

REPORT ON COLLECTED NORMS AND INCENTIVES



WPT1 – Harmonization of regulative and incentive-based approaches

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Document Information

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Description of the deliverable (3-5 lines)	The report contains references to all the norms, planning rules and financial and economic incentives collected within the partnership countries
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Definitions & Acronyms

Acronym	Full name
CA	Consortium Agreement
PP	Project Partner
LP	Lead Partner
WPT	Technical Work Package

Executive summary

The main purpose of the Technical Work Package 1 is to establish a common reference framework concerning regulative, operational and economic-financial instruments of seismic vulnerability and its reduction in the Adriatic and Ionian area, by harmonizing the different instruments and approaches. The first activity, A.T1.1: Collection and systematization of norms and incentives, aims at collecting, analysing and systematizing current national and/or local planning and regulatory instruments and approaches to seismic norms and incentives, seismic vulnerability standards as well as related financial and economic incentives in each involved Partner State.

To achieve the overall objective of the work package, ADRISEISMIC has firstly developed an in-depth study of the existing regulations in the Countries involved regarding the reduction of seismic vulnerability on existing buildings and related forms of financial and economic incentives. A particular attention has been paid at collecting specific regulations and tools addressing the historical parts of the cities, intended as the more fragile but at the same time the richest of cultural heritage.

In order to achieve the best possible comparability between countries, while incorporating as much existing documentation as possible and obtaining its detailed data, it was decided to collect the data in the form of a survey, which has been conducted in two phases. The type of collected material varies from e.g., laws, regulations, incentives, guidelines, manuals, instructions to applications and tools. In the first phase, a basic survey to get a general insight into the current situation in all project partner countries has been prepared. After receiving the first results, the evaluation phase started. With the aim of comparability and obtaining as much information as possible about the existing material, the 2nd stage survey proceeded from the 1st stage survey.

Basic topics for the collection have been selected. Besides basic information about the country, there were six content topics determined, namely seismic norms, building regulations, urban planning regulation, seismic incentive frameworks, post-earthquake planning and insurance against earthquake. For each of the norms/incentives from the above mentioned topics the information on the following data has been collected: since when the document is in force, if the document relates to the EU regulatory framework, the level at which is valid, who is the promoter and who are the target groups of the document, which period (pre-7post-earthquake) does it relate to, whether it addresses cultural heritage, etc. For each of the topics, each project partner country provided a brief summary of the current state of norms and incentives in the country and an indication of whether all existing documents are actually included in the survey.

In the report, a summary of the first results of collecting existing norms and incentives in all project partner countries is presented in general and per each country separately in dependence on the topic among which the documents are listed. A total number of 88 has been collected, highlighting the high level of complexity that characterizes the seismic vulnerability at urban scale.

Some general findings on the situation in the main topics covered can be drawn. Among the topic of **seismic norms** European Eurocode standards are currently in force in all partner countries. In general, regulation on the national level prevails. All project partner countries have listed **building regulations** in force at national level. Each project partner country has one document representing “national building law”. Only in Italy,

alongside the national legislation, it is possible to find building regulations enacted at a local scale, namely the municipal level. In dealing with the field of *urban planning regulations* the laws enacted at national level concerning spatial planning and affecting seismic vulnerability have been inserted for every project partner country. Whereas urban planning is a matter of regions, only instruments in force in those ones interested by the ADRION programme have been considered in the survey. As far as seismic incentive frameworks are concerned, only Italy has financial and economic incentives, while Greece and Slovenia collected some incentives, which help in raising awareness of the seismic vulnerability of built environment. Other countries have no existing (in)direct incentives. On the other hand, all project partner countries have *post-earthquake planning* documents, which are in force at national, regional and/or municipal level and which represent action plans in case earthquake/natural disasters happen. Some of the laws among this topic refer to reconstruction of specific territory after an earthquake. *Insurance against earthquake* is not obligatory in any of the project partner countries. Optional insurance against earthquake is available in all PP countries. Countries provided slightly different data on the conditions and characteristics of voluntary earthquake insurance.

The collected data represent the first picture of the situation in the considered area. All in all, it will be a good basis for further activities within WPT1. The first one of the latter is a comparison matrix, presented in detail in Deliverable T1.1.2. It should be noted that the report has so far included documents collected within project partner countries by the end of January 2021. It is expected that during the project and especially if there is the event of seismic activity in the ADRION area, the collection of norms and incentives will be further supplemented.

1. Introduction

The ADRION area is heavily subject to natural hazards, and it is the European area with the highest seismic vulnerability. The high vulnerability of the area is due not only to the severity of earthquake events, but also to the high population density and to the important value of the Cultural and Natural Heritage, confirmed by a large number of UNESCO World Heritage Sites and UNESCO Geoparks.

The lack of homogeneous and comparable policies for addressing seismic risk prevention is among the three main challenges ADRISEISMIC project aims to tackle. In this framework, the main purpose of the WPT1 “Harmonization of regulative and incentive-based approaches” is to establish a common reference framework concerning regulative, operational and economic-financial instruments of seismic vulnerability and its reduction in the Adriatic and Ionian area, by harmonizing the different instruments and approaches.

The reference context is the current European and National legislations and any further reference (i.e., Guidelines, recommendations, fiscal incentives) to reduce seismic vulnerability by programming anti-seismic interventions.

WPT1 consists of three activities through which the main goal will be achieved.

This first activity, **A.T1.1: Collection and systematization of norms and incentives**, aims at collecting, analysing and systematizing current national and/or local planning and regulatory instruments and approaches to seismic norms and incentives, seismic vulnerability standards as well as related financial and economic incentives in each involved Partner State. The aim is to establish a shared approach to the problem of seismic vulnerability and its reduction, in order to allow planning interventions for vulnerability reduction, to be based on the same reference standards, and therefore ensure a higher security and quality of the living environment, reducing risks for people and the environment.

In the next activity, **A.T1.2: Assessment and systematization of norms and incentives**, the project will systematize the collected norms, identifying gaps and good practices in order to share uniform reference standards among the partnership. Thanks to the comparison matrix (D.T1.1.2), the norms and incentives collected during the previous activity will be deeply analysed and gaps and good practices will be identified within the regulative and normative tools of the involved Countries. This activity will lead to the definition of common normative and regulative advanced standards for seismic vulnerability reduction (D.T1.2.1) by capitalizing existing good practices, such as the excellence of some regulative frameworks concerning the recovery of many urban centers and buildings that have been damaged after significant seismic events, as well as notable urban planning tools and regulations, such as the restoration plans of the historical centers. This activity will lead to the definition of 6 Roadmaps (D.T1.2.2), one for each Country involved in ADRISEISMIC, tailored thanks to the local workshops in A.T1.3.

Finally, within the last activity, **A.T1.3: Tailoring and validation of common standards for norms and incentives**, ADRISEISMIC will define specific recommendations for improving norms and incentives for reducing seismic vulnerability of urban centres at national and regional levels, with special regards to those Countries where those instruments will emerge as less effective. This activity runs in parallel with the previous one and is aimed at validating and tailoring the common advanced standards sketched in A.T1.2 within the specific territorial contexts. Notably this activity will finalize the systematization of legislative, regulative and

financial instruments performed at national/local level by involving local stakeholders and TGs as well as the Associate Partners through 4 specific local workshops with the aim of assessing the feasibility of the proposed approaches and to identifying pathways to influence the current practices and rules for seismic retrofitting and seismic vulnerability reduction in each Country involved. This activity will tailor the contents of the 6 Roadmaps that will be finalized in A.T1.2 (D.T1.2.2).

While all PPs are involved in the collection of norms and incentives in place within their own Countries, the Universities and research centres (LP, PP6-7) will be primarily involved in systematizing and assessing current norms and incentives, while territorial bodies and administrations (PP3,4,5,8) will be primarily involved in identifying how to improve their norms and procedures with the aim of a higher harmonization and standard of the regulations for increasing the effectiveness of seismic retrofitting.

To achieve the overall objective of the work package, ADRISEISMIC has firstly developed an in-depth study of the existing regulations in the Countries involved regarding the reduction of seismic vulnerability on existing buildings and related forms of financial and economic incentives. Particular attention has been paid at collecting specific regulations and tools addressing the historical parts of the cities, intended as the more fragile, but at the same time, the richest of cultural heritage.

This report represents an important step to acquire key knowledge to understand the regulative and incentive-based approaches of the ADRISEISMIC six involved countries. Together with the Deliverable T1.1.2 Comparison Matrix, it will be used as the starting point for the further project activities to assess and systematise the regulatory, policy and planning framework. It will ultimately guide policy-makers towards the improvement of their regulative framework, to ensure the common challenge of seismic vulnerability reduction is addressed.

Deliverable T1.1.1 presents a report on norms and incentives collected within the first activity of the WPT1. The collection of all the existing norms and incentives has been carried out in all participating countries: Italy, Croatia, Albania, Serbia, Slovenia and Greece.

In the following, Chapter 2 presents all the main topics that represent the basis for collecting the norms and incentives and concern the reduction of seismic vulnerability of the built environment.

Chapter 3 is devoted to the presentation of the data collection methodology and it includes a detailed description of each step. The timetable of all activities performed within A.T1.1 is presented, as well as the content of the survey intended for the collection of norms and incentives.

Chapter 4 summaries the existing situation in each of the participating countries for each of the main topics.

In conclusion, the main findings and facts related to the data collection are presented.

The annexes contain all the original latest versions of the 2nd stage survey for each of the participating countries.

2. Topics related to the reduction of seismic vulnerability

Seismic vulnerability can be considered as the intrinsic property of a certain element to suffer damage result of a seismic event. It is surely related with building characteristics, however the building elements alone are not able to provide a full picture of the phenomenon. The characteristics of cities, and particularly of historic areas, should also be considered, since the relations among the various elements of the build environment is also contributing to determine seismic vulnerability of urban areas. Therefore, to building a comprehensive understanding on the regulatory framework currently in force in the ADRISEISMIC countries, the collection of norms and regulations should encompass a wide range of topics, able to capture the state of the art from the building scale, to the urban one.

Moreover, although the prevention phase might be considered the most relevant to reduce seismic vulnerability, the investigation should include norms and tools addressing the other phases of disaster risk management, since they can, in turn, inform the prevention phase.

For the purpose of the Activity T1.1 within WPT1, specific topics have been identified in order to provide as best as possible an overall picture of the regulatory framework for the reduction of seismic vulnerability of built environment in all project partner countries. Past experience and research in this field indicate the main topics that can contribute to the desired goal from various perspectives. In order to systematically collect existing norms and incentives in all participating countries, six topics, common to all project partner countries have been identified. Each of the topic can – as long as there are appropriate norms, incentives or other tools – make a decisive contribution to reduce seismic vulnerability. For the purpose of this activity, the following topics have been determined:

- **Seismic norms**
- **Building regulations**
- **Urban planning regulation**
- **Seismic incentive frameworks**
- **Post-earthquake planning**
- **Insurance against earthquakes**

In the following, each subchapter is dedicated to one of the topics listed above. Explanations are given to describe the relevance of each topic and how it contributes to reduce seismic vulnerability. It should be emphasized that we are primarily interested in those norms and incentives related to the reduction of seismic vulnerability.

2.1 Seismic norms

Seismic vulnerability is affected by several factors. Based on the location of the building, the local seismic hazard is determined. On the other hand, materials, geometry, technology and quality of construction largely determine the seismic resistance of the building. When building is located in the region with high seismic risk, it is extremely important to take this aspect into account (Figure 1).

The topic seismic norms is dedicated to all regulations and other existing documentation dealing with the design of new structures and assessment of existing ones taking into account their seismic resistance. Seismic norms are type of building documents designed to protect property and life in buildings in the event of an earthquake. Seismic norms were created and developed in response to earthquakes that occurred in the past and caused enormous damage, especially to densely populated urban centers. Some destructive earthquakes have been the reason for first explicit policy and legal consideration of the seismic safety of structures such as e.g. the 1908 Messina earthquake resulted in the first Italian Seismic Code in 1909 [1], also one year after the 1963 Skopje earthquake, the first Yugoslavian Code for Construction in Seismic Regions (temporary code 1964), was prepared by a committee consisting of international and national experts [2]; The first code for seismic-resistant design for Greece was published in 1959 (Royal Decrees 1959) [3].

Often, seismic norms are thus based on knowledge acquired after earthquakes as well as on laboratory and field research studies. While the goal of such norms is usually to prevent the collapse of buildings and thus casualties, there is an increasing tendency for buildings to be designed to remain usable even after the strongest expected earthquake.

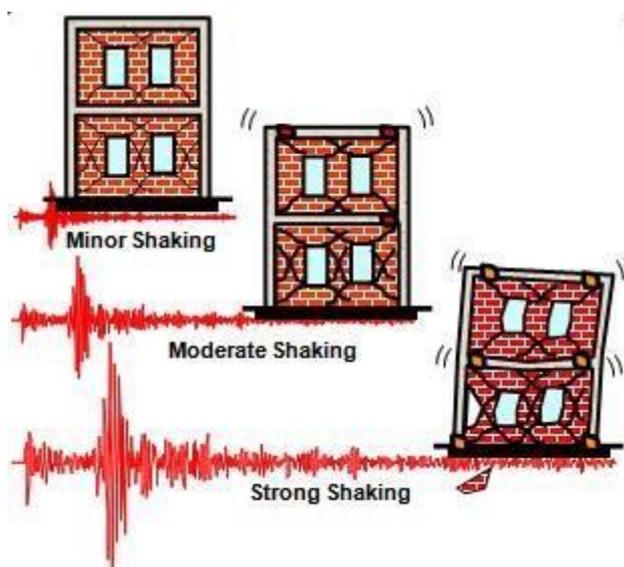


Figure 1: Example of building response taking into account the requirements of seismic norms [4]

2.2 Building regulations

In this category, all the documents providing general rules and building codes for the construction of new buildings have been collected, together with the procedures that can be applied to the transformation of the existing building stock.

Today building regulation represents an opportunity for local governments to conduct significant improvements in the application of measures to intervene on existing buildings [5] since these institutions have the possibility to set through this document in which way it is possible to operate to achieve a more resilient built environment. Building regulations have indeed recently been adopted for encouraging urban

regeneration practices, also including the regulative framework for the application of incentives in case of adoption of seismic reduction interventions [6].

Dealing with a set of rules to be followed when intervening on buildings, this category is the most punctual one when it comes to the definition of the possible interventions on the built environment, mostly referred to the building scale.

The collection of this type of document in the framework of ADRISEISMIC project is considered relevant to establish which building rules and codes are in force in the different countries involved in the project and to investigate how seismic vulnerability reduction is addressed, especially when it comes to historical buildings in historical areas.

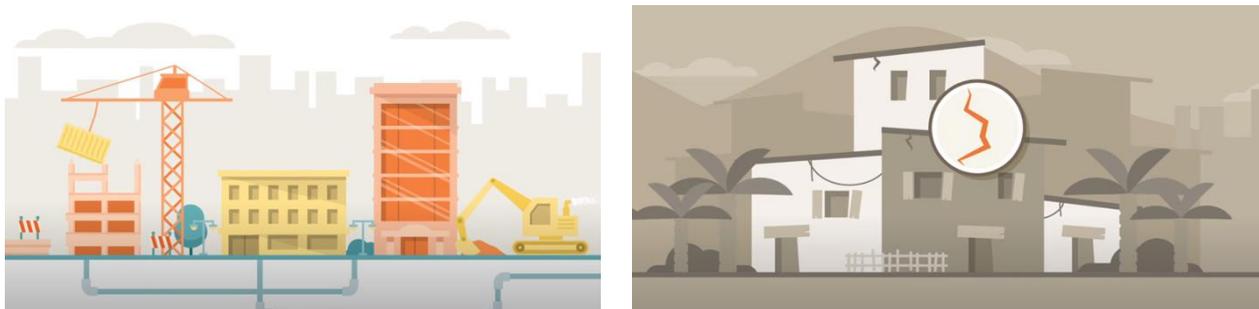


Figure 2: Building regulations [7]

2.3 Urban planning regulations

The urban planning regulation category includes those laws, policy and planning instruments in force to manage the urban planning and the sustainable development of urban areas. In the last decades, one of the pillars for sustainable development of cities has been the disaster risk reduction [8], and spatial planning is increasingly considered as one of the most important instruments to reduce the vulnerability of the built environment to natural hazards, to turn cities into more resilient environments [9]. Since urban planning regulations are in force to stand the utilisation of land, including seismic vulnerability analysis, targeted development strategies in urban plans can reduce the exposure of the involved assets to the risk and, consequently, their vulnerability to earthquake effects.

Urban planning tools seldomly include the topic of disaster risk reduction [10], but these instruments can represent the opportunity to transform building aggregates and urban areas in those ones able to tackle seismic vulnerability through the integration of the concept of prevention of seismic risk and rescue within the urban planning regulations by reducing the exposure of heritage buildings [11].

Under the umbrella of urban planning regulation category, both national and regional laws in force in the six project partner countries have been collected, according to the most appropriate territorial scale of the planning instruments that varies from country to country.



Figure 3: Urban planning regulations [12]

2.4 Seismic incentive frameworks

Economic-related barriers are one of the most frequent impediments inhibiting seismic retrofitting interventions [13]. Although European cities are in large parts located in seismic-prone areas, seismic vulnerability reduction measures still have a low rate of occurrence if compared, for instance, to the other important class of interventions that can improve the performance of the built environment that deals with the reduction of energy consumption [14].

In this framework, economic and volumetric incentives represent an important instrument to increase the diffusion of seismic vulnerability reduction interventions, especially if combined with informative campaigns aimed at raising awareness towards seismic safety [15] [16].

In addition to financial and economic incentives that directly contribute to reducing the seismic vulnerability of the built environment, incentives that indirectly contribute to this goal could be added to this topic (e.g., various publicly funded projects and their results, instructions, manuals, tools, applications, etc.). Such documents primarily help to raise people's awareness of the seismic vulnerability of the built environment.

In order to distinguish between the so-called direct and indirect incentives, subchapters in this area, financial and economic incentives and raising awareness have been introduced.



Figure 4: Seismic incentive frameworks [17]

2.5 Post-earthquake planning

The topic post-earthquake planning covers all activities related to the optimization of the seismic response and at the same time supports the awareness of various stakeholders about possible scenarios in the event of an earthquake. Disaster preparedness consists of a set of measures undertaken by governments, organisations, communities or individuals to better respond and cope with the immediate aftermath of a disaster, whether it be man-made or caused by natural hazards. The objective is to reduce loss of life and livelihoods. Simple initiatives can go a long way, for instance training for search and rescue, establishing early warning systems, developing contingency plans, or stockpiling equipment and supplies. Disaster risk reduction and preparedness plays an important role in building the resilience of communities [18].

Many documents among this topic represent plans for how to react in the event of a natural / human / technology-caused event, where each type of disaster is discussed in more detail, including the response to a natural disaster - an earthquake.

The existing norms, incentives and tools help to reduce seismic vulnerability of built environment. The topic covers a wide area. The latter includes general legislation relating primarily to civil protection and its duties in the event of an earthquake.

Also, various educational programs that contain information on a better response to earthquakes should be included. A special place in this area is represented by various protection and rescue plans and seismic risk assessments. There are also various tools (e.g., applications, simulations) to help raise awareness of seismic hazard, with the help of which we learn about the seismic vulnerability of a particular building. In addition to the above, this area also includes other norms and incentives that regulate the situation in the field of our awareness and response in the event of an earthquake.

There are also some of the legislative documents accepted within the European regulatory framework, which are in force in order to provide assistance for the affected countries and populations, e.g. The EU Civil Protection Mechanism has been activated to assist Croatia in the aftermath of a 6.4 magnitude earthquake, following a request for assistance from Croatian authorities on 29 December 2020 [19].



Figure 5: Post-earthquake planning [20, 21]

2.6 Insurance against earthquakes

Insurance against earthquakes is a form of property insurance that pays a policy holder in the event of an earthquake that causes damage to the property. In the past, earthquake loss was assessed using a collection of mass inventory data and was based mostly on experts' opinions. Today it is estimated using a Damage Ratio (DR), a ratio of the earthquake damage money amount to the total value of a building [22].

Earthquake insurance can cover damage to a home, personal belongings and some other expenses in a case that earthquake happens. As earthquakes can cause harm to home structures. The topic does not directly contribute to the reduction of seismic vulnerability. But in case, earthquake happens, there is a great opportunity to be able to finance seismic strengthening of the property. We should ask ourselves few questions [23]:

- Can we afford the cost of rebuilding or repairing our home if it is damaged?
- Can we replace our personal belongings if they are damaged or destroyed?
- Can we afford to pay for temporary housing and other expenses if structural damage makes our home uninhabitable?

On the other hand, it makes sense to recalculate whether our building is in an earthquake-prone area, i.e. what is the expected strongest earthquake at the location. It is necessary to determine whether the taking out insurance against earthquake is a sensible option for each individual case.

At this point, we emphasize that, given the possibilities offered by insurance against earthquake, this is certainly one of the topics covered in this WP, despite being a bit different from the rest of the topics, as it is not of such an architectural-technical type. Namely, insurance against earthquake contributes to our financial capacity to reduce the seismic vulnerability of the building in the event of possible future earthquakes.



Figure 6: Insurance against earthquakes [24]

3. Data collection methodology

To achieve the overall objective of the work package, ADRISEISMIC has firstly developed an in-depth study of the existing regulations in the Countries involved regarding the reduction of seismic vulnerability on existing buildings and related forms of financial and economic incentives. A particular attention has been paid at collecting specific regulations and tools addressing the historical parts of the cities, intended as the more fragile but at the same time the richest of cultural heritage.

3.1 Methodology

The aim of the first activity within the work package was to collect existing norms and incentives for the purpose of reducing seismic vulnerability in all PP countries. It is important to emphasize that the results of this activity are the basis for all further activities of the work package. In order to achieve the best possible comparability between countries, while incorporating as much existing documentation as possible and obtaining its detailed data, it was decided to collect the data in the form of a survey.

The survey has been conducted in two phases. In the first phase, a basic survey has been prepared. After receiving the first results, the evaluation phase started. With the aim of comparability and obtaining as much information as possible about the existing material, the 2nd stage survey has been formed on the basis of the 1st stage survey. The material collected in the latter forms the basis for this deliverable.

As part of this activity, all the norms and incentives that are currently in force in each PP country have been collected. The type of collected material varies from e.g., laws, regulations, incentives, guidelines, manuals, instructions to applications and tools.

3.2 Data collection timeline

Figure 7 shows the timeline within activity T1.1 to achieve deliverable D T1.1.1. The individual steps for creating a collection of existing norms and incentives of all partner countries are shown.

Data collection steps, their time frames and the content are listed below:

- In accordance with the Application form, in March and April 2020, ZAG has started with a selection of content considered to be key within WPT1. The main topics among which the documentation should be collected, has been selected. A survey, which consisted of an introductory chapter, intended to collect general data on each PP country and 5 content chapters has been formed.
- At the beginning of May 2020, the 1st stage survey and instructions for its completion have been presented at the consortium meeting of all PPs. The survey has been sent to all PPs.
- In June and early July 2020, norms and incentives that fall into selected topics, were being collected in all partner countries and all the 1st stage surveys were completed.
- In July 2020, ZAG has received the completed 1st stage surveys from all participating countries. All collected norms and incentives were reviewed and the starting points for the design of the 2nd stage

survey were prepared. The 2nd stage survey was designed individually for each country, and proceeded from the completed 1st stage survey. Country-specific comments and desired additions have been added. In addition to the above, one of the considered topics was divided into two topics, which enabled more efficient and clearer post-processing of the collected data. The aim of the content of the 2nd stage survey was to achieve the best possible comparability between countries and to obtain all existing documents from the topics covered.

- In August 2020, ZAG forwarded the 2nd stage survey to all PP countries.
- The submitted survey was presented in more detail at the September consortium meeting. By the end of October 2020, all PP countries have completed the survey.
- In November and December 2020, ZAG studied the collected 2nd stage surveys and prepared some additional guidelines.
- In December 2020, the basic results of data collection were presented at the consortium meeting. All PP countries were invited to review their 2nd stage survey in order to better specify which norms and incentives do not address seismic issues in their content and thus do not contribute in their current form to reduction of the seismic vulnerability of the built environment. However, these documents have been preserved in the survey with the purpose of defining a clear framework of the current regulations in force in the different sectors and in the different countries. This will generate a knowledge background useful for identifying the target document to which address the implementation of the good practices to be identified in the activity T1.2.
- In January and February 2021, all 2nd stage surveys have been reviewed in detail. Subsequently, all the collected documentation has been processed and, on the basis of the latter, a report on the collected norms and incentives in all participating PP countries has been prepared.

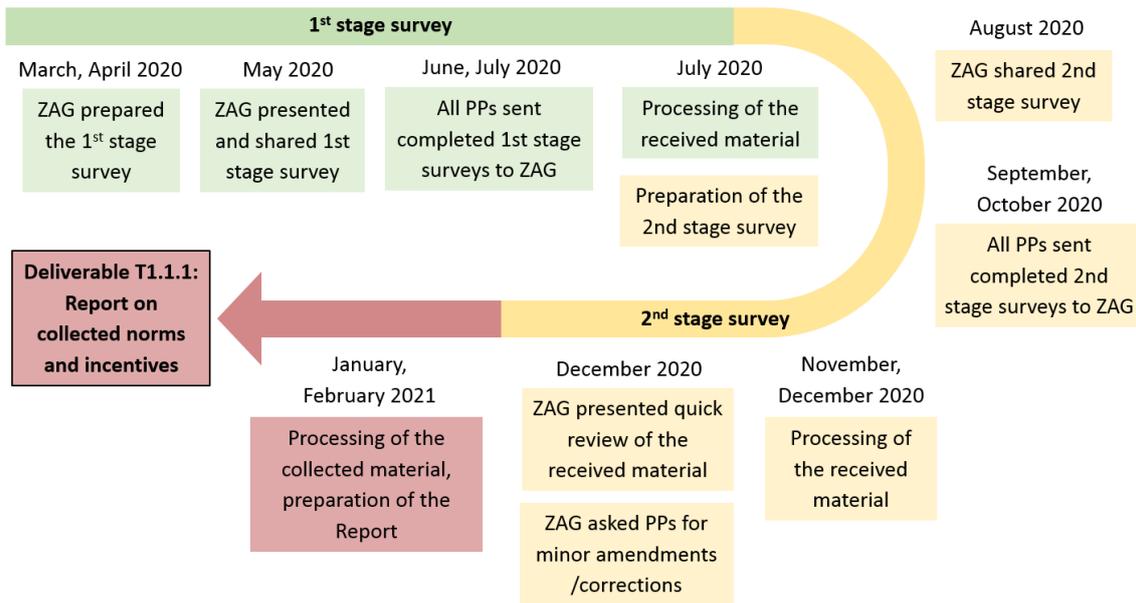


Figure 7: Timeline of the Activity T1.1.

3.3 First and second stage surveys

In the first step, as part of the activities of the WPT1, the 1st stage survey has been prepared by ZAG. It has been prepared in order to help project partners within ADRISEISMIC project to get a first feedback on current national and/or local planning and regulatory instruments and approaches to seismic norms and incentives, seismic vulnerability standards as well as related financial and economic incentives in each involved Partner State. It was the framework for the 2nd stage survey.

The 1st stage survey consisted of the following chapters:

1. An introductory chapter with basic information about the project partner country.
2. Five chapters that relate to specific topics in which the collected norms and incentives can be classified:
3. seismic norms,
4. building regulations,
5. urban planning regulation,
6. seismic incentive frameworks,
7. insurance against earthquake (optional & general legislation).

First three substantive chapters were structured similarly, while the other two chapters were a bit more detailed.

The results (collected documentation) of the 1st stage survey presented the basis for the 2nd stage survey. The latter was prepared in order to help project partners within ADRISEISMIC project to get more detailed and at the same time comparative information on existing national and/or local planning and regulatory instruments and approaches to seismic norms and incentives, seismic vulnerability standards as well as related financial and economic incentives in each involved Partner State.

As already mentioned, the 2nd stage survey proceeded from the 1st stage survey. The documents, provided by each PP country, have been processed by ZAG. For each PP country, the submitted document (of the 1st stage survey) remained the same but had some changes/updates. The 2nd stage survey was prepared in a way that some of the information, provided by each project partner, needed further explanation and it varied between PP countries.

For every PP country, an extension at the beginning of each topic has been added so that each project partner had the possibility to implement a short description of the current situation regarding this topic in his PP country. This information will be useful for the upcoming comparative activities. Moreover, an additional table at the end of each topic has been inserted aiming at clarifying if the collected materials represented all the existing documents in force in the country or just a selection of them. In this case, the rationale behind the selection has been provided in the same table.

During the review of the received material from the 1st stage survey it has been found out that the topics were properly selected, so they were kept for the 2nd stage survey. There was only one novelty. There have been some differences in the interpretation of the topic "**Seismic incentive frameworks**". We have tried to arrange these matters in a way that the interpretation is consistent for all PPs. The documents, which have so far been included in the Seismic incentive frameworks, contained both incentives (pre-earthquake, prevention measures) as well as actions/plans in case of earthquakes. In order to avoid confusion, the chapter "**Seismic incentive frameworks**" was intended for the purpose of the 2nd stage survey only for incentives (pre-earthquake, prevention measures, e.g., documents in the field of economic incentives, financial funds). All documents prepared in order to respond better in the event of an earthquake (e.g., civil protection plans) should be classified in new topic "**Post-earthquake planning**".

When it comes to the content of the survey, in the first section some basic general information about project partner country and its seismic activity was needed. Information on the size of the country, the number of inhabitants, the administrative division of the country and on past major earthquakes occurred has been collected. In the continuation of the activities of this work package, the mentioned information will help to clarify some differences and similarities between the existing regulations and incentives of individual partner countries.

The following is the substantial part of the survey. The 2nd stage survey consists of 6 chapters dedicated to 6 topics that, are the key to reduce the seismic vulnerability of the built environment. For each of the norms/incentives from the topic of seismic norms, building regulations, urban planning regulation, seismic incentive frameworks and post-earthquake planning, the information on the following data has been collected:

- since when (the latest version) the document is in force
- given that some regulations are prescribed by the EU, whether the document relates to the EU regulatory framework
- the level at which the document is valid - this should be linked to the administrative division of the country
- information about the promoter of the document
- target groups - the target users of the document

- in case the collected norm/incentive is publicly available online, a link to the document must be provided in the survey
- which time period the document relates to (whether pre- or post-earthquake period or both)
- whether the document specifically addresses cultural heritage
- a short description of the document had to be added, together with an explanation of how the document addresses seismic vulnerability

For each of the topics, each PP country provided a brief summary of the current state of norms and incentives in the country and an indication of whether all existing documents are actually included in the survey.

Depending on the specifics discussed, it was necessary to enter **additional information** for the inserted documents among some topics. The latter are described below:

- **Seismic norms**

Determination of the sub-topic(s) of the inserted norm/incentive: design of new structures, assessment of existing structures and retrofitting structures

- **Seismic incentive frameworks**

For each of the documents among this topic, it was determined whether it represents a direct incentive of a financial and economic nature or a kind of indirect incentive. The latter is defined as a document / tool on the basis of which awareness is raised in the field of reducing seismic vulnerability, but it is not a direct financial or economic incentive.

In addition, each PP country should insert a general situation over this topic, i.e., to answer to the following questions: Has your country introduced / intends to introduce seismic certificates (similar to energy performance certificate) for buildings? Do you have Earthquake funds?

- **Post-earthquake planning**

The inserted regulations/incentives should be listed among one of the following subsections:

- general legislation documents relating to civil protection,
- organization of earthquake response/rescue,
- training programs for the earthquake (earthquake emergency search and rescue, professional firefighters, command-and-control, members of civil protection),
- planning (national/local protection and rescue plans, earthquake hazard assessments, earthquake risk assessments, earthquake risk management capability assessments...),
- tools (computer applications...),
- action plans (e.g., earthquake exercise plans)
- other.

- **Insurance against earthquake:**

The chapter is divided into two subchapters, namely: Optional earthquake insurance and General legislation relating to earthquake insurance.

For the documents among the topic of **general legislation**, it is envisaged to complete a table with the general information presented above.

When studying the situation in the field of **optional earthquake insurance**, an additional questionnaire has been prepared. The latter was intended to be filled out by insurance companies that offer the type of insurance in question in each PP country.

There were also some additional questions regarding optional earthquake insurance for each PP country concerned:

- What proportion of the insured buildings in your country is also insured against earthquake?
- As earthquake insurance (premium) depends on the location of the insured building, please, provide information on the division of seismic zones of your country in reference to optional earthquake insurance. What is the basis for this division (is the division determined by insurance/reinsurance companies)? Is the division into seismic zones related to the map of earthquake hazard?

In order to gain insight into the data collection methodology, a blank 2nd stage survey is shown by chapters (topics) in the Annex 1.

4. Collected norms and incentives

4.1 Summary of the collected norms and incentives

The chapter summarizes the first results of collecting existing norms and incentives in all PP countries. The table below shows the number of documents each PP country has collected for each topic and in total.

PP country /Topic	Seismic norms	Building regulations	Urban planning regulations	Seismic incentive frameworks	Post-earthquake planning	Total
Italy	9	3	1	6	5	24
Croatia	3	1	1	/	6	11
Albania	2	1	2	/	2	7
Serbia	4	2	3	/	4	13
Slovenia	1	1	2	1	7	12
Greece	5	3	2	3	8	21
Total	24	11	11	10	32	88

Table 1 - Collected norms and incentives.

The following is a summary of the situation in the project consortium among each of the topics.

Seismic norms

European Eurocode standards are currently in force in all partner countries even if in Italy the reference legislation is a national document that can be considered fully compatible and interchangeable with the application of the Eurocodes completed by the National Appendices. Based on the collected norms, in the past, the countries of the former Yugoslavia as well as Albania had common seismic legislation documents. In Italy and Greece, there are still many remaining regulations in force today, which regulate the broader field of seismic legislation and are related to urban planning and post-earthquake planning. All PP countries have listed seismic norms that are in force at national level, while Italy has also some regulations on regional level. Also, Italy and Greece have some regulatory documents that specifically deal with cultural heritage.

Building regulations

All the six countries involved in the survey have listed building regulations in force at national level. All of PP countries have one document that represents “national building law”. Only in Italy, alongside the national legislation, it is possible to find building regulations enacted at a local scale, namely the municipal level. This is due to the fact that in Italy the urban planning subject is a specific competence of Regions and, in particular,

urban planning tools include building codes and regulation that are enacted by each municipality. Despite this, building regulations in force at local level must be compliant with the national law. To the aim of this investigation, the city of Bologna has been considered only, being the city where the Italian pilot case (WPT2) has been identified.

Urban planning regulations

When it comes to the methodology adopted within the exploitation of this topic, all the laws enacted at National level concerning spatial planning and affecting seismic vulnerability have been inserted for the six countries involved in the project. Whereas urban planning is a subject legislated at regional level (e.g. Italy), only instruments in force in those ones directly involved in the project have been considered in the survey; in addition, if Municipalities have the responsibility of drafting the urban planning tools, these have been narrowed down according the capital city of the Region (e.g. Bologna Municipality in Emilia-Romagna Region for Italy) or the ones directly involved in ADRISEISMIC project (e.g. Municipality of Gjirokaster).

In the field of urban planning regulations, it has been found that some documents do not specifically deal with the reduction of seismic vulnerability at present. However, they have been included in this collection in order to create a common knowledge framework of the tools currently in use in the different countries, to inform further project activities on the improvements that can be suggested to the existing tools, in order to achieve the project goals.

Seismic incentive frameworks

Within ADRISEISMIC area, the most important incentives carried out to tackle seismic vulnerability are economic and financial initiatives that local governments have adopted to encourage the improvement of the quality of the built environment in order to cope with earthquakes phenomena and to prevent enormous losses of human lives and the loss of cultural and economic values. Economic incentives often consist in tax credit and VAT reduction for a certain percentage of the cost of seismic retrofitting interventions (e.g., »Sismabonus« in Italy) with the possibility to transfer the credit to third parties.

While Italy has already in force some financial, economic and volumetric incentives, there are some indirect incentives, which help in raising awareness of the seismic vulnerability of built environment in Greece and Slovenia.

Post-earthquake planning

In all the PP countries, there is in force regulation at national, regional and/or municipal level that represents action plan in case earthquake/natural disasters happen. Some of the laws refer to reconstruction of specific territory after an earthquake. For example, in Croatia, there are many documents in production or already published after the Zagreb earthquake in March 2020. Most of the regulatory documents among the topic of post -earthquake planning refers to the civil protection.

Insurance against earthquake

Insurance against earthquake is not obligatory in any of the PP countries, but an optional insurance against earthquake is available in all PP countries. Countries provided slightly different data on the conditions and characteristics of voluntary earthquake insurance. Some countries have acquired an average share of earthquake-protected buildings, which, however, varies considerably between countries.

4.2 Collected data by country

The following subchapters contain summaries of all the topics covered, separately for each PP country in an alphabetic order. The titles of all collected documents among each topic are given.

All the documents collected are already related to the reduction of seismic vulnerability of the built environment. Exceptions are some documents introduced in the field of urban planning regulations, which represent the basis that would need to be upgraded for the purpose of achieving the project goal.

The last version of 2nd stage surveys, which represent the basis for further activities within WPT1 are available in the annexes.

4.2.1. Albania

SEISMIC NORMS
<p>Summary</p> <p>The technical design condition published in 1989, was the last legally approved update of Albanian technical design codes, which was accompanied by the relevant seismic map. Seismic zoning map, accompanied by the maximum expected MSK-64 intensities of the ground with average conditions for the return period 100 years (possibility of over 30 percent), divides the country into three MSK-64 intensity zones (VI, VII and VIII). Intensity IX is a spot-type phenomenon, located only in the epicenter areas of major historical earthquakes.</p> <p>The differences between the spectrum of KTP-N.2-89 and that of EN 1998-1 for hard soils are smaller than in the case of weaker soils, however the deficiency of our technical conditions remains very large.</p> <p>In this way three periods of anti-seismic projections in Albania could be distinguished:</p> <ul style="list-style-type: none"> - Before 1963 when antiseismic requirements were very low or absent at all - Period from 1963 to 1990 with low seismic requirements - Period after 1990 where seismic requirements are based on KTP-N.2-1989, which based on what we said above, despite being more developed than the previous codes, again they can be considered insufficient for the level of risk seismic in our country. <p>For this reason, individual and institutionalized efforts have been made and continue to be made to update our technical conditions with the Structural Eurocodes.</p>
<p>Collected norms and incentives</p> <ul style="list-style-type: none"> ▪ KTP-N2-89 ▪ Eurocode 8
BUILDING REGULATIONS
<p>Summary</p> <p>A series of approved documents provide general guidance on how specific aspects of building design and</p>

construction can comply with the Building Regulations.

In 2017, the Ministry of Territorial Development compiled and approved a series of documents to define the design standards of various buildings (e.g., for nurseries, schools, kindergartens and apartments)

These rules are mandatory to be followed in the design of any new building or even in interventions that can be made in existing buildings.

Also, these incentives are mandatory to be used throughout the country when designing such objects.

Collected norms and incentives

- Design standards for nurseries, schools, kindergartens and apartments

URBAN PLANNING REGULATIONS

Summary

The law "For Territorial Planning and Development" was adopted in 2014 and year after year has undergone changes.

Also, after the last earthquake with magnitude 6.4, changes were made regarding the shortening of procedures for obtaining a building permit in emergency situations.

These incentives are mandatory to be used throughout the country.

General Local plan of the Gjirokastra Municipality is a strategic planning tool with social, economic, and ecological extensions aimed at integrating people and economic activities successfully into the environment, taking into account the balanced and sustainable development of the region.

Collected norms and incentives

- Law No. 107 dated 31.07.2014 "For Territorial Planning and Development"
- General local plan of the Gjirokastra Municipality

SEISMIC INCENTIVE FRAMEWORKS

Summary

In Albania, there are no existing incentives that could be listed among seismic incentive frameworks.

Collected norms and incentives

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POST-EARTHQUAKE PLANNING

Summary

In Albania, law dealing with reduction of the risk of disasters and the realization of civil protection to guarantee the protection of human life, living things, property, cultural heritage and the environment, through the strengthening of the civil protection system is in force. The law regulates the functioning of the civil protection

<p>system, defining the responsibilities of the institutions and structures of this system, international cooperation, the rights and obligations of citizens and private entities, education, training and inspection.</p>
<p>Collected norms and incentives</p> <ul style="list-style-type: none"> ▪ Law No. 45/2019 “For civil protection” ▪ National Planning of Civil Protection
<p>INSURANCE AGAINST EARTHQUAKE</p>
<p>Summary</p> <p>Real estate insurance against earthquakes in Albania is not legally binding. Albania submitted three questionnaire replies. Answers were provided by SIGAL, ALBSIG and INTERSIG.</p>
<p>Collected norms and incentives</p> <p>/</p>

Table 2 - Albanian summary of the collected documents

4.2.2. Croatia

<p>SEISMIC NORMS</p>
<p>Summary</p> <p>Up until 1964, buildings in Croatia were constructed with no consideration for seismic shaking – and about one-third of the existing building stock dates from this period. In 1964, first seismic codes were introduced, in 2007 ENV norms were very well used and after 2013 (2014 for ongoing projects) structural Eurocodes are mandatory. Eurocode 8, or HRN EN 1998, must be used for the design of earthquake-resistant structures. Several nationally determined parameters (NDPs) are added to the main document. Other documents are not in use.</p> <p>After the earthquake in Zagreb (22nd March 2020), several documents regarding the seismic safety and vulnerability are in production or are already published. Also, several initiatives to reduce seismic vulnerability of existing structures are funded by Croatian Science Foundation as a national research projects. There is also a lot of scientific research regarding the topic at almost every Faculty of Civil Engineering in Croatia (Zagreb, Split, Rijeka, Osijek).</p>
<p>Collected norms and incentives</p> <ul style="list-style-type: none"> ▪ Eurocode 8 ▪ Manual for earthquake restoration of existing masonry buildings ▪ Techniques of repair and reinforcement of masonry buildings
<p>BUILDING REGULATIONS</p>
<p>Summary</p>

In Croatia, there is only one valid document regarding the building regulations. It is called “Construction Act” and it is valid on the national level. Although, there are some different local guidelines for specific types of building regulations, for seismic building regulations there are the same for a whole country.

Collected norms and incentives

- The Construction Act

URBAN PLANNING REGULATIONS

Summary

In Croatia “Zakon o prostornom uređenju” (The law on spatial planning) is a valid document for urban planning regulations.

Collected norms and incentives

- The law on spatial planning

SEISMIC INCENTIVE FRAMEWORKS

Summary

In Croatia, there are no existing incentives that could be listed among seismic incentive frameworks.

Collected norms and incentives

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POST-EARTHQUAKE PLANNING

Summary

After the earthquake in Zagreb (22nd March 2020), several documents regarding the seismic safety and vulnerability are in production or are already published. Also, several initiatives to reduce seismic vulnerability of existing structures are funded by Croatian Science Foundation as a national research projects. There is also a lot of scientific research regarding the topic at almost every Faculty of Civil Engineering in Croatia (Zagreb, Split, Rijeka, Osijek).

Collected norms and incentives

- Emergency seismic reconstruction program
- Plan for the development of the civil protection system in the area of the City of Kaštela
- Protection and rescue plan for the territory of the Republic of Croatia
- Civil Protection System Act
- Law on reconstruction of earthquake buildings in the area of the City Of Zagreb, Krapina-Zagorje Counties and Zagreb Counties
- The Manual for Emergency Seismic Reconstruction Program

INSURANCE AGAINST EARTHQUAKE

Summary

Real estate insurance against earthquakes in Croatia is not legally binding. Croatia submitted one questionnaire reply. The answers were provided by the insurance company Merkur.

Collected norms and incentives

- The Insurance law

Table 3 - Croatian summary of the collected documents

4.2.3. Greece

SEISMIC NORMS

Summary

A clearly common component between Greek and European antiseismic regulations is that the performance requirements and compliance criteria must be fulfilled for the following 3 states: no collapse, damage limitation and life protection.

This defines a customized implementation framework, with intervention measures depending on the flexibility of the construction.

The main problem is the lack of design and constructional info (the so called “as built” info). A significant fact that governs all the antiseismic protection activities, is that: most historical buildings are unreinforced, they usually have no connecting material, shallow foundation, and no special design for transferring the seismic loads to the ground (avoiding deformations). Thus, most of them have gone through several seismic episodes, exceeding their ultimate limit state, standing nowadays on their residual loads.

There are Microzonal Studies, designed for several regions in Greece, sometimes more detailed, for specific regions with high seismic vulnerability. These considerations have the advantage of taking into account the special conditions of each region (spatial, urban, geological background). The capital cities of Heraklion, Rethymnon, Chania, Ag. Nikolaos in Crete, have such microzonal studies, contributing to a more detailed design. However, they are not always obligatory, but only indicative. They are not strictly attached to the official Greek Regulations’ System, but depend on the local authorities to apply them, helping to avoid possible design failures, deriving from generalization.

Collected norms and incentives

- EAK 2000 (Greek Antiseismic Regulations)
- KANEPE 2017 (Intervention National Regulations)
- EUROCODE (6.1, 6.2, 6.3, 7.1, 7.2, 8.1, 8.3, 8.6)
- "Approval of Eurocode use and appliance, in combination with National annexes - ΦΕΚ 1457 Β’ – 5/6/2014"
- Guidelines for assessment and structural interventions on masonry buildings

BUILDING REGULATIONS

Summary

Greek and European building regulations referring to historical monuments, usually deal either with concrete elements or unreinforced masonry, encountering the behaviour factor q , in 3 stages of damage: slight, heavy, collapse.

In these old aged buildings, due to lack of existing structure construction data, a set of “in absentia” values (from empirical knowledge) is used.

After having registered the caused damages and time wear impact in an adequate level of data integrity, a stability control is carried out, setting a degree of intervention measures, after the definition of a new safety factor. The final purpose is to eliminate the seismic vulnerability of the whole structure, inducing the partial plasticity parameters.

Assumptions made, governing all the antiseismic regulations when it comes to deformation tolerance:

- Discrimination of structural elements in 2 main categories: main (foundation bearing vertical loads in a seismic episode) & secondary (masonry, beams, chimneys, etc.).
- Total coherence must be obtained, between the historical structure and the materials we are allowed to use (mortar, fibers, resins).
- When located in a high vulnerability region, any interventions in the historical building must take into account the detailed data given in the micro seismic perspective, if available. If not, then some information for the footing may be derived from geotechnical investigation through boreholes or pits (always with a condition of minimum disturbance).

Collected norms and incentives

- Decision No 3046/304/30.1/3.2.1989 ΦΕΚ 59//1989) - (Greek) Building Regulation
- Decision No 3328 ΦΕΚ 1561B/2-6-2016 Reinforced Concrete Regulation
- Decision No 92330 GGG 1416/B/17-07-2008 and GGG 2113/B/13-10-2008 - Steel Regulation

URBAN PLANNING REGULATIONS

Summary

Spatial planning in Greece is set in four levels:

- General Spatial Planning
- Special Spatial Planning for certain areas of interest
- Regional Spatial Planning (on Regional Level)
- Local Spatial Planning (on Municipality Level)

All the above comprise of many Laws and norms which generate a rather complicated situation as to the Law applied on a certain situation.

Collected norms and incentives

- Decision No 42284/13.10.2017 “ Revised Regional Spatial Framework”
- General Urban Plans (N. 2508/1997, N.1337/1983)

SEISMIC INCENTIVE FRAMEWORKS

Summary

Seismic incentive frameworks in Greece, meaning rules, laws or frameworks that facilitate pre-earthquake, prevention measures as well as actions/plans in case of earthquakes are frameworks that in Greece are not obligatory to apply. They mostly refer to public use buildings and their application is done on a “voluntary” basis even in the public sector. In the private sector, the application of pre-earthquake monitoring is also on a voluntary basis, taking also into consideration the cost of hiring a civil engineer to perform the monitoring.

Collected norms and incentives

- Framework for pre-earthquake monitoring of public utility buildings
- Pre-seismic monitoring of schools LAW.3027/28.06.2002
 - Law 3852/2010 article section 25 94 paragraph 4 connected with Law 1894/1990 article 5 paragraph 12

POST-EARTHQUAKE PLANNING

Summary

Post-earthquake planning in Greece comprises of many documents of various forms and priority. Most of them describe the whole range of earthquake planning, from the preparation stage, to the emergency response and to short term rehabilitation. The above-mentioned legal documents refer to and are all applicable to all stages of administration (from central government, ministries and other governmental organizations, to local administration). It is also usual that certain legal documents are issued to facilitate response and rehabilitation after certain disastrous earthquake incidents.

Collected norms and incentives

- General Civil Protection Plan code name “Xenokratis” (Ministry Decision 1299/2003)
- Law 4662/2020 “National Disaster Management Mechanism, reformation of General Secretary of Civil Protection, CP voluntary system and reform of the Fire Unit”
- General Civil Protection Plan concerning earthquakes 1st edition, code name Engelados
- Law 3013/2002 “Upgrade of Civil Protection”
- Guidelines for planning and execution of civil protection drills (2nd edition)
- Law 1283 FEK114A/19-9-1982: Provisions for lending to citizens affected by earthquake incidents
- Law 867 FEK24A/7-2-1978: Additional Provisions for lending to citizens affected by earthquake incidents in northern Greece
- LAW 1190 ΦΕΚ Α' 203/30.7.1981

INSURANCE AGAINST EARTHQUAKE

Summary

Property insurance against earthquakes in Greece is not legally binding. Greece provided general answers to the survey questions. Answers were given separately for insurance companies in Athens and insurance companies in Crete.

Collected norms and incentives

- Law 867-1979

Table 4 - Greek summary of the collected documents

4.2.4. Italy

SEISMIC NORMS

Summary

In Italy many seismic norms are in force. At national level, NTC 2018 is the most important one together with its explanatory circular. Practitioners who want to project seismic relevant works must respect the provisions included in these norms. With National Appendices to NTC2018 - to be published yet – also Eurocodes can be applied.

When it comes specifically to cultural heritage, another important document is DPCM 09/02/2011 because it focuses on the evaluation and reduction of seismic risk of cultural heritage, giving further explanation, methods and intervention techniques for this type of buildings.

At a national level there is also a seismic classification of national territory which is divided into four zones. This classification is important for urban planning management and to control the seismic risk's evolution of the territory, but it is not used anymore for design purposes (it has been replaced in NTC by other methods).

At a regional level, seismic classification of municipalities has been received and also regional laws have been approved in order to manage the construction process, the qualifications required and the procedures to submit a project to public administrations.

Different considerations can be drafted for what concerns post-earthquakes norms. These are specific documents concerning the reconstruction phase in those regions affected by a specific catastrophic earthquake and they manage the hole recovery process of a building establishing also methods to access to State funding; buildings damaged or destroyed by earthquakes can be repaired with economic incentives supplied by Italian State. At this moment, in Italy the recovery phase is still ongoing in Abruzzo (after L'Aquila earthquake occurred in 2009), in Emilia-Romagna (after Finale Emilia earthquake occurred in 2012) and in Marche (after seismic swarm occurred in 2016 in Norcia, Visso and Accumoli).

Collected norms and incentives

- NTC 2018 – Technical frameworks for construction
- CIRCOLARE ALLE NTC 2018 – Explanatory Circular for NTC 2018 correct application

- DPCM (Directive of President of Council Minister) 9/02/2011 - Evaluation and reduction of seismic risk of cultural heritage in according to NTC 2008
- L.R. (Regional Law) n.19/2008 and following changes - Norms for the reduction of seismic risk
- D.G.R. (Decree of Regional Council) n. 2272/2016 - Document identifying the interventions of no relevance for the public safety for seismic purposes and in-progress variations, concerning structural parts, which are not of a substantial nature"
- L.R. (Regional Law) n. 16/2012 - Norms for reconstruction in areas affected by the earthquake of 20 and 29 May 2012.
- D.Lgs (Legislative Decree) n.189/2016 and subsequent modifications and additions addressing the reconstruction process in areas affected by earthquake starting from August 2016 in Marche region
- OPCM (Ordinance of the President of the Council of Ministers) n. 3274/2003 and subsequent modifications and additions- general criteria for seismic classification of national territory
- DGR (Decree of Regional Council) n. 1164/2018 - seismic classification of municipalities in Emilia-Romagna

BUILDING REGULATIONS

Summary

DPR 380/2001 is the reference document for practitioners in the construction sector and it is valid in the whole national territory.

Therefore, in Italy each municipality has its own specific urban planning tools and for this reason there are as many building regulations as the number of municipalities. These building regulations are all in accordance with DPR 380/2001 so their provisions comply with it.

Collected norms and incentives

- D.P.R. (Decree of President of Republic) n. 380/2001 and subsequent modifications and additions – national building law
- RUE – urban planning regulations for the Municipality of Bologna in force till December 2020
- RE – new urban planning regulation for the Municipality of Bologna in force since December 2020
-

URBAN PLANNING REGULATIONS

Summary

Art. 117 of the Italian Constitution states that urban planning is a subject where Regions are competent together with Italian State. From the 70's the State level has delegated planning law and regulations to the Regions.

In Emilia-Romagna LR 24/2017 is the regional law that establishes the spatial planning discipline in accordance with the fundamental principles of State legislation and the European legal system.

In art.2 the regional law states that the territory government is exercised by municipalities and their unions, by the Metropolitan City of Bologna, by large-area subjects and by the Region.

The local level (i.e., municipalities or their union) is responsible for the design of the urban planning tools identified in accordance with the prescription of the regional law.

Collected norms and incentives

- L.R. (Regional Law) n. 24/2017

SEISMIC INCENTIVE FRAMEWORKS

Summary

In Italy is in force at national level the D.L. n. 63/2013 that gives access to economic incentives to be used for the reduction of seismic risk in buildings and it is applicable, at this moment, for those interventions that improve the seismic safety of constructions. To date, to have access to these economic incentives the interventions must be concluded and paid within May 2022, but this temporal limit is still subject to modifications. This initiative has been called “Sisma Bonus” and in its first version it established that up to 85% of the costs of interventions for seismic vulnerability reduction would have been reimbursed by the Italian state in five years in the form of taxes reduction. The exact amount depends on the kind of interventions implemented and the consequent level of seismic safety obtained. With the D.L. 34/2020 this amount of discount has been raised to 110%. The possibility to transfer the credit to third parties increase the effectiveness of this incentive because also people without the amount of money to pay immediately the intervention can take advantage of the initiative.

Emilia-Romagna Region with the adoption of the new PUG (see table 4.1 in the Annex 5) has also introduced some volumetric incentives to foster the qualification of the built environment from both seismic and energetic point of view. For what concerns the incentives foreseen in the field of seismic retrofitting, the PUG of the Municipality of Bologna allows to increase the volume of the building in the measure of maximum 10 % of total. To access to this volumetric incentive, RE (see table 3.2 in the Annex 5) states the level of seismic safety to reach, according to the type of interventions.

When it comes to indirect incentives, some initiatives are promoted by the Civil Protection department and aim at increasing awareness among citizens and students and sensitising private owners towards the seismic vulnerability of the built heritage.

Collected norms and incentives

- D.L. (Legislative Decree) n. 63/2013 and subsequent modifications made by D.L. n. 34/2020
- D.M. (Minister Decree) n. 58/2017 and subsequent modifications and additions
- LR 24/2017 introduced Volumetric incentives for seismic retrofitting interventions
- “IO NON RISCHIO” – “I don’t take risks”
- “EDURISK”
- "SICURO+"

POST-EARTHQUAKE PLANNING

Summary

The Civil Protection Plan is the principal instrument in force at local level to address disaster risk management. As for urban planning tools, each municipality should have its own Civil Protection Plan. In the Civil Protection website it is possible to see the list and the percentage of municipalities that have already adopted this plan. Here the link: <http://www.protezionecivile.gov.it/servizio-nazionale/attivita/prevenzione/piano-emergenza/mappa-piani-comunali/dati-dettaglio>

The CLE and MS analysis are important instruments and studies to increase the resilience of municipalities through a deep knowledge of soils and urban territories, in case of catastrophic events occur.

Collected norms and incentives

- National plan for the prevention of seismic risk L. 77/2009 – art. 11
- National seismic risk rescue program DPCM 14/01/2014
- Annex II of National emergency plan in the framework of the National seismic risk rescue program
- Municipal Civil Protection Plan
- Analysis of the Emergency Limit Condition (CLE) and Seismic Microzonation (MS)

INSURANCE AGAINST EARTHQUAKE

Summary

In Italy, insurance against earthquake is not legally binding. It is estimated that 836,000 houses are insured against natural disasters which means a percentage of 2.4% on built heritage. This percentage drops to 1.7% if only earthquakes are considered which means that about 570.000 units are insured against earthquakes. The 85% of these latter is located in areas with a lower seismic risk.

Given the large number of insurance companies in Italy, general answers to the survey questions regarding supplementary insurance against earthquake were prepared.

Table 5 - Italian summary of the collected documents

4.2.5. Serbia

SEISMIC NORMS

Summary

The former Yugoslavia (SFRY), including Serbia as one of the republics, had a unified system of regulations for seismic design and construction. The first normative document, mandatory for the whole territory of SFRY, was the 1964 seismic code. Subsequently, an updated seismic code, issued in 1981 (Table 2.3 in the Annex 6), contained updates to the seismic zonation map and the seismic force calculation approach. The Eurocode 8 recently became a mandatory standard for seismic design in Serbia.

Collected norms and incentives

- Projektovanje seizmički otpornih konstrukcija (SRPS EN 1998) (Eng: Eurocode 8: Design of structures for earthquake resistance (EN 1998))
- Pravilnik o tehničkim normativima za izgradnju objekata visokogradnje u seizmičkim područjima (Eng: Technical Regulations for the Design and Construction of Buildings in Seismic Regions)
- Pravilnik o privremenim tehničkim propisima za građenje u seizmičkim područjima (Eng: Provisional Technical Regulations for Construction in Seismic Regions)
- Pravilnik o tehničkim normativima za sanaciju, ojačanje i rekonstrukciju objekata visokogradnje oštećenih zemljotresom i za rekonstrukciju i revitalizaciju objekata visokogradnje (Eng: Technical Regulations for Repair, Strengthening and Reconstruction of Building Construction Damaged by Earthquakes and for Reconstruction and Rehabilitation of Building Structures)

BUILDING REGULATIONS

Summary

The 2009 'Planning and Building Act' is the current governing Act in Serbia. The Eurocode standards were officially introduced and enforced in Serbia through the 2019 'Regulations for Building Structures'. This document was compiled pursuant to the 2009 'Planning and Building Act'.

Collected norms and incentives

- Zakon o planiranju i izgradnji (Eng: Planning and Building Act (Law on Planning and Construction in Serbia))
- Pravilnik za građevinske konstrukcije (Eng: Technical Regulations for Building Structures)

URBAN PLANNING REGULATIONS

Summary

Urban planning in Serbia is officially regulated by the 'Planning and Building Act', which provides general guidelines with respect to planning documents and rules for urban (and spatial) planning. More specific regulations regarding the method and procedure for compilation of spatial and urban planning documents are dictated by the document 'Regulations on the content, methods and procedures for compilation of spatial and urban planning documents'. This document was published pursuant to the 'Planning and Building Act'. The Government of the Republic of Serbia has recently issued the document on 'Sustainable

urban development Strategy of the Republic of Serbia until the year 2030'. The strategy should help identify and resolve key urban development problems in Serbia and support sustainable economic, social and urban development. The document also examines the strategic plans for protection of cultural heritage in Serbia. None of the documents regulating urban planning in Serbia address the subject of seismic vulnerability.

Collected norms and incentives

- Zakon o planiranju i izgradnji (Eng: Planning and Building Act (Law on Planning and Construction in Serbia))
- Pravilnik o sadržini, načinu i postupku izrade dokumenata prostornog i urbanističkog planiranja (Eng: Regulations on the content, methods and procedures for compilation of spatial and urban planning documents)
- Strategija održivog urbanog razvoja Republike Srbije do 2030 Godine (Eng: Sustainable urban development Strategy of the Republic of Serbia until 2030)

SEISMIC INCENTIVE FRAMEWORKS

Summary

With the exception of the two documents listed among post-earthquake topic, which include some general guidelines and recommendations with respect to prevention measures, no other seismic incentive frameworks (nor economic incentives and seismic funds) are currently in place in Serbia.

Collected norms and incentives

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POST-EARTHQUAKE PLANNING

Summary

The 'Catastrophe Risk Assessment in the Republic of Serbia' is a mandatory document, compiled based on the 'Law on Disaster Risk Reduction and Emergency Management'. This document comprises information on the current level of seismic risk in Serbia, including information on seismic hazard, exposure, and vulnerability. The Law on Reconstruction Following Natural and Other Hazards further defines post-earthquake activities.

The Action Plan for the Implementation of the National Disaster Risk Management Programme is adopted by the Government. It does not have the character of law, rather it represents the documentation based on which the Government makes money investment decisions and regulates the organization of institutions in regard to disaster control and reduction. Every year a report is to be adopted, and the Action plan that currently exists refers to the period from 2017 to 2020.

Collected norms and incentives

- Zakon o obnovi nakon elementarne i druge nepogode (Eng: Law on Reconstruction Following Natural and Other Disasters))
- Zakon o smanjenju rizika od katastrofa i upravljanja vanrednim situacijama (Eng: The Law on Disaster

Risk Reduction and Emergency Management)

- Procena rizika od katastrofa u Republici Srbiji (Eng: Catastrophe Risk Assessment in the Republic of Serbia)
- Akcioni plan za sprovođenje Nacionalnog programa upravljanja rizikom od elementarnih nepogoda (Eng: Action Plan for the Implementation of the National Disaster Risk Management Programme)

INSURANCE AGAINST EARTHQUAKE

Summary

Real estate insurance against earthquakes in Serbia is not legally binding. Serbia submitted three questionnaire replies. Answers were provided by UNIQUA, DOOR and Generali.

Collected norms and incentives

- Zakon o osiguranju (Eng: Insurance Law)

Table 6 - Serbian summary of the collected documents

4.2.6. Slovenia

SEISMIC NORMS

Summary

The first seismic regulations for the territory of Slovenia were issued after the earthquake in Skopje, in 1963. This was followed by the Yugoslav legislation in 1964 (Pravilnik o privremenim tehničkim propisima za građenje u seizmičkim područjima, 1964). At the beginning of the 1980s, after the Montenegrin earthquake (1979), a new Regulation (Pravilnik o tehničkim normativima za izgradnju objekata visokogradnje u seizmičkim područjima, 1981) entered into force. Today, the design and construction of structures are regulated by European standards - Eurocodes, which came into force in Slovenia in 2005. In seismically active areas, the requirements of Eurocode 8-1 apply: Design of structures for earthquake resistance: General rules, seismic load and rules for buildings (SIST EN 1998-1: 2005). Design according to Eurocode 8 is based on the fact that the structure must be designed and constructed in such a way that it will withstand the design earthquake without being partially or completely destroyed.

In the analysis of existing masonry buildings, Italian standard NTC 2008 is occasionally used.

Collected norms and incentives

- Eurocode 8: EN 1998-1 (2004)

BUILDING REGULATIONS

Summary

In Slovenia, there is only one existing document regarding the building regulations. It is called “Building Law” and is valid at the national level. The seismic issue is addressed in the document in Act 16, which deals with mechanical resistance and stability of structures.

<p>Collected norms and incentives</p> <ul style="list-style-type: none"> ▪ Gradbeni zakon (Eng. Building Law)
<p>URBAN PLANNING REGULATIONS</p>
<p>Summary</p> <p>In Slovenia, the Spatial Planning Act is in force in the field of urban planning. In this field also the manual Regulatory Elements is currently in force. In the manual, earthquake is mentioned as one of the health, safety, sanitary and technical aspects that define the purpose of determining deviations.</p>
<p>Collected norms and incentives</p> <ul style="list-style-type: none"> ▪ Zakon o urejanju prostora (ZUreP-2) (Eng.: Spatial Planning Act (ZUreP-2)) ▪ Regulacijski elementi (Eng: Regulatory elements)
<p>SEISMIC INCENTIVE FRAMEWORKS</p>
<p>Summary</p> <p>In Slovenia, there are no existing financial or economic incentives for the purpose of reducing seismic vulnerability of built environment. In an indirect sense, an incentive is represented by the POTROG project. Within the latter, an application for damage assessment of buildings, intended for the general public, has been developed.</p>
<p>Collected norms and incentives</p> <ul style="list-style-type: none"> ▪ Aplikacije POTROG (Eng. POTROG applications)
<p>POST-EARTHQUAKE PLANNING</p>
<p>Summary</p> <p>Many documents of various forms and priority exist within the post-earthquake planning in Slovenia. They describe different subtopics: general legislation relating to civil protection, organization of response/rescue and planning. The documents deal with preparation as well as emergency response and also short term rehabilitation on national, regional and local level.</p>
<p>Collected norms and incentives</p> <ul style="list-style-type: none"> ▪ Zakon o varstvu pred naravnimi in drugimi nesrečami (ZVNDN) (Uradni list RS, št. 51/06 – uradno prečiščeno besedilo, 97/10 in 21/18 – ZNOrg) (Eng: Protection Against Natural and Other Disasters Act) ▪ Resolucija o nacionalnem programu varstva pred naravnimi in drugimi nesrečami v letih od 2016 do 2022 (Uradni list RS, št. 75/16) (Eng: Resolution on the National Programme for Protection against Natural and Other Disasters 2016-2022) ▪ Uredba o organiziranju, opremljanju in usposabljanju sil za zaščito, reševanje in pomoč (Eng. Decree on the Organization Equipment and Training of Protection and Aid Forces)

- Uredba o organiziranju, opremljanju in usposabljanju sil za zaščito, reševanje in pomoč
- Državni načrt zaščite in reševanja ob potresu (Eng. National plan for civil protection and disaster relief in case of earthquake)
- Regijski načrt zaščite in reševanja ob potresu na območju ljubljanske regije (Eng. Regional earthquake protection and rescue plan in the Ljubljana region)
- Načrt Mestne občine Ljubljana za zaščito in reševanje ob potresu (Eng. Plan of the City of Ljubljana for earthquake protection and rescue)

INSURANCE AGAINST EARTHQUAKE

Summary

Property insurance against earthquake in Slovenia is not legally binding. Slovenia submitted five completed questionnaires. The answers were provided by all insurance companies that offer earthquake insurance: Triglav, Sava, Generali, Merkur and Grawe.

Collected norms and incentives

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Table 7 - Slovenian summary of the collected documents

5. Conclusions

To achieve the overall objective of the work package, ADRISEISMIC has firstly developed an in-depth study of the existing regulations in the Countries involved regarding the reduction of seismic vulnerability on existing buildings and related forms of financial and economic incentives. A particular attention has been paid at collecting specific regulations and tools addressing the historical parts of the cities, intended as the more fragile but at the same time the richest of cultural heritage.

Deliverable T1.1.1 presents a report on norms and incentives collected within the first activity of the WPT1. The collection of all the existing norms and incentives has been carried out in all participating countries: Italy, Croatia, Albania, Serbia, Slovenia and Greece.

For the purpose of the Activity T1.1 within WPT1, specific topics have been identified in order to cover as best as possible the overall situation related to reduction of seismic vulnerability of built environment in all project partner countries. The topics, defined for the purpose of the survey, are: seismic norms, building regulations, urban planning regulation, seismic incentive frameworks, post-earthquake planning and insurance against earthquakes.

In order to achieve the best possible understanding of the seismic vulnerability regulatory framework across the countries, while incorporating as much existing documentation as possible and obtaining its detailed data, it was decided to collect the data in the form of a survey. The survey has been conducted in two phases. In the first phase, a basic survey has been prepared. After receiving the first results, the evaluation phase started. With the aim of comparability and obtaining as much information as possible about the existing material, the 2nd stage survey has been formed on the basis of the 1st stage survey. The material collected in the latter forms the basis for this deliverable.

Data collection steps, their time frames and the content are briefly presented in the report.

In the first section of the survey, some basic general information on project partner country and its seismic activity was needed. The following is the substantial part of the survey. The 2nd stage survey consists of 6 chapters dedicated to 6 topics that, in our opinion, are the key to reduction of seismic vulnerability of the built environment. For each of the norms/incentives the information on the entry into force of the document, on its target users, on the promoter, on the link to EU regulations, on the link to the reduction of seismic vulnerability, on the link to cultural heritage, etc. has been collected.

In the report, a summary of the first results of collecting existing norms and incentives in all PP countries is presented in general and per each country separately in dependence on the topic among which the documents are listed. A total number of 88 has been collected, highlighting the high level of complexity that characterises the seismic vulnerability at urban scale.

Some general findings on the situation in the main topics covered, are:

- **Seismic norms:** European Eurocode standards are currently in force in all partner countries; Italy and Greece have many remaining regulations which regulate the broader field of seismic legislation; regulation on the national level prevails;

- **Building regulations:** All the six countries involved in the survey have listed building regulations in force at national level. All of PP countries have one document that represents “national building law”. Only in Italy, alongside the national legislation, it is possible to find building regulations enacted at a local scale, namely the municipal level.
- **Urban planning regulations:** When it comes to the methodology adopted within the exploitation of this topic, all the laws enacted at National level concerning spatial planning and affecting seismic vulnerability have been inserted for the six countries involved in the project. Whereas urban planning is a matter of Regions, only instruments in force in those ones interested by the ADRION programme have been considered in the survey;
- **Seismic incentive frameworks:** only Italy has financial and economic incentives, while Greece and Slovenia collected some incentives, which help in raising awareness of the seismic vulnerability of built environment
- **Post-earthquake planning:** in all of the PP countries, there is in force regulation at national, regional and/or municipal level that represents action plan in case earthquake/natural disasters happen. Some of the laws refer to reconstruction of specific territory after an earthquake
- **Insurance against earthquake** is not obligatory in any of the PP countries. Optional insurance against earthquake is available in all PP countries. Countries provided slightly different data on the conditions and characteristics of voluntary earthquake insurance.

All data collected on existing regulations and incentives provided by PP countries within the last version of 2nd stage surveys, which represent the basis for further activities within WPT1, are in the annexes.

To conclude, within the activity T1.1, all PP countries provided available norms and incentives. The latter are expected to differ considerably in both number and content. The collected data represent the first picture of the situation in the considered area. They provide us with rough insights into the order in the field of seismic regulation of individual countries. Examples of good practice and some shortcomings are shown. All in all, it will be a good basis for further activities within WPT1. The first one of the latter is a comparison matrix, presented in detail in Deliverable T1.1.2.

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Annexes

- **Annex 1: Blank 2nd stage survey**

D1_1_1_2021_Annex1_Blank_2nd-stage-survey.pdf

- **Annex 2: 2nd stage survey for Albania**

D1_1_1_2021_Annex2_Albania.pdf

- **Annex 3: 2nd stage survey for Croatia**

D1_1_1_2021_Annex3_Croatia.pdf

- **Annex 4: 2nd stage survey for Greece**

D1_1_1_2021_Annex4_Greece.pdf

- **Annex 5: 2nd stage survey for Italy**

D1_1_1_2021_Annex5_Italy.pdf

- **Annex 6: 2nd stage survey for Serbia**

D1_1_1_2021_Annex6_Serbia.pdf

- **Annex 7: 2nd stage survey for Slovenia**

D1_1_1_2021_Annex7_Slovenia.pdf