voice in this process. Enforcement of building codes accounts for safer communities.

After the earthquake of September 21, 5 out of 23 respondents said that their houses received light cracks in the walls, while one of them stated that damage on the walls was also noted in addition to cracks. Following the 26th November earthquake, these damages were enhanced. All of the 23 respondents received a full building evaluation. According to the discussions with the respondents, the researcher has created table 06 with the classification of the damage evaluation on the respondents 'houses. The respondents, whose houses had received damages D1and D2 (refer to table 06) were granted donations from the GoA to fix the damages, while the respondents, whose houses were classified with high scale damages were obligated to sleep in tents, stay with relatives, or in rented apartments.

After the damage evaluation was done to your house, did you get a full description of the damages, why the building could not withstand the intensity and what could have been done to avoid this situation? - the researcher.

Yes, two engineers came to inspect the house some months after the earthquake. For months we had to sleep in tents in front of the house. After they inspected the house from outside and inside, they said that the damages were not dangerous, and we could use the house again.

R2, interview session

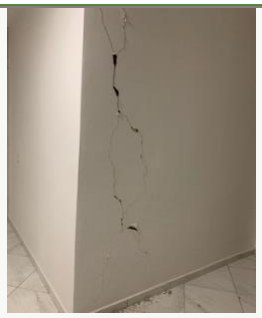
Although when asked if they had received a specific description on why the structure did not hold, the respondents had not received full information. The evaluation on table 06 was done by the researcher according to the pictures and the description from the respondents.

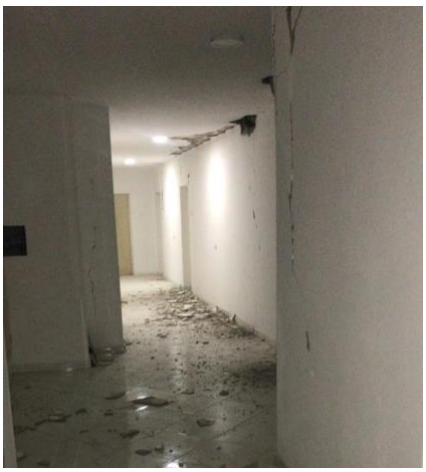
Noncompliance with the building regulations and seismic codes has made a significant impact in the Albanian community. The respondents expressed deep concerns about the damages, losing their homes and for the future events.

"I have been living in this house for 72 years — that's how old I am. This house dates back to many years ago, since the first member of our family lived here. The first earthquake that damaged this house was in 1979 — the front side of the house was reconstructed then. The September 21 earthquake damaged it again and cracked its walls. Then the November 26 earthquake came and my house was evaluated as non-habitable," R3, a Thumana resident, showing deep cracks both inside and outside the walls of the house where he has spent his entire life

R3, interview session

Table 06. Classification of the damages according to the evaluation done on the respondents' buildings and the interviews (pictures provided from the respondents)

Nr. Respondents	Pictures according to the damages	Damages Description	Notes
9 houses were evaluated in this category	   	**D1** No visible damage to structural elements. Possibility of small cracks in the wall plaster and ceiling. Slight structural and non-structural damage.	Seismic codes: KTP-78, -89 No codes implemented. Constructions with this degree of damage do not necessarily show reduced seismic capacity and misuse of building codes and do not pose a risk to life. After repairing possible damage, the building can be used directly.

	 	**D2** Cracks in wall or ceiling plaster. The fall of large pieces of plaster from the wall and ceiling surface. Visible cracks or partial collapse of walls. Cracks in structural parts. They do not pose a risk to life.	Seismic code: KTP- 89, Eurocode Buildings with this degree of damage have significantly reduced seismic ability. Restricted entry is allowed, but not the use of the apartment until the moment of repairing the cracks and retrofit
3 houses were evaluated in this category	 	D3 Diagonal or other cracks in retaining walls, in walls between windows, and other structural elements. Large cracks in the structural parts with concrete: columns, beams, walls.	Seismic code: KTP- 78, no code used. Buildings with this degree of damage have significantly reduced seismic ability. Restricted entry is allowed, but not the use of the apartment until the moment of repairing the damages and reinforcement.

			
2 houses were evaluated in this category	 	D4 Structural elements and their connections are highly damaged or displaced. A large number of broken structural elements. Easy displacement of structural elements. Large cracks with fallen wall material.	Seismic codes: KTP- 78, no code. Buildings with this degree of damage are unsafe and are likely to collapse suddenly—insignificantly high reduced seismic ability. The facility must be demolished.

Summary and recommendations on community participation. Communication and cooperation with citizens are critical aspects of the performance in building resilence. Through the interview sessions, the researcher found that citizens know that in case of emergencies, first response and protection should come primarily from the local Government, armed and police forces, fire protection brigades, and hospitals. However, citizens express dissatisfied comments with the level of service provided by the emergency institutions (local, national and operational structures). However, citizens reckon they have cooperated better with local and international voluntary organizations during emergencies than with public institutions and voluntary groups established by the municipalities or their facilities. In addition, the lack of follow-up support, training, and awareness-raising after the emergency stage dominates citizens' perceptions of service's valuation. This could be summarized as what the UNDP and Red Cross Albania RCA(2004) describe as a lack of communication between public institutions responsible for civil protection and community (UNDP and RCA, 2004).

Besides the fact that voluntary citizen engagement is instead stigmatized in Albania (due to the past communist inheritance), a significant factor impeding municipalities ias the organizaition in collaborating with other local intitutions, NGOs and the community. With the new project planned from NCPA, GoA and the international organizations on strengthening local governments, participatory planning is taken into consideration as an important measure in the process of building resilience. In the latest initiatives taken by such organizations involve different trainings with the international teams as the principal strategy in implementing these actions. Although during the emergency situation, a cooperation between the voluntary organizations and the local civil protection institutions, the absence of the respective continuous collaboration is seen afterwards. In the case of establishing these collaborations, the municipalities could organize different groups with common objectives. A new law could be instituted on local self-governance, which would determine specific legislation to set limits and regulations of involvement, responsibilities, measures for safety and insurance, liabilities and immunity, including training.

5.3.1 Fieldwork observations.

The fieldwork experience allowed the researcher to observe first-hand the effects of the earthquake in the building environment, identify the vulnerabilities, ascertain part of the reconstruction process, discover the recovery process and the efforts done for the community and the building environment in building resilience. Through observations during fieldwork, it was possible to map and subsequently distinguish the housing typology through the construction phases, the level of damage, and compliance with the building regulations. Table 03 (Chapter 4, section 4.3.1) shows a building classification regarding the construction phases, while figure 5-6 a classification of the building damages is done in accordance with the researcher remarks and information received from verbal communication with the citizens.

a)

Structure Characteristics: Multi-storey buildings with reinforced concrete frame system, design code "unidentified." Location Durres. To be demolished.

Damage analysis: Significant local damage to the perimeter walls and the cage and stair ramps.

1 2

b)

Structure Characteristic: Multi-storey masonry buildings. Design code: Building 1: KTP-78, 2: KTP-63

Damage analysis: Structural damages, severe damages of retaining masonry walls. To be demolished.

Reason: Low thickness of walls, deterioration of bricks, outdated design code implementation.

Figure 5-6. Classification of observed buildings according to damages received in Durres city. a)Multi-storey residential/phase of construction after 1990, b) Multi-storey residential masonry /phase of construction 1945- 1960-1990 (Source: author)

During the fieldwork, it was possible to observe the process of retrofitting in some of the buildings that were not damaged in structures. The process of retrofitting in Durres context could be divided in:

- Retrofitting process ordered by the government and executed by the practitioners (figure 5-7 a, b, c)
- Retrofitting process funded by the government and executed by the citizens (figure 5-7, d).

a)  b) 

c)  d) 

Figurere 5-7. Process of building retrofitting in Durres city. (By the author)

Summary on building damages. The fieldwork experience helped the researcher in seeing up close the damages caused from seismic activity in the context of Durres. The earthquake had impacted all forms of building typology, as well as from all the three phases of construction. In attempt to specify the used building codes in the building environment, the researcher conducted interviews with the citizens and building damage evaluations. The evaluation and the field research concluded that buildings with building codes KTP-78, KTP-89 and the building which had no codes implemented had suffered more damages than the one which were constructed according to the Eurocode regulations. Although also buildings which had been registered for following Eurocode had suffered damages. This could be due to misuse of the code, incorrect interpretation of it, or errors made in calculating loads during design.

The observation research concluded that the building typology most affected were multistory residential building. Seismic activity is one of the most significant risk factors for multistory buildings affecting the dimensioning of structural elements. Therefore it is of utmost importance to design these structures according to the regulations guidance. Seismicity is represented by the flexible design spectrum, which according to the Albanian standard KTP-N2-89 many multistory structures are designed with masonry. Multistory masonry buildings that are constructed following the KTP-89 in Albania, do not contain a prop or plastic elements with load bearing, so they are more at risk. For buildings to resist high intensity seismic force, it is necessary to have ductile behavior to absorb seismic energy. Therefore, significant damage is caused to these structures by the seismic loads. They can only face small intensity earthquakes due to the high stiffness of the large working section. The old Albanian design codes do not provide sufficient measures for the seismic safety of these buildings. The situation becomes even more severe when degradation over the years and structural interventions are considered. For these reasons, these structures do not meet the utilization requirements and are in need for new technical building codes implementation. Most countries in Europe have incorporated the design practice of "Structural Eurocodes," which reflect a high level of knowledge in structural engineering. These codes are now part of the design practice in Albania as well, and work about this has been going on for several years, either with official initiatives of the responsible institutions or with individual initiatives of Albanian engineers. The seismic design of structures according to Eurocodes, summarized in Eurocode 8, is more advanced than the one based on our country's Technical Design Conditions (KTP). The last update of KTPs was made in 1989 with the approval of KTP-N.2-89 (Academy of Sciences, Ministry of Construction, 1989).

6. Discussion

The earthquake of November 2019 embodied a crisis regarding the security and quality of construction, and disaster administration in Albania's building environment levels and dimensions. The occurrences also highlighted the lack of proper preparation to cope with, prevent, or mitigate the effects of disasters or devastating crises. At this juncture, it was crucial for the society to focus energy and attention on addressing the situation, act to address crisis prevention, mitigation, and management in the long run. Above all, it was vital to learn lessons for the future, to become aware of the risk and, develop good practices for future events.

Apart from the consequences of earthquakes, the direct impact of the seismic event depends on the development of public policies of disaster prevention and adequate emergency plans. Though being a concept and a theme with less attention than deserved, the assurance of structural safety in a sustainable built environment is a fundamental challenge but a necessity for the country. The urban building environment continuously requires maintenance and rehabilitation, and ensuring the implementation of applicable building codes necessitates good sources for its preservation. The damages caused by an earthquake may turn out to be so devastating to disable entire cities.

This research developed the case study analysis in three perspectives: i) governmental institutions, ii) NGOs, iii) community. The extensive damages to the building environment emphasized earthquake vulnerability for the entire society in many levels. Although the most direct impact was on the community, the crisis revealed deficiencies on disaster management structures of governmental institutions. It was the GoA who addressed this issue and immediately started the response actions by enforcing new legislation and new institution for disaster management.

Through many years (refer to the historical timeline of earthquakes in the country, figure 1-1), Albania has suffered losses from earthquakes in the building environment, economy, and community. From the law enforcement on Governmental Institutions to architects,engineers, builders to the community, the adoption and enforcement of building codes ensure sound construction and help build a culture of preparedness in case of natural hazards.

As the researcher has discussed in chapter 2, there are many factors that affect urban resilience and physical vulnerability, and no place is alike in their natural capacity to rebound. Some of these factors include functions of larger governmental/ institutional and economic realities that are not easily changed within the context. If Durres were a robust city with a diversified economy, for example, it would rebound much more quickly. Campanellla, (2006) states that cities or countries that invest in hazard mitigation, preparedness planning, and action can also reduce their vulnerability while enabling a municipality to endure a crisis with minimal loss of life (Campanella, 2006). Regardless, the government and institution's role in improving resilience does not only consists in initiating and implementing adequate good contingency and well-rehearsed emergency and disaster management plans. Urban planning, too, can reinforce a city's resilience, as it dramatically affects its vulnerability. Land use and territorial planning are critical factors in risk control and prevention. Where to build is just as important as how to build.

From the field and desk research was deduced that many collapsed and damaged buildings from the November earthquake (some previously rendered vulnerable from the September earthquake) were constructed using outdated seismic codes, had implemented irregular building techniques, had malpractice elements or were realized by self-help builders using no regulation. Another reason for the building collapse is attributed to the foundation failure (mainly in the coastal area), because heavy constructions were built on unstable soils, resulting in the process of soil liquification (Luljeta Buzi interview session). These illustrates that first, sound law and building regulations must be followed according to the building code, as well as the control of building materials (ie. Correct mixing of the concrete components, high quality and sustainable materials, innovative solutions).

Building code provides not only the minimum standards for the structural safety of the building, but through effective implementation and compliance with the code fulfills the primary requirement for the life safety. Many researchers have stressed their work on promoting implementation of effective building codes. Ainuddin et al. (2014) notes that poor compliance and implementation of building codes and malpractice construction increases earthquake vulnerability (Ainuddin et al. 2014). The researcher stresses on the compliance of building

regulations, because although the Albanian building codes KTP-52-63-78-89 have been available for the practiocioners, the enforcement process and utilization of such codes has been a major dispute in the country (informal, self-build settlements, illegal structures with no engineering project and construction permit).

Ainuddin and Routray, (2012), and Bilham, (2009) indicate that building code non-compliance has been the cause to significant loss to deaths and properties to disasters triggered by natural hazards. To summarize, the reasons that led to the high building damages from the earthquake were poor construction practice, not building in accordance with the law and construction regulations, poor compliance with the building code, and low preparedness.

The researcher would add to these reasons building codes availability. Although the KTP-89 are the primary building code official regulations for the country, the document is not available for the public. There is no online data or shared document of the code from the responsible construction intitutions. In order to conduct the study on the codes, the researcher received a copy of the document KTP-78, KTP-89 from Guri.M, professor at Polis University, Albania. Although many construction companies have started to implement Eurocode instead of KTP-89, the question remains as to what version of this document they are using. When comparing the Eurocode regulations available in Albanian language to the ones in EN 1998-1, (2004), there are some differences.

In addition to the availability of the codes, an important issue is the availability of seismic risk maps. Although seismic study is a legal requirement for the (land use) zoning process and for the legal construction permit, there is no updated seismic map that the planners can use. Instead, the seismic study should be conducted by the construction company and seismic maps generated individually. The researcher recommends that more attention should be paid to the geological aspect than to the content of the structure in for the application for building permits. Currently, the criteria for permits mostly assess the aspect of the volume of the structure, while more time and conditions should be devoted to verification of the geological aspect where the object is placed and the seismological criteria. A unified building language should be used, instead of practitioners using both KTP-89 and Eurocode. Implementing the official Eurocode

regulations into legislation and the building culture, while also generating new updated seismic maps is an important step towards lowering earthquake vulnerability.

Nonetheless, the building environment vulnerability cannot be reduced only by establishing a unified building code, if this code is not enforced (Quarantelli, 2003). In the urban context of Albania, the vulnerability is influenced by the construction abuse and informal settlements that did not follow the buildings codes.

Enforcement of the building codes requires a collaboration through the many sectors of the society in Albania. This research analyzed some of the ways the noncompliance of building codes impacted the building environment and the societyes vulnerability to seismic hazards, while researching for gaps and good practices in lowering building environment vulnerability and building resilence. This direction requires decisive action taken on many levels. The GoA has established the new NCPA (refer to chapter 5), which has integrated the resilience approach in the long run of disaster management plan. Although NCPA has started the local government strengthening project, in order to address directly the building environment, all levels of the government administration have to implement capacity building, collaborate and cooperate directly with the NGOs and the community. In accordance with this approach, the researcher has created a framework called Three Perspectives Collaboration network (figure 6-1), which gives an insight of a good practice towards lowering building environment in the context of Albania.

Three Perspective Collaborative Network. The core function of the framework consists in the GoA and the respective institutions responsible for disaster management (in this case NCPA and its derivatives) in cooperation with the Construction Institute in Albania and other private construction companies/ building regulators/ practitioners initiating a collaboration platform with the local NGOs and the community in the sole purpose of applying building code compliance culture in the society.

In addition to the establishing Eurocode standards as the official building code, generating updated seismic and geologic maps, implementing seismic study and seismic codes in the construction permit application, the GoA and the disaster management institutional panel in

association with the Construction Institute should provide training modules for educating the building practitioners and the community on the use of building code and various ways of achieving compliance. From the fieldwork study it was deducted that the community has no knowledge over building vulnerability or building codes. Somiah et al., (2015), states that the ignorance of the general public of the building codes makes the compliance to the rules difficult (Somiah et al., 2015). Therefore, the community must be educated in order to understand the importance the building code has earthquake risk reduction and their safety. The researcher supposes that if the training platform will motivate the community in taking action, be more aware of the importance of building codes, and become more resilient.

Trainings regarding the construction practitioners should be more intensive regarding widespread knowledge of building code requirements in interpretation and practice. In order to ensure the correct execution of the regulations, the Construction Institute should appoint qualified building inspectors to verify the building process step by step.

The operation of this platform depends directly on the cooperation of the three key stakeholders. Thus, bearing in mind the important role these organizations played during the crisis and the post-earthquake reconstruction, the researcher puts the local NGOs as a facilitator in the process. The local NGOs work closely with the community and have gained their entrust, while also proving that when given the chance, they can cooperate with the GoA towards the same goal.

Nurturing better collaboration among the three stakeholders does not only contribute to the building code enforcement but promotes mitigation for earthquake hazard. In the unfortunate case that the cooperation between the parties fails to succeed, the result would indicate regression in achieving the objectives, therefore failing in lowering the vulnerability of the building environment. The three stakeholders play different roles in the society, have different perspectives, but communicative efforts and motivation can lead in working together towards carrying out a successful building code enforcement.

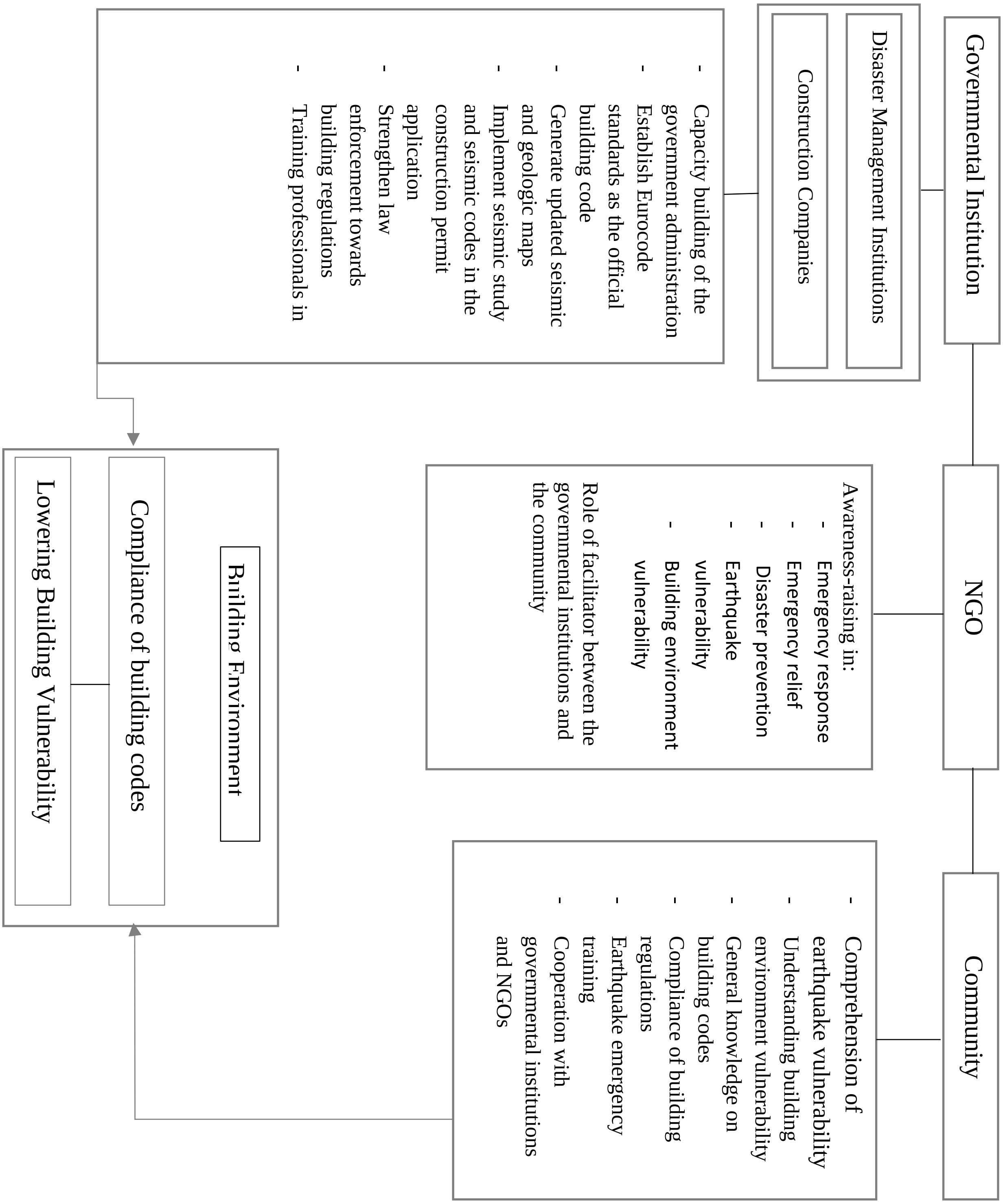


Figure 6-1. Three perspectives Collaboration Framework.

7. Conclusion

The key objectives of this thesis were analyzing and discussing how the implementation/ non implementation of the building codes had impacted the society's vulnerability to seismic hazards in the context of Durres, how had the government organized and implemented the process of disaster management and post-earthquake reconstruction and, how can the context generate good practices in lowering building environment vulnerability and building resilence. The thesis opens with a description of the earthquake of November 2019 and the inflictions the disaster made on the society and the building environment. The event is described in detail in order to to understand the scale of vulnerability in which the ccontext was.

Under the guidance of the theoretical background (chapter 2) and core concepts of resilience, natural hazards, vulnerability, and building code, the researcher conducted the case study analysis from three perspectives: i) governmental institutions, ii) NGOs, iii) community (chapter 5). To carry out the research, the case study of Durres earthquake is chosen as the methodological backbone of this thesis, followed by desk work and fieldwork research approach. The theoretical background was used in developing questionnaires for the stakeholders, and the interview questions were based on the stakeholders ś knowledge over the thematic of the theories that supported the research.

The findings revealed lack of/ outdated proper documents, irregularities in the construction practices, as well as no use/ misuse of the building codes, which was the primary cause of the damages caused by the earthquake.

From the interview and discussion with the NCPA (National Civil Protection Agency, the researcher concluded that the disaster management policies have started to develop in the right direction after the disaster, having as main objective the rehabilitation and resilience process as objective. However, the conditions of the disaster management plan and the responsible institutions before the disaster were not adequate to withstand the crisis. The National Plan for Civil Emergencies (NPCE) dated back to 2004 and lacked implementation.

From the interview and discussion with the construction companies, it was revealed that the practitioners lacked up to date seismic and geologic maps, which were a requirement in the construction policies and construction permit applications. The practitioners also stated that many construction companies had started to implement the Eurocode building standards instead of the KTP- 89, which is the official building code for the country. The KTP-89 was drafted in 1989 and has not been updated ever since. The researcher discovered that the existing available Eurocode in the Albanian language has not been adapted and translated properly. In addition, The KTP-89 is not available in the webpages of the responsible construction institutes, nor any version of it has been posted online.

From the interviews and discussion with the community respondents, it was concluded that the citizens did not have any knowledge over the building or seismic regulations. None of the 23 respondents received building evaluation after the earthquake of September 21, while all stated that received evaluations after the November 26 earthquake.

From the deskwork and fieldwork research it was concluded that there is a gap in the collaboration between responsible intitutions between one another, and there has been no cooperation with the community in disaster risk preparedness before the earthquakes. The study emphasizes the role of NGOs in the emergency response and relief, as well as in the post-reconstruction progress.

This study aims to give an insight of the importance of building code in disaster risk reduction, lowering the building environment and zooming in on how the country can learn from previous historical earthquakes to reshape new behaviors and attitudes in the community, responsible governmental institutions, and local NGOs in the context of Durres city. The elements of the MOVE framework are applied as a basis for developing the Three Perspectives Network framework, and using the findings from the research as differentiating indicators and the needed criteria for lowering building environment vulnerability. Thus, after assessing physical/ economic/ environmental/ human-social vulnerability using the data collection methods and exposing damages done to the urban areas in the case of Durres, it is possible to develop a network between the three key stakeholders and setting a principal goal for the drafting,

implementation and enforcement of the official building and seismic code.

It is essential to understand that the process cannot be immediate, mainly because it includes many fields like urban planning, disaster risk management, and stakeholders cooperation. Although this process is necessary, it requires capacity, knowledge, dedication, and finances.

Limitations. The study adopted a qualitative approach with data collected from interviewing different retrospective stakeholders. The data collected from the questionnaires might be challenged by the incomplete or inaccurate memory of respondents or based on their personal opinions or dissatisfaction in relation with the disaster management and the responsible institutions. This could threaten the credibility of the study or lead to incorrect given information. The use of qualitative design also leads to the study being more contextual. 23 interviews are considered as small sample data, therefore the data collected cannot be generalized and used for a bigger context.

Future research. Future research as continuation of this research can focus on exploring what constitutes as good practices for the implementation of the Three Perspectives Network framework to ensure better collaboration between the stakeholders. Thematic as collaborative or participatory planning can be addressed for the research.

8. References

Book

Bekker, I. (1835). *Georgii Pachymeris de Michaele et Andronico Palaeologis libri tredecim* (Vol. 2). Weber.

Birkmann, J. (2014). *Measuring Vulnerability to Natural Hazards: Towards Disaster Resilient Societies*. United Nations University Press.

Bryman, A. (2016). *Social Research Methods* (5th ed.). Oxford University Press.

Ching, F. D. K., & Winkel, S. R. (2018). *Building Codes Illustrated: A Guide to Understanding the 2018 International Building Code* (6th ed.). Wiley.

Densombe, M. (2021). *The Good Research Guide: For Small-Scale Social Research Projects by Martyn Densombe (2014–08-01)*. Open University Press.

Levin, H. L., & Jr., D. K. T. (2016). *The Earth Through Time* (11th ed.). Wiley.

Tjora, A. (2018). *Qualitative Research as Stepwise-Deductive Induction*. Taylor & Francis.

Twigg, J. (2004). *Disaster risk reduction: mitigation and preparedness in development and emergency programming.* Overseas Development Institute (ODI).

Yin, R. K. (2004). *The Case Study Anthology* (1st ed.). SAGE Publications, Inc.

Journal articles, conferences and newspapers

Ahmed, B., Kelman, I., Fehr, H., & Saha, M. (2016). Community Resilience to Cyclone Disasters in Coastal Bangladesh. *Sustainability*, *8*(8), 805. https://doi.org/10.3390/su8080805

Ainuddin, S., Mukhtar, U., & Ainuddin, S. (2014). Public perception about enforcement of building codes as risk reduction strategy for seismic safety in Quetta, Baluchistan.

International Journal of Disaster Risk Reduction, *9*, 99–106. https://doi.org/10.1016/j.ijdrr.2014.04.007

Ainuddin, S., & Routray, J. K. (2012). Community resilience framework for an earthquake prone area in Baluchistan. *International Journal of Disaster Risk Reduction*, *2*, 25–36. https://doi.org/10.1016/j.ijdrr.2012.07.003

Ambraseys, N. (2009). Earthquakes in the Mediterranean and Middle East: a multidisciplinary study of seismicity up to 1900. *Cambridge University Press.* Published.

Bilham, R. (2009). The seismic future of cities. *Bulletin of Earthquake Engineering*, *7*(4), 839–887. https://doi.org/10.1007/s10518-009-9147-0

Birkmann, J., Cardona, O. D., Carreño, M. L., Barbat, A. H., Pelling, M., Schneiderbauer, S., Kienberger, S., Keiler, M., Alexander, D., Zeil, P., & Welle, T. (2013). Framing vulnerability, risk and societal responses: the MOVE framework. *Natural Hazards*, *67*(2), 193–211. https://doi.org/10.1007/s11069-013-0558-5

Campanella, T. J. (2006). Urban Resilience and the Recovery of New Orleans. *Journal of the American Planning Association*, *72*(2), 141–146. https://doi.org/10.1080/01944360608976734

Cara, S., Aprile, A., Pelà, L., & Roca, P. (2018). Seismic Risk Assessment and Mitigation at Emergency Limit Condition of Historical Buildings along Strategic Urban Roadways. Application to the “Antiga Esquerra de L’Eixample” Neighborhood of Barcelona. *International Journal of Architectural Heritage*, *12*(7–8), 1055–1075. https://doi.org/10.1080/15583058.2018.1503376

Danermark, B. (1993). Post-war urban and regional development in Albania. *Habitat International*, *17*(2), 73–90. https://doi.org/10.1016/0197-3975(93)90006-x

Drabek, T. E., & McEntire, D. A. (2003). Emergent phenomena and the sociology of disaster: lessons, trends and opportunities from the research literature. *Disaster Prevention and Management: An International Journal*, *12*(2), 97–112. https://doi.org/10.1108/09653560310474214

Egbelakin, T., Wilkinson, S., & Ingham, J. (2015). Integrated framework for enhancing earthquake risk mitigationn decisions. *International Journal of Construction Supply Chain Management*, *5*(2), 34–51. https://doi.org/10.14424/ijcscm502015-34-51

Egbelakin, T., Wilkinson, S., Potangaroa, R., & Ingham, J. (2013). Improving regulatory frameworks for earthquake risk mitigation. *Building Research & Information*, *41*(6), 677–689. https://doi.org/10.1080/09613218.2013.819546

Erdik, M. (2017). Earthquake risk assessment. *Bulletin of Earthquake Engineering*, *15*(12), 5055–5092. https://doi.org/10.1007/s10518-017-0235-2

Erdik, M., Fahjan, Y., Ozel, O. et al., M., Fahjan, Y., & Ozel, O. (2003). Istanbul Earthquake Rapid Response and the Early Warning System. *Bulletin of Earthquake Engineering 1*, 157–163.

Evangelatou-Notara, F. (1993). Earthquakes in Byzantium from the 13th to 15th Century. *Historical Research, Athens.* Published.

Freddi, F., Novelli, V., Gentile, R., Veliu, E., Andreev, S., Andonov, A., Greco, F., & Zhuleku, E. (2021a). Correction to: Observations from the 26th November 2019 Albania earthquake: the earthquake engineering field investigation team (EEFIT) mission. *Bulletin of Earthquake Engineering*, *19*(7), 2993–2994. https://doi.org/10.1007/s10518-021-01096-y

Freddi, F., Novelli, V., Gentile, R., Veliu, E., Andreev, S., Andonov, A., Greco, F., & Zhuleku, E. (2021b). Observations from the 26th November 2019 Albania

earthquake: the earthquake engineering field investigation team (EEFIT) mission. *Bulletin of Earthquake Engineering*, *19*(5), 2013–2044. https://doi.org/10.1007/s10518-021-01062-8

Gohari, Medalen, & Aranya. (2019). Exploring the Impact of Complex Multi-Level Governance Structures on the Societal Contribution of Universities to Knowledge-Based Urban Development. *Social Sciences*, *8*(10), 279. https://doi.org/10.3390/socsci8100279

Guri, M., Brzev, S., & Lluka, D. (2021). Performance of Prefabricated Large Panel Reinforced Concrete Buildings in the November 2019 Albania Earthquake. *Journal of Earthquake Engineering*, 1–27. https://doi.org/10.1080/13632469.2021.1887010

Hernández, M., Carreño, M., & Castillo, L. (2018). Methodologies and tools of risk management: Hurricane risk index (HRi). *International Journal of Disaster Risk Reduction*, *31*, 926–937. https://doi.org/10.1016/j.ijdrr.2018.08.006

Janku, E., Allkja, L., & Aliaj, B. (2017). Albania 2030 Manifesto, an Example for Adapting Advanced National Spatial Planning Instruments for Developing Countries. *Universal Journal of Management*, *5*(7), 320–331. https://doi.org/10.13189/ujm.2017.050702

Kelman, I., Gaillard, J. C., Lewis, J., & Mercer, J. (2016). Learning from the history of disaster vulnerability and resilience research and practice for climate change. *Natural Hazards*, *82*(S1), 129–143. https://doi.org/10.1007/s11069-016-2294-0

Kociu, S. (2004). Induced Seismic Impacts Observed in Coastal Area of Albania: Case Studies. *International Conference on Case Histories in Geotechnical Engineering*, *11*. https://scholarsmine.mst.edu/icchge/5icchge/session03/11?utm_source=scholarsmine.mst.edu%2Ficchge%2F5icchge%2Fsession03%2F11&utm_medium=PDF&utm_campaign=PDFCoverPages

Kramer, S. (1996). Geotechnical Earthquake Engineering. *Prentice-Hall, Upper Saddle River, NJ, USA*. Published.

Lang, D. H., & Meslem, A. (2017). Physical vulnerability in earthquake risk assessment. *In Oxford Research Encyclopedia of Natural Hazard Science.* Published.

Lewis, J., & Kelman, I. (2010). Places, people and perpetuity: Community capacities in ecologies of catastrophe. *ACME: An International Journal for Critical Geographies*, 207–298.

McEntire, D. A. (2005). Why vulnerability matters. *Disaster Prevention and Management: An International Journal*, *14*(2), 206–222. https://doi.org/10.1108/09653560510595209

Meerow, S., Newell, J. P., & Stults, M. (2016). Defining urban resilience: A review. *Landscape and Urban Planning*, *147*, 38–49. https://doi.org/10.1016/j.landurbplan.2015.11.011

MINIATI, M. (1995). EMANUELA GUIDOBONI, Catalogue of ancient earthquakes in the Mediterranean area up to the 10th century, Rome, Istituto Nazionale di Geofisica, 1994, 504 pp., ill. *Nuncius*, *10*(2), 879–880. https://doi.org/10.1163/182539185x01377

Mück, M., Taubenböck, H., Post, J., Wegscheider, S., Strunz, G., Sumaryono, S., & Ismail, F. A. (2012). Assessing building vulnerability to earthquake and tsunami hazard using remotely sensed data. *Natural Hazards*, *68*(1), 97–114. https://doi.org/10.1007/s11069-012-0481-1

Muco, B. (2006). SEISMICITY OF THE ADRIATIC MICROPLATE AND A POSSILE TRIGGERING: GEODYNAMIC IMPLICATION. *In The Adria Microplate: GPS Geodesy, Tectonics and Hazards*, 351–367.

Muço, B. (2013). Probabilistic seismic hazard assessment in Albania. *Italian Journal of Geosciences*, *132*(2), 194–202. https://doi.org/10.3301/ijg.2012.33

Papadopoulos, G., Agalos, A., Carydis, P., & Lekkas, E. (2020). The November 26th 2019 Mw 6.4 Albania Destructive Earthquake. *Seismological Research Letters.*, 1–10.

Participant observation: a guide for fieldworkers. (2011). *Choice Reviews Online*, *49*(01), 49–0366. https://doi.org/10.5860/choice.49-0366

Simaku, G. (2017). Albanian Building Stock Typology and Energy Building Code in Progress Towards National Calculation Methodology of Performance on Heating and Cooling. *European Journal of Multidisciplinary Studies*, *5*(1), 13. https://doi.org/10.26417/ejms.v5i1.p13-35

Singh, S. R., Eghdami, M. R., & Singh, S. (2014). The concept of social vulnerability: A review from disasters perspectives. *International Journal of Interdisciplinary and Multidisciplinary Studies*, *1*(6), 71–82.

Somiah, M. K., Osei-Poku, G., & Aidoo, I. (2015). Relative Importance Analysis of Factors Influencing Unauthorized Siting of Residential Buildings in the Sekondi-Takoradi Metropolis of Ghana. *Journal of Building Construction and Planning Research*, *03*(03), 117–126. https://doi.org/10.4236/jbcpr.2015.33012

Steinlin, M. (2003). Helvetas : vers des technologies participatives. *Annuaire Suisse de Politique de Développement*, *22–2*, 141–143. https://doi.org/10.4000/aspd.569

Zainal, Z. (2007). Case study as a research method. *Jurnal Kemanusiaan*. Published.

Ajay, G., Peruvemba, R., & Peruvemba, P. (Eds.). (2019). *A Health SDI: The Benefits of and A Call-to-Action for Building a Global Health SDI*. Preprints.

Alcántara-Ayala, I., Murray, V., Daniels, P., & McBean, G. (2017). Challenges for the Integration of Science into International Policy Development for Landslide Disaster

Risk Reduction. *Sassa K., Mikoš M., Yin Y. (Eds) Advancing Culture of Living with Landslides. WLF 2017. Springer, Cham.* International Council for Science (ICSU)—On the Future. https://doi.org/10.1007/978-3-319-59469-9_10

Aliaj, S., Adams, J., Halchuk, S., Sulstarova, E., Peci, V., & Betim, M. (2004). *Probabilistic Seismic Hazard Maps for Albania*.

Berke, P. R., & Campanella, T. J. (2006, March). Planning for Postdisaster Resiliency. *The ANNALS of the American Academy of Political and Social Science*, 192–207. https://doi.org/10.1177/0002716205285533

CROWLEY, H. (2018). *TOWARDS A UNIFORM EARTHQUAKE RISK MODEL FOR EUROPE*. 16th European Conference on Earthquake Engineering, Thesaloniki, Greece. https://hdl.handle.net/10216/133844

Quarantelli, E. L. (Ed.). (2003). Urban vulnerability to disasters in developing countries: managing risks. In *Building Safer Cities* (pp. 211–232). https://books.google.no/books?hl=en&lr=&id=GZG5x6SbeSAC&oi=fnd&pg=PA211&dq=Quarantelli,+2003&ots=afemGipc62&sig=xkMylcH6CufGEEE5iD4rL3fj28k&redir_esc=y#v=onepage&q=Quarantelli%2C%202003&f=false

Web page

Bohle, H. (2020, April 14). *Can resilience be built through micro-finance tools?* Bonndoc. https://bonndoc.ulb.uni-bonn.de/xmlui/handle/20.500.11811/4096

E, A. (2019, November 26). *Situatë dramatike në Thumanë, ulërima dhe frikë për një bilanc tragjik.* Abc News. https://abcnews.al/situate-dramatike-ne-thumane-banoret-ngecin-brenda-godinave-te-rrenuara/

EEFIT - The Institution of Structural Engineers. (2021, April 16). The Institution of Structural Engineers. https://www.istructe.org/get-involved/supported-organisations/eefit/

F. (2014). *View of Participant Observation as a Data Collection Method | Forum Qualitative Sozialforschung / Forum: Qualitative Social Research*. FQS. https://www.qualitative-research.net/index.php/fqs/article/view/466/996

Hoti, B. (2019, November 26). *Zyrtarisht të paktën 9 viktima nga tërmeti, mbi 150 të plagosur. Vijon kërkimi nën rrënoja*. Gazeta Si. https://gazetasi.al/regjistrohet-viktima-e-pare-nga-termeti-300-efektive-ne-durres-dhe-thumane/

IGJEUM. (2019). *Instituti I Gjeoshkencave, Energjise, Ujit dhe Mjedisit. EN: Institute of Geosciences, Energy, Water and Environment, Albania*. Instituti I Gjeoshkencave, Energjise, Ujit Dhe Mjedisit. EN: Institute of Geosciences, Energy, Water and Environment, Albania. https://www.geo.edu.al/site/

International Strategy for Disaster Reduction (ISDR). (2021). International Strategy for Disaster Reduction The Americas. https://www.eird.org/eng/terminologia-eng.htm

Kakofonia e ekspertizave mban pezull të dëmtuarit nga tërmeti në Durrës. (2020, November 27). reporter.al. https://www.reporter.al/kakofonia-e-ekspertizave-mban-pezull-te-demtuarit-nga-termeti-ne-durres/?fbclid=IwAR1AwTgujWyaq5PemwYS53hrhRWid8xuQisC3FSEAAglQJCcBpXyztAL9ME

Luljeta Bozo në një rrëfim ndryshe, gruaja që njohëm pas tërmetit "E Diell", 28 Shkurt 2021. (2021, February 28). YouTube. https://www.youtube.com/watch?v=HhQbyZ6gHoo&ab_channel=TopChannelAlbania

Merriam-Webster. (2021). *Dictionary by*. The Merriam-Webster.Com Dictionary. https://www.merriam-webster.com/

Ministry of Defense. (2019). *NCPA*. The Assembly Of The Republic Of Albania, 2019. Law No. 45, Dated 18.7.2019 “On Civil Protection,” DCM No. 747, Dated 20.11.2019 "On the Organization and Functioning of the National Civil Protection Agency,. https://www.mod.gov.al/index.php/ministria/strukturat-vartese/akmc

Opinion: What We Can Learn From the 2019 Earthquake in Albania. (2020, March 4). UNDRR. https://www.undrr.org/news/opinion-what-we-can-learn-2019-earthquake-albania

Post Earthquake Reconstruction. (2020). Council of Ministries. https://kryeministria.al/newsroom/prezantohen-modelet-e-rindertimit/

Prezantohet projekti i rindërtimit pas termetit, familjet do marrin aq banesa sa kanë kurora. (2020, February 28). YouTube. https://www.youtube.com/watch?v=EfbY6tcjzLg&ab_channel=RTVOra

SED | In General. (2021). SED, ETH Zurich. http://www.seismo.ethz.ch/en/knowledge/things-to-know/causes-of-earthquakes/general/

Shqipëria shkundet nga tërmeti 7.5 ballë, më i fuqishmi në 30 vitet e fundit! Tjetër lëkundje e fortë në mesnatë (VIDEO). (2019). Shqiptarja.com. https://shqiptarja.com/lajm/tirana-shkundet-nga-termeti

Shtesë e rendit të ditës të mbledhjes së këshillit bashkiak, datë 28.06.2021, ora 12:00. (2021). Durres Municipality. https://www.durres.gov.al/

Top Channel Sh.a. (2019, November 26). *TÃ«rmeti qÃ« goditi ShqipÃ«rinÃ«/ Nga lÃ«kundja e parÃ« dhe deri te operacionet e shpÃ«timit nÃ«n rrÃ«noja*. https://top-

channel.tv/2019/11/26/termeti-qe-goditi-shqiperine-nga-lekundja-e-pare-dhe-deri-te-operacionet-e-shpetimit-nen-rrenoja/

USGS. (2019). *M 6.4 - 15 km WSW of Mamurras, Albania*. USGS. https://earthquake.usgs.gov/earthquakes/eventpage/us70006d0m/pager

Report

., Aliaj, S., Muco, B., & Sulstranoca, E. (2010). *Seismicity, seismotectonics and seismic hazard assessment in Albania.* Albanian Academy of Sciences, Tirana.

Bijan Khazai, Fouad Bendimeard, Omar D. Cardona, MarthaLiliana Carreño, Alex H. Barbat and Christopher G. Burton. (2015). *A guide to measuring urban risk resilience*. http://rag.cimne.com/cvdata/cntr1/dtos/img/mdia/Books/PreRelease-Guidebook-on-Measuring-Urban-Risk-and-Resilience.pdf

D83.11 – CM Policy & Legislation report. (2014). United Nations, Driving Innovation in Crisis Management for European. https://driver-project.eu/wp-content/uploads/2017/11/Policy-and-Legislation-report.pdf

EN 1998–1. (2004). *Eurocode 8: Design of structures for earthquake resistance – Part 1: General rules, seismic actions and rules for buildings*. The European Union Per Regulation 305/2011Directive 98/34/EC, Directive 2004/18/EC]. https://www.phd.eng.br/wp-content/uploads/2015/02/en.1998.1.2004.pdf

Environmental Vulnerability Index (EVI) to summarise national environmental vulnerability profiles (No. 275). (1999). Sopac. https://www.um.edu.mt/library/oar/bitstream/123456789/27406/1/Environmental_Vulnerability_Index_%28EVI%29_to_summarise_national_environmental_vulnerability_profiles.pdf

Exposure and vulnerability for seismic risk evaluations. (2018). Stone, H. https://pdfs.semanticscholar.org/e4b0/d599f3c215724c4701f1ea31d4908fe61fde.pdf

Flood site, & Samuels, P. (2005). *Integrated Flood Risk Analysis and Management Methodologies*. 6th framework programme. https://repository.tudelft.nl/islandora/object/uuid:3c7e2768-1628-488d-bc10-e25a6fdf8dcb/datastream/OBJ/download

IFRC. (2016). *World Disasters Report Resilience: saving lives today, investing for tomorrow*. https://www.preventionweb.net/publications/view/50615

ILO Programme on Crisis Response and Reconstruction. (2012). *Pre-Disaster Recovery Planning for Employment and Income*. http://www.recoveryplatform.org/assets/publication/PreDRPEI.pdf

Making Disaster Risk Reduction Gender Sensitive: Policy and Practical Guidelines. (2009). UNISDR. http://repo.floodalliance.net/jspui/handle/44111/1124

Menaxhimi i emergjencave civile ne SHqiperi. (2015). Foto Duro. https://idmalbania.org/wp-content/uploads/2015/03/Menaxhimi-i-Emergjencave-Civile-ne-Shqiperi.pdf

Merita Guri. (2016). *Kerkime mbi teknikat bashkekohore per perforcimin e ndertesave me murature [Research on Contemporary Techniques for Reinforcement of Building with Masonry* (Doctorate Disertation). Polytechnic University of Tirana, Faculty of Construction Engineering.

NPCE- Plani Kombetar per Emergjencat Civile, 2004. Miratuar me VKM nr. 835, dt. 3 Dhjetor 2004. The National Plan on Civil Emergencies. (2004). Council of Ministries. https://www.mod.gov.al/images/ec/Plani-Kombetar-EC.pdf

PDNA, & The World Bank, EU Delegation in Albania, Government of Albania. (2020). *Albania Post-Disaster Needs Assessment (PDNA)* (A). United Nations Albania.

https://albania.un.org/en/46378-albania-post-disaster-needs-assessment-pdna-volume-report-february-2020

Post Disaster Needs Assessment (No. 2). (2020). The world Bank, United Nations Albania, European Union, Council of Ministers Albania. https://ec.europa.eu/neighbourhood-enlargement/sites/near/files/albania_post-disaster_recovery_es_4.1.pdf

SEISMICITY, SEISMOTECTONICS AND SEISMIC HAZARD ASSESSMENT IN ALBANIA. (2010). Shyqyri Aliaj*) Siasi Koçiu Betim Muço Eduard Sulstarova. https://mafiadoc.com/seismicity-seismotectonics-and-seismic-hazard-_5ba9fe3b097c477f068b45c6.html

SLED, Novikova, A., Szalay, A., & Simaku, G. (2015). *The typology of the residential building stock in Albania and the modelling of its low-carbon transformation*. Support for Low-Emssion Development in South Eastern Europe (SLED). http://sled.rec.org/documents/SLED_Albania_BUILDING_ENG.pdf

Tapsell, S., McCarthy, S., Faulkner, H., & Alexander, M. (2010). *Social vulnerability to natural hazards*. https://www.researchgate.net/publication/228612637_Social_vulnerability_to_natural_hazards

UNISDR. (2009). *Making Disaster Risk Reduction Gender Sensitive: Policy and Practical Guidelines*. http://repo.floodalliance.net/jspui/handle/44111/1124

Appendix : Questionnaires

Questionnaire for the affected!

This questionnaire is done for study reasons; your answers will be included in a student study in the master thesis on Urban Ecological Planning and construction safety in Albania, given the events of the November 26th earthquake and the large-scale damage to many residential buildings. The answers will be taken as the basis of the survey, and your name will be completely anonymous! Thank you very much for your help and participation!

1. Name/Surname (optional)
2. Gender ☐ Male ☐ Female
3. Age
4. Do you live in a high-density area (heavily crowded)?
   ☐ Yes ☐ No
5. What disasters affect Albania more often?
6. What disasters affect more the area you live in more?
7. Why do you think Albania is so prone/vulnerable to hazards/ earthquakes?

8. Were you affected by the earthquake of Nivember 26th?
   ☐ Yes ☐ No
9. Have you or your family ever been affected by an earthquake?
   (If yes, please explain the damages to the building)

10. Have you ever participated in or attended an information session about earthquakes?

    ☐ Yes ☐ No
11. How do you classify the seismic risk in the city of Durres?

☐ Very high
☐ High
☐ Moderate
☐ Low
☐ Very low

12. What level of knowledge do you have about disaster management for the protection against earthquakes?

13. Is there disaster management or emergency plan for the area you stay in?
14. Are there laws or policies that deal with disaster management in your country?
15. Has the community created its laws or policies for disaster management

16. Do you have any knowledge about building codes?
17. If possible, would you please respond to some questions about your house?

a) When was the building built?

b) What materials have been used to built it?
c) Was the seismic code respected when building?
d) Has the building been affected in the previous disaster?

18. If your house was affected by the earthquake of November 26th, 2019, please answer:

a) What sort of damages were caused to the building?
b) After the earthquake, was the building checked by a specialist to evaluate the damages?
c) Was the house under living conditions, or did you have to relocate to a safer place to live?
d) Were you able to fix all the damages (if minor) in the house? If yes, did you have any financial support?

19. Is it possible to prevent or manage the inflicted damages in the inability to predict or prevent disasters? If yes, how do you think this could be possible?
20. Do you think that protection against disasters should be left at institutional and state levels, or is community engagement needed and necessary?

Questionnaire for the NGO!

This questionnaire is done for study reasons; your answers will be included in a student study in the master thesis on Urban Ecological Planning and construction safety in Albania, given the events of the November 26th earthquake and the large-scale damage to many residential buildings. The answers will be taken as the basis of the survey, and your name will be completely anonymous! Thank you very much for your help and participation! Ky pyetesor behet per arsye studimi, pergjigjet tuaja do perfshihen ne nje studim studentor ne tezen e masterit mbi Planifikimin Urban dhe sigurine e ndertimit ne Shqiperi. Nisur nga ndodhite e termetit te 27 Nentorit dhe demtimit ne shkalle te gjere te shume ndertesave banimi, eshte menduar te behet ky pyetesor qe te mesohet me teper mbi njohurine e personave te prekur per kete ceshtje! Pergjigjet do merren si baze sondazhi dhe emir juaj do te jete plotesisht anonim! Shume faleminderit per ndihmen dhe pjesemarrjen!

1. What is the primary purpose of your organization? Cili eshte qellimi kryesor i organizates tuaj?
2. Personally, why do you think Albania is so prone/vulnerable to disasters? Personalisht, pse mendoni se Shqipëria është kaq e prirur / e pambrojtur ndaj katastrofave?
3. Based on the work done with your organization, what are some of the deficiencies you have discovered to intervene with the country's vulnerability to earthquakes? Bazuar në punën e bërë me organizatën tuaj, cilat janë disa nga mangësitë që keni zbuluar qe jane fajtore ne prirjen/ pambrojtjen e vendit ndaj tërmeteve?
4. What is your area/zone of focus in the country? Cila është zona / zona juaj e fokusit në vend?

5. What is your strategic plan? Mention some of the projects conducted in the area of focus. Cili është plani juaj strategjik? Përmendni disa nga projektet e kryera në fushën e fokusit.
6. Is the strategy/work plan coordinated with the Office of Civil Emergencies at the Prefecture? A është koordinuar strategjia/plani i punës me Zyrën e Emergjencave Civile pranë Prefekturës?
7. Is the strategy/work plan coordinated/consulted with the National Agency of Civil Emergencies or other institutions at the national level? A është koordinuar/konsultuar strategjia/plani i punës me Agjencinë Kombëtare të Emergjencave Civile ose institucione të tjera në nivel kombëtar?
8. Have you prepared the measures you have taken for crisis management through a work plan or a strategy with concrete actions for crisis management? Masat që keni marrë për menaxhimin e krizës, a i keni përgatitur përmes një plani pune apo një strategji me veprime konkrete për menaxhimin e krizës?
9. Have you approved the work plan or strategy in the municipal council? A e keni miratuar planin e punës ose strategjinë në këshill bashkiak?
10. Has the strategy been made public and accessible to citizens? A është bërë strategjia publike dhe e aksesueshme për qytetarët?

11. To your knowledge, are there civic, civil society, or local business initiatives providing crisis management assistance? Në dijeninë tuaj, a ka iniciativa qytetare, të shoqërisë civile apo të bizneseve lokale që ofrojnë ndihmë për menaxhimin e krizës?
12. How involved is your organization on the community scale? Sa e përfshirë është organizata juaj në shkallën e komunitetit?
13. Has the organization conducted evaluation surveys about the community's vulnerability to earthquakes? A ka kryer organizata sondazhe vlerësimi në lidhje me ndjeshmërinë e komunitetit ndaj tërmeteve?
14. What level of involvement does the organization have in disaster management for the protection against earthquakes? Çfarë niveli të përfshirjes ka organizata në menaxhimin e katastrofave për mbrojtjen nga tërmetet?

15. How can we reduce the community risk to hazards? Si mund ta zvogëlojmë rrezikun e komunitetit ndaj rreziqeve?
16. Do you have any knowledge about building or seismic codes? If yes, do you think that building and seismic code has a prime role in the disaster risk reduction against earthquakes? A keni njohuri rreth ndërtimit ose kodeve sizmike? Nëse po, a mendoni se ndërtimi dhe kodi sizmik ka një rol kryesor në zvogëlimin e rrezikut të katastrofës kundër tërmeteve?
17. What is your opinion about the community involvement in the measures taken in building resilience against natural hazards? Cili është mendimi juaj për përfshirjen e komunitetit në masat e marra në ndërtimin e rezistencës ndaj rreziqeve natyrore?
18. What is the project you are working on currently? Cili është projekti për të cilin po punoni aktualisht?
19. How can your organization involve the community in the projects you are working on? Si mund ta përfshijë organizata juaj komunitetin në projektet për të cilat po punoni?

Questionnaire for the governmental institutions

This questionnaire is done for study reasons; your answers will be included in a student study in the master thesis on Urban Ecological Planning and construction safety in Albania, given the events of the November 26th earthquake and the large-scale damage to many residential buildings. Therefore, the answers will be taken as the basis of the survey, and your name will be completely anonymous! Thank you very much for your help and participation!
Ky pyetesor behet per arsye studimi, pergjigjet tuaja do perfshihen ne nje studim studentor ne tezen e masterit mbi Planifikimin Urban dhe sigurine e ndertimit ne Shqiperi. Nisur nga ndodhite e termetit te 27 Nentorit dhe demtimit ne shkalle te gjere te shume ndertesave banimi, eshte menduar te behet ky pyetesor qe te mesohet me teper mbi njohurine e personave te prekur per kete ceshtje! Pergjigjet do merren si baze sondazhi dhe emir juaj do te jete plotesisht anonim! Shume faleminderit per ndihmen dhe pjesemarrjen!

1. Personally, why do you think Albania is so prone/vulnerable to earthquakes? Personalisht, pse mendoni se Shqipëria është kaq e prirur / e pambrojtur ndaj termeteve?
2. Based on the work done by the municipality, what are some of the deficiencies you have discovered to intervene with the country's vulnerability to earthquakes? Bazuar në punën e bërë nga bashkia, cilat janë disa nga mangësitë që keni zbuluar qe jane fajtore ne prirjen/ pambrojtjen e vendit ndaj tërmeteve?
3. What is the area/zone of focus in the country? Cila është zona / zona e fokusit në vend?
4. What has been the strategic plan of the municipality concerning hazard/ earthquake protection and preparedness? Mention some of the projects conducted in the area of focus. Cili është plani strategjik ne lidhje me mbrojtjen dhe pregatitjen ndaj katastrofave natyrore/ termeteve? Përmendni disa nga projektet e kryera në fushën e fokusit.
5. To your knowledge, are there civic, civil society, or local business initiatives providing crisis management assistance? Në dijeninë tuaj, a ka iniciativa qytetare, të shoqërisë civile apo të bizneseve lokale që ofrojnë ndihmë për menaxhimin e krizës?
6. How involved is the municipality on the community scale? Sa e përfshirë është bashkia në shkallën e komunitetit?
7. Has the strategy/ work plan been made public and accessible to citizens? A është bërë strategjia/ plani i punes publike dhe e aksesueshme për qytetarët?
8. How can we reduce the community risk to hazards? Si mund ta zvogëlojmë rrezikun e komunitetit ndaj rreziqeve?
9. Do you have any knowledge about building or seismic codes? If yes, do you think that building and seismic code has a prime role in the disaster risk reduction against earthquakes? A keni njohuri rreth ndërtimit ose kodeve sizmike? Nëse po, a mendoni se ndërtimi dhe kodi sizmik ka një rol kryesor në zvogëlimin e rrezikut të katastrofës kundër tërmeteve?
10. Has the municipality undergone any projects or programs related to the building environment protection/ building code integration into the contingency plans? If yes, can you elaborate? A eshte perfshire bashkia ne plane ose projekte ne mjedisin e ndertimit/ ne integrimin e kodeve/ rregullave te ndertimit ne planet e emergjences civile? Nese po, a mund te elaboroni me tej?

Questionnaire for the construction companies

This questionnaire is done for study reasons; your answers will be included in a student study in the master thesis on Urban Ecological Planning and construction safety in Albania, given the events of the November 26th earthquake and the large-scale damage to many residential buildings. Therefore, the answers will be taken as the basis of the survey, and your name will be completely anonymous! Thank you very much for your help and participation!
Ky pyetesor behet per arsye studimi, pergjigjet tuaja do perfshihen ne nje studim studentor ne tezen e masterit mbi Planifikimin Urban dhe sigurine e ndertimit ne Shqiperi. Nisur nga ndodhite e termetit te 27 Nentorit dhe demtimit ne shkalle te gjere te shume ndertesave banimi, eshte menduar te behet ky pyetesor qe te mesohet me teper mbi njohurine e personave te prekur per kete ceshtje! Pergjigjet do merren si baze sondazhi dhe emir juaj do te jete plotesisht anonim! Shume faleminderit per ndihmen dhe pjesemarrjen!

1. What is the name of the company you represent and the main focus on the types of construction the company works on? Cili është emri i ndërmarrjes që ju përfaqësoni dhe fokusi kryesor në llojet e ndërtimit në të cilin punon kompania?
2. What kind of materials are currently used by your company in construction? Çfarë lloj materialesh përdoren aktualisht nga kompania juaj në ndërtim?
3. What precautions can be taken to increase the safety of a structure in an earthquake-prone area? What are some earthquake-resistant building techniques your company uses during construction? Cilat masa paraprake mund të merren për të rritur sigurinë e një strukture në një zonë të rrezikuar nga tërmeti? Cilat janë disa teknika ndërtimi rezistente ndaj tërmeteve që përdor kompania juaj gjatë ndërtimit?
4. Does the company work by following the regulations and building codes? A punon kompania duke ndjekur rregulloret dhe kodet e ndërtimit?
5. What are some of the seismic codes you apply to the building construction process? Cilat jane disa nga kodet sismike qe aplikoni gjate procesit te ndertimit?
6. What kind of assessment is done to the terrain by the company before the start of the construction? Çfarë lloj vlerësimi i bëhet terrenit nga kompania para fillimit të ndërtimit?
7. What are some of the prequisitions required from the responsible governmental institutions concerning construction companies and the building and seismic codes? Cilat janë disa nga parakushtet që kërkohen nga institucionet shteterore përgjegjëse në lidhje me kompanitë e ndërtimit dhe respektimin e kodeve sizmike dhe te ndërtimit?

a) Do you get any controls by the governmental institutions regarding the correct use of the building and seismic codes? A merrni ndonjë kontroll nga institucionet qeveritare në lidhje me përdorimin korrekt të ndërtesës dhe kodeve sizmike?

8. The building and the seismic codes in Albania have not been updated since 1989. As a professional, can you express your own opinion regarding this? Kodet sizmike dhe te ndertimit në Shqipëri nuk janë azhurnuar që nga viti 1989. Si profesionist, a mund të shprehni mendimin tuaj në lidhje me këtë?
9. Do you think that building and seismic code has a prime role in the disaster risk reduction regarding earthquakes? A mendoni se kodet sizmike dhe te ndërtimit kane një rol kryesor në zvogëlimin e rrezikut të katastrofës ndaj tërmeteve?

10. What are some of your recommendations regarding what could be added to the current building and seismic codes to ensure better protection on buildings? Cilat janë disa nga rekomandimet tuaja në lidhje me atë që mund t'i shtohet kodeve aktuale sizmike te ndertimit për të siguruar mbrojtje më të mirë të ndërtesave?
11. What are some of your recommendations regarding seismic building retrofitting? Cilat janë disa nga rekomandimet tuaja në lidhje me rikonstruksionin e ndërtesave sizmike?