

# READINESS

# Pilot Operational Plan Framework

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## Introduction

Pilot Operational Plan Framework (POPF) is the main deliverable of WP3, document that details the project response to the challenges posed in the context of the project, developed on diversities and openness requirements of each territory.

POPF is a document that combines three different topics that have one overall objective which is increasing the safety of Croatian and Italian Adriatic basin from natural and man-made disasters by improving the both countries resilience, namely overall ability of ecosystems and communities to resist, accommodate to and recover from the effects of forest fire and earthquake hazards in timely and efficient manner by:

- Improving the proactive readiness of Civil Protection in facing forest fire and earthquake risk;
- Establishing cross border model and pilot actions to monitor strategic and relevant public buildings;
- Improving citizens behaviour to face forest fire and earthquake disasters.

## POPF Methodology

POPF is a result of many activities that preceded several activities:

### 1. Analysis of capitalizing practices and outcomes

First activity that needed to be implemented was analysis of technical, scientific and practical issues related to the transferability of the deliverables and best practices (of HOLISTIC and PROMPT project) to outline:

1. the essential enhancement and adaption measures to be developed
2. expected outputs to achieve specific objective:
  1. to improve the proactive readiness of Civil Protection in facing forest fire and earthquake hazards;
  2. to establish cross border model and pilot actions to monitor SPB
  3. to improve citizens behaviour to face forest fire and earthquake disasters

In order to achieve the expected outputs of particular activity the following steps were made:

√ Establishment of three thematic task forces (TF)

During Kick off meeting held in Termoli (7-8 February 2018) three Thematic Forces (TF) were established:

1. **TF 1- Civil Protection Advanced Training** composed by LP, PP1, PP2, PP3, PP4, PP5, PP6
2. **TF 2- SPB Seismic monitor**, composed by LP, PP1, PP2, PP3, PP4, PP5, PP6
3. **TF 3- Citizens raise awareness** composed by LP, PP1, PP2, PP3, PP4, PP5, PP6

TF members implemented the following activities:

- Each TF participated in (preliminary) survey of capitalizing items in its thematic area. Elements of survey/capitalizing item were:
  1. Title of CP advanced training/SPB building/awareness event
  2. Type of CP advanced training/SPB building/awareness event
  3. Location and NUTS classification
  4. Description
  5. Description of outputs/results and lesson learned
  6. Relevance to project themes/ objectives/outputs
  7. Proposal for enhancement/adaptation measures

After all participation TF members gave their inputs for survey of capitalizing item, all data were sublimated in technical reports and three TF *Technical Reports* were released 6<sup>th</sup> of April 2018:

- **TF 1 - Civil Protection Advanced Training** consists of data delivered by LP, PP1, PP3, PP4, PP5 and PP6
- **TF 2 - SPB Seismic monitor** consists of data delivered by PP, PP2, PP4 and PP5
- **TF 3- Citizens raise awareness** consists of data delivered by LP, PP1, PP3, PP4, and PP6

## 2. Capitalizing practices' enhancement & adaptation

Second major activity related to further implementation of project activity in preparation of methodologies, procedures and framework to be tested and implemented on involved territories for which Technical Reports were used as a base. Implemented activities in that respect were:

- Workshops- skype meetings per TF:
  - **TF 1** workshop organized 5<sup>th</sup> June 2018
  - **TF 2** workshop organized 28<sup>th</sup> March, 18<sup>th</sup> May 2018
  - **TF 3** workshop organized on 18<sup>th</sup> April 2018

During the Workshops TF members discussed about methods/procedures that will be implemented through pilot projects in order to achieve the project deliverables. After all TF members made analyses based on capitalizing items and taking into consideration their specific needs, they proposed methodologies, procedures and framework to be tested and implemented on involved territories in general which were all sublimed in three *Thematic enhancement and adaptation reports* per each TF.

Thematic enhancement and adaptation reports were used as a base line for development of Pilot deployment methodologies framework that was discussed on TF workshop that was held during Project and SC meeting in Dubrovnik (18-20 June 2018). As a delivery of TF Workshop *Pilot deployment methodologies framework* per each TF were defined and it consisted of the following elements:

- Type of pilot activity
- Geographic area- giving a brief description of involved area and its substance per each theme
- Phases of pilot activity
- Methodology/Phases of pilot activity implementation (Pilot team composition,)
- Enhancement/adoption measures to be implemented
- Expected outputs of pilot activities
- Estimated budget

Pilot Operational Plan Framework for TF 1 was tailored in order to implicate also the *Structure of exercises guidelines* (execution phase of exercises based on exercises carried out in HOLISTIC and PROMPT project).

As a result of all above mentioned activities TF members gave their inputs tailored to specific context, needs and willingness of each involved territory that are integrated in Pilot Operational Plan Framework of Readiness project, which is document that details the project response to the challenges posed in the context of the project and provides a clear picture of how each involved territory needs to implement the pilot activities.

Pilot Operational Plan Framework is structured in three thematic chapters:

- **TF 1 - Civil Protection Advanced Training**
- **TF 2 - SPB Seismic monitor**
- **TF 3- Citizens raise awareness**

**TF-1**  
**Advanced Training Fire Risk and Seismic Risk**

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**LP - MOLISE REGION**

<b>Geographical area</b>
<i>Brief description of involved area and its substance in terms of Fire Risk and Seismic Risks (max 1000 chars)</i>
The pilot action will involve the entire area of the Molise Region, with particular attention to the areas located in the municipalities of Campobasso, Campochiaro, Isernia, Termoli and Trivento. These identified areas are particularly sensitive as regards the presence of a high fire and seismic risks. Only in 2017, about 100 fires have spread in the Molise Region for a total of 1300 hectares of destroyed territory. In addition, in the last few years many seismic events have affected the area, among which the 2002 earthquake was particularly strong. It hit the Italian regions of Molise and Apulia on 31 October at 10:32:58 (UTC). The shock had a moment magnitude of 5.9 and a depth of 10.0 km

(6.2 mi).[1] Most of the victims were killed and injured when a school collapsed in the town of San Giuliano di Puglia: 26 of the 51 schoolchildren died, together with one of their teachers.

Basic info	
Surface	4.438 km <sup>2</sup>
Population	314.725
Municipalities	The Molise Region consists of two provinces: Campobasso and Isernia. In the Region there are 136 municipalities.
Bordering area	Molise is bordered by Abruzzo to the north, Lazio to the west, Campania and Apulia to the south and east. Molise has a small coastline bordering the Adriatic to the northeast.

#### Type of training

##### *Description of training, number of participants and equipment used (max 500 chars)*

The pilot action consist in the organization of a high level training course for categories C and D of the Regional Civil Protection Service and tutoring, aimed at the certification of trainers who will export their knowledge (cultural background) to volunteers, citizens, bodies of the civil protection system on predictable and climatological natural risks and, more specifically, on seismic risk and forest fires. This will be followed by a basic course addressed to volunteers and performed by the categories C and D of the Regional Civil Protection Service previously trained.

Participants: 15 participants (staff of the Civil Protection) and 30 volunteers.

Trainers: University of Molise

Venue of the course: Civil Protection headquarter of Campochiaro and University of Molise

### Phases of pilot training

#### *List of various phases and their brief description (max 2500 chars)*

The advanced training will include three steps:

- 1) Highly specialized frontal training on the theory of natural hazards and more specifically on seismic risk and forest fires, as well as training on communication techniques and institutional communication in emergency. The proposed activity will be developed taking into account both the use of innovative training techniques and multimedia communication technologies, as well as innovative methods for assessing trained personnel. The course will focus on the following arguments:
  - Regulations/laws
    - Code of the Civil Protection
    - Rules on the third sector
  - Climate risk
    - General notions of applied climatology
    - Molise and climate risk
    - Legislation in the field
  - Forest fire risk
    - Legislation in the field
    - General notions on AIB planning and forecast products
    - Molise and the risk of forest fires
  - Seismic risk
    - Legislation in the field
    - General notions on the seismic risk
    - Molise and the seismic risk

- Training and communication techniques
  - Institutional communication to face an emergency
  - Responsibility and Design of Civil Protection exercises
- 2) At the end of the training path addressed to categories C and D of the Regional Civil Protection Service, It is planned to complete a training program for Civil Protection Volunteers (Basic Course), whose teachers will be the categories C and D of the Regional Civil Protection Service previously trained. In this phase, a tutoring activity is required both in the exercise planning activities and during the exercise, supporting the participants in the high-level training path.
- 3) At the end of all the training activities, both of the advanced level and of the basic course for volunteers, the assessment of the formats by the teaching staff will take place.

#### Pilot Team composition

*Brief description of the team composition, detailing requested expertise and background for each member. (max 500 chars)*

- 15 participants (categories C and D of the Regional Civil Protection Service);
- 30 volunteers of the Civil protection.

#### Enhancement/adoption measures to be implemented

*(max 500 chars)*

To enhance the territorial resilience thanks to a more prepared staff to address the prevention and management of forest fire and earthquakes.

#### Expected outputs of pilot intervention

*(max 500 chars)*

15 participants (categories C and D of the Regional Civil Protection Service) trained  
30 volunteers of the Civil protection trained.

#### Estimated budget for pilot training



*(max 500 chars)*

Estimated costs:

- 1) External expertise: 23.900,00 euro
- 2) Equipment: 9.950,00 euro

### PP1 - DUBROVNIK AND NERETVA REGION (DNR)

#### Geographical area

*Brief description of involved area and its substance in terms of Fire Risk and Seismic Risks  
(max 1000 chars)*

The Dubrovnik and Neretva Region is the southernmost region of the Republic of Croatia and it is territorial organized into 22 units of local government and self-government with 5 cities and 17 municipalities. The regional center is the City of Dubrovnik. The Region consists of two basic functional and physiognomic units: a relatively narrow longitudinal coastal area with a string of offshore islands and closer islands and the area of Lower Neretva with its gravitating coastal zone. The Region is divided by the state border line with Bosnia and Herzegovina. The area of the Region has all the characteristics of the Mediterranean climate. According to the official Risk Assessment of the DNR forest fire and earthquake are the highest ones. The DNR has been hit by serious fire in 2015 when a great surface of the Pelješac peninsula burned down causing great damage in agriculture and tourism. The last greater earthquake hit the DNR in 1996.

Basic info	
Surface	9272,2km <sup>2</sup>

Population	122870
Municipalities	5 cities, 17 communities
Bordering area	Italy, Bosnia and Herzegovina, Montenegro

Picture of partner country/region



Figure 1. Republic of Croatia with Dubrovnik and Neretva Region marked in green



Figure 2. Dubrovnik and Neretva Region marked in yellow

#### Type of training

*Description of training, number of participants and equipment used (max 500 chars)*

Training of ten firefighters who will become firefighting officers. After the theoretical part of the training, practical exam and exercise will be organized. 20 firefighters will be educated for the handling with various hydraulic tools necessary for the interventions in case of earthquake and heavy traffic accidents. To all of them certificates will be issued. Combined earthquake and wildfire exercise will be organizing which will gather more than 150 participants, including citizens who will participate in the exercise. In order to improve the levels of the preparedness wildfire exercise will be organized and the proposed time is the beginning of the next year. New equipment for the interventions after the earthquake will be procured and used as already existing one.

#### Phases of pilot training

*List of various phases and their brief description (max 2500 chars)*

The first phase is planning of the exercise/s in the Plan of the Civil Protection Exercises (Law on Civil Protection System, Official Gazette 82/15). Each civil protection exercise demands the obligatory form of the elaborate whose form is prescribed by the Regulation on Types and Methods of the Implementation of the Civil Protection Exercise (Official Gazette 49/16) which basically leads throughout the process of the civil protection exercise organization. The other trainings will consist of two major parts: theoretical and practical one. Theoretical part will be conducted according to the relevant rules after which the practical part and analysis will be performed. In general, the key phases are: planning, implementation and analysis.

#### Pilot Team composition

*Brief description of the team composition, detailing requested expertise and background for each member. (max 500 chars)*

Trainings will be performed by licensed trainers educated for the salvations deform the hardly accessible areas, ruins and wildfires. Requested expertise relates to the experiences previous training courses as well as experiences gathered during different demanding interventions. Since the members of training team are subject to market research and public procurement procedures their detailed background, if necessary, will be provided later on. The leadership team who will, in a certain way, supervise the implementation of the exercises and trainings is the Civil Protection Headquarters which numbers 17 members appointed by the President.



Figure 1. Example of the civil protection force exercise (HOLISTIC, 2016)

#### Enhancement/adoption measures to be implemented

*(max 500 chars)*

Accomplishments occurred during the READINESS project will be incorporated as a substantial part of the existing procedures regarding the interventions of the civil protection members, mainly firefighting forces. Procured equipment will be used for further civil protection exercises which will improve the preparedness of the civil protection system in general.

#### Expected outputs of pilot intervention

*(max 500 chars)*

Well trained and educated civil protection forces members for the demanding interventions from the hardly accessible areas and from destroyed and ruined buildings in case of earthquake, improved chain of command, established sustainable civil protection procedures.

**Estimated budget for pilot training**

*(max 500 chars)*

The costs for the implementation of the proposed activities are subject to market research and public procurement procedures. Here is the estimation:

Equipment: 35000 EUR

External expertise: 20000 EUR

**PP2 - MARCHE REGION (FIRE)**

**Geographical area**

*Brief description of involved area and its substance in terms of forest fire risks*

*(max 1000 chars)*

The 89% of Marche region is hilly or mountain territory. 30% of this territory is covered by forest. Several small villages and towns are close to forest areas and vulnerable to forest fire, especially in summer seasons.

Basic info	
Surface	9.401 km <sup>2</sup>
Population	1,551 million
Municipalities	Marche is divided in five districts: Ancona (administrative center), Fermo; Pesaro e Urbino, Macerata, Ascoli Piceno. Total number of municipalities: 236
Bordering area	To the north the Marche borders with Emilia-Romagna (province of Rimini) and the Republic of San Marino; to the west with Tuscany (province

of Arezzo), Umbria (province of Perugia) and Lazio (province of Rieti); to the south with Abruzzo (province of Teramo) and to the east with the Adriatic Sea.

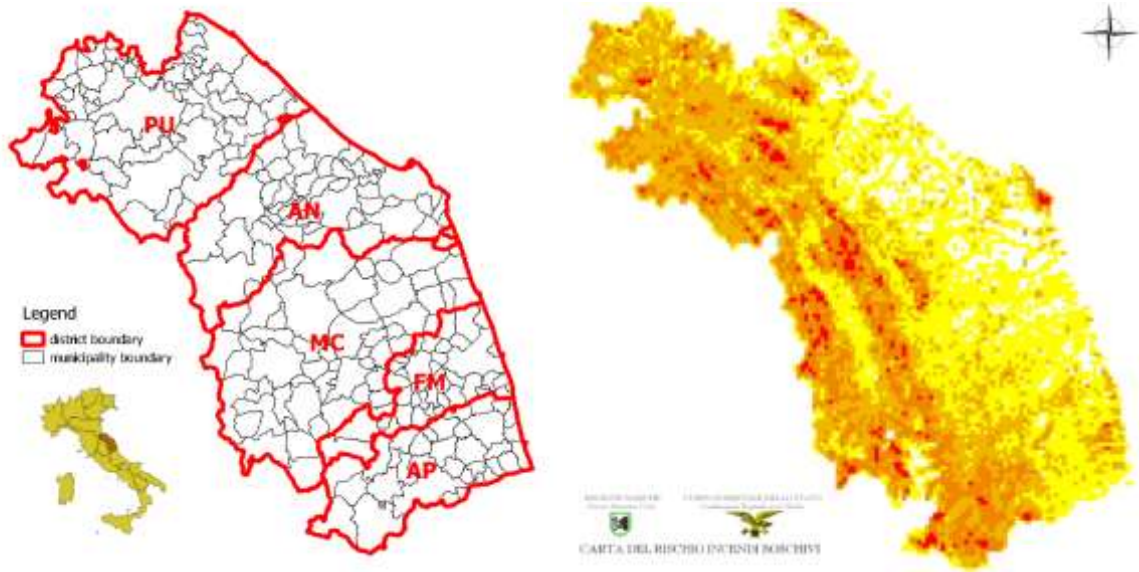


Fig. 1 Marche Region territories and forest fire risk map







Fig. 2 module B - civil protection field simulation in Fabriano, 9th -10th of June 2018.

#### Type of training

*Description of training, number of participants and equipment used (max 500 chars)*

Every summer more than 550 civil protection volunteers collaborated with fire fighting brigades in extinguishing and recovery operation. Moreover a summer campaign of forest fire sighting is set thanks to the collaboration of the local civil protection volunteer groups.

Capitalizing Holistic project past experiences, new courses divided in two main modules are realized.

##### Module A:

3 courses for 30 people (tot. 90) held in Fano, Fabriano and Sant'Elpidio a Mare on 26th and 27th of May - theoretical lessons

##### Module B:

3 field practices and simulations for 30 people (in total the same 90 volunteers that attended module A) held in Fermignano, Fabriano and Venarotta Municipalities on 9th and 10th of June.

90 Civil Protection volunteers trained – fire fighting course certification obtained

##### Equipment:

- Forest fire fighting modules on off-road vehicles

- Personal PPE (Personal Protective Equipment)

#### Kind of buildings

*List of number & types of buildings (max 500 chars)*

Municipalities venues and forest fields

#### Phases of pilot training

*List of the various phases and their brief description (max 2500 chars)*

Module A – theoretical lessons - topics covered:

- Notions of health and safety according to the Italian Legislative Decree 81/2008
- Typology of forest fire
- Type of forest
- Use of equipment for fighting forest fires and PPE (Personal Protective Equipment)
- Typology of blaze
- Methods of field intervention
- Type of accident/injury due to forest fire extinguishing operations

Module B - practice

The fire fighting practices will consist of:

- Initial inspection to identify the types of regional forests
- Simulation of a forest fire intervention of volunteers in extinguishing the fire front, coordinated by Fire brigades – field drill
- On-site inspection of burnt area.

#### Pilot Team composition

*Brief description of the team composition, detailing requested expertise and background for each member. (max 500 chars)*

Tutors: 2 senior Marche Region Civil Protection officer. They are in charge of civil protection volunteers enrollment, training, insurance covering etc.

Teachers/Instructor: Regional local Fire-Fighting brigades, specialized in fire fighting operations, drills and procedures. An agreement of cooperation between Marche Region and Fire Brigade Corps has been signed in order to face regional forest fire.

#### Enhancement / adoption measures to be implemented

*(max 500 chars)*

Improve the preparedness of Civil Protection volunteers in forest fire sighting, extinguishing and recovery operation. Enhance territories resilience.

#### Expected outputs of pilot training

*(max 500 chars)*

90 civil protection volunteers trained for forest fire fighting activities – certified team.

#### Estimated budget for pilot training

*(max 500 chars)*

2.000 euro for Civil Protection Staff

Budget for trainers was already included within the regional agreement with Firefighters Corps.

## PP2 - MARCHE REGION (SEISMIC)

### Geographical area

*Brief description of involved area and its substance in terms of seismic risks  
(max 1000 chars)*

In the Marche Region, the seismicity is characterized by a series of moderate-to-large historical and recent earthquakes. The 2016-2017 Central Italy sequence caused fatalities and damage in an area of 60 km along the Apennine chain. The damaged area is still active at present day. Another recent seismic sequence started in 1997 (the Umbria-Marche sequence).

There are areas characterized by a different level of hazard, but the seismic risk is uniform and medium level. The Apennines have in fact stronger and more frequent earthquakes, but it is sparsely populated (low exposure) and many buildings have been restructured after the earthquakes of 1997 (low vulnerability). The coastal area has less frequent and relatively less severe earthquakes, but is densely inhabited and houses most of the industries. The municipalities have undergone adequate seismic regulations since 1980. Only 20% of buildings have a low level of maintenance.

Basic info	
Surface	9.401 km <sup>2</sup>
Population	1,551 million
Municipalities	Marche is divided in five districts: Ancona (administrative center), Fermo; Pesaro e Urbino, Macerata, Ascoli Piceno. Total number of municipalities: 236
Bordering area	To the north the Marche borders with Emilia-Romagna (province of Rimini) and the Republic of San Marino; to the west with Tuscany (province of Arezzo), Umbria (province of Perugia) and Lazio (province of Rieti); to the south with

Abruzzo (province of Teramo) and to the east with the Adriatic Sea.

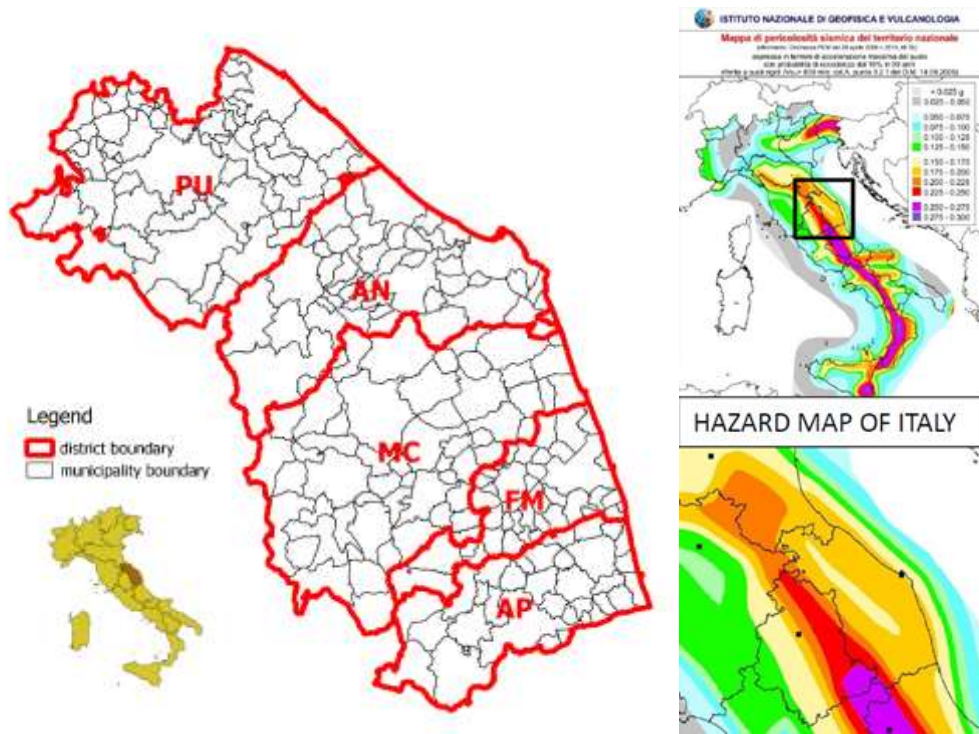


Fig. 1 Marche Region territories and seismic hazard map



Fig. 2 – work caffè with civil protection volunteers leader groups to define course programme

#### Type of training

##### *Description of training, number of participants and equipment used (max 500 chars)*

An experimental training course for operators of one or more municipal volunteers groups of civil protection will be carried out, aimed at specific training on seismic risk and at the codification of a code of conduct in which the volunteer can also assume a new role of local observer in case of earthquake to evaluate damages.

Venue of the course: civil protection volunteer headquarter of Belforte del Chienti municipality

Participants: 30 Civil Protection volunteers

Equipment used: PPE equipment for Civil Protection Volunteers

Trainers: external expertise from Istituto Nazionale di Geofisica e Vulcanologia (INGV) and civil protection officers

#### Kind of buildings

*List of number & types of buildings (max 500 chars)*

Training Course: headquarter of Belforte del Chienti municipality

#### Phases of pilot training

*List of the various phases and their brief description (max 2500 chars)*

The experimental campaign will be carried out in a town in the Marche region adjacent to the epicenter of the recent seismic sequence in 2016. The town is quite small one and it was chosen by the volunteer office of the Civil Protection Service of the Marche region. The involvement of a small number of volunteers will allow a better control of the effectiveness of the experimental campaign that will be organized in the following way:

- a) First meeting with the managers of local volunteer organizations and of the municipal administration for the presentation of the project (a workcafe has been already implemented in Belforte del Chienti on the 19th of April 2018).
- b) Preparation, implementation and evaluation of entry tests for the evaluation of the preparation of the volunteers to the topic (21st of June 2018).
- c) Preparation of course support material and also valid for dissemination to the population on the occasion of various dissemination activities promoted by the Region (info day in November 2018 for students at Marche Politechnic University, Ancona Public event in April 2019) .
- d) Start of the course with lectures on the different themes of seismic risk. During the activity, a visit will be organized - in collaboration with the Civil Protection Service voluntary office - to the seismic data acquisition centre of the Ancona or Rome offices of INGV. Volunteers will be involved in simulations of a seismic event to be localized according to normal procedures and trained on national procedures used by INGV for communications with the National Department and for the dissemination of information in emergency.
- e) Preparation of volunteers for the new role of local observer. An attempt will be made to develop a codified code of conduct that will allow - in a simple but effective way - the transfer to the regional

offices of information on the effects of earthquakes felt in the localities/municipalities of the associations/group of volunteers.

f) Preparation, implementation and evaluation of exit tests.

g) Debriefing with assessment of any critical issues within November 2018.

#### Pilot Team composition

*Brief description of the team composition, detailing requested expertise and background for each member. (max 500 chars)*

- 30 civil protection volunteers
- 4 regional civil protection officers
- 4 INGV teachers

#### Enhancement / adoption measures to be implemented

*(max 500 chars)*

Test the effectiveness of a course for civil protection volunteers focused on seismic risk and to assume a new role of local observer in case of earthquake to evaluate damages. Enhance territories resilience.

#### Expected outputs of pilot training

*(max 500 chars)*

30 trained volunteers of main local groups close to the recent earthquake seismic sequence

Seismic educational materials to disseminate information to civil protection volunteers and population

#### Estimated budget for pilot training

*(max 500 chars)*



Budget for trainers is already included in the external expertise amount indicated in the Pilot operational SPB monitoring

3.000 euro for Civil Protection Staff

### PP3 - SPLIT-DALMATIA COUNTY (SDC)

#### Geographical area

*Brief description of involved area and its substance in terms of seismic & forest fire risks (max 1000 chars)*

The Mediterranean is one of the areas that lie on the border between the Eurasian and African tectonic plates. The African plate falls under the Eurasian slab (subdubic zone), and in these areas, seismic energy is released in the form of weaker and stronger earthquakes.

Split-Dalmatia County is located on one of those “high risk” areas and as such is prone to frequent seismic activities. On average there are hundred of smaller tremors and dozens of stronger earthquakes notable annually, some of which regularly cause extensive damage...

In terms of seismic hazard that is why we choose to direct our efforts to north Dalmatia, mainly between city of Sinj, Imotski and Makarska.

In the area of Split-Dalmatia County throughout the year there is a constant high risk of forest fires, especially during the summer season do to a large income of tourists.

Forest fires in SDC are of great concern because of geological property of the area involved, common drought's and highly flammable vegetation consisting mostly of underbrush and pine trees in coastal area and islands. That is the area we will focus most of our fire hazard prevention efforts.

Basic info	
Surface	14.106,40 km <sup>2</sup>

Population	454.798
Municipalities	16 cities; 39 communities
Bordering area	Bosnia & Hercegovina & Italy (overseas)

Picture of partner country/region



Example of training drill with short description and picture

Info day- West Coast- exercise of civil protection units of County of Split- Dalmatia (400 participants) which consisted of:

- Presentation of all units for civil protection in Split- Dalmatia County
- Exercise of civil protection units- civil evacuation from building, fire fighting at sea
- Project HOLISTIC- Presentation of main project activities for improvement of fire fighting system



### Type of training

#### *Description of training, number of participants and equipment used (max 500 chars)*

Advanced courses for Civil protection operators and volunteers with aims at improving the readiness of Civil Protection units to react promptly and efficiently in order to avoid huge human, animal, infrastructure and agricultural losses before, during and after forest fires and earthquakes outbreaks.

Number of participants: 40 Civil Protection Operators & 12 Volunteers that will participate

Equipment used:

- Fire Command Mobile Center with proprietary software and equipment
- Tablets with proprietary software for tough field use  
GPS tracking system for better coordination
- Drones with normal and infra-red cameras
- Adria Fire Propagator
- Adria Fire Monitor
- Adria Fire GIS

### Phases of pilot training

#### *List of the various phases and their brief description (max 2500 chars)*

Advanced Training Campaign for Civil Protection units and volunteers to train and skill them in the use of the fire simulation system (Adria Fire Propagator), video based surveillance system (AdriaFireMonitor), fire analysis & risk modelling system (Adria Fire GIS) during the fire fighting intervention, by implementation of training courses, exercises, drills and simulations supported by manuals, best practices, operational plans and tools capitalized by HOLISTIC project.

n° of training exercises that will be conducted

- n° 2 advanced training courses for Civil protection operators and volunteers
- n° 1 local fire exercises
- n° 1 local earthquake and wild fire combined drills

Type & structure of exercises that will be conducted

- Seminar of Civil Protection Units
- Training of the civil protection forces in case of heavy earthquake

- Civil protection volunteers training course, exercise
- Local earthquake, wild fire drills
- Meeting, practical exercitations and workshops
- Training course (fire on boat)

#### Pilot Team composition

*Brief description of the team composition, detailing requested expertise and background for each member. (max 500 chars)*

- Local Fire Departments
- Croatian Mountain Rescue Service
- Red Cross
- Special Civil Protection Unit
- Others...

#### Enhancement / adoption measures to be implemented

*(max 500 chars)*

- Testing the functionality of the equipment in real terms
- Testing additional equipment installed on the Fire Command Vehicle
- Testing of new advanced functions of field drones
- Testing new advanced GPS devices
- Wider coverage and more advanced features of new GPS devices

#### Expected outputs of pilot training

*(max 500 chars)*

Number of participants:  
40 Civil Protection Operators & 12 Volunteers

- Better training, coordination, faster action & response

- Better and more efficient usage of ICT equipment
- Wider coverage and more advanced features of new GPS devices

#### Estimated budget for pilot training

*(max 500 chars)*

Procured equipment : 30.000€  
 Organization costs: 5.000€

### PP5 - FIRULI VENEZIA GIULIA (FVG)

#### Geographical area

*Brief description of involved area and its substance in terms of seismic & forest fire risks  
 (max 1000 chars)*

The region is characterized by a high seismic hazard. In fact, from a tectonic point of view, Friuli-Venezia Giulia is part of a particularly active geodynamic context, determined above all by the collision between the Adriatic and the European micro-plates. It is in evidence the series of historical earthquakes that hit the FVG and in particular the last, dating back to 1976.

It also derives a morphology articulated in high mountainous percentage, in particular in the northern and eastern part of the Region.

These areas, to which is added the plateau of the Trieste and Gorizia Karst, are also affected by extensive plant cover with mixed deciduous and resinous woods, at high risk of fire. Vulnerability is in some areas increased by difficult access conditions and lack of monitoring and control points

Basic info	
Surface	7.862 km <sup>2</sup>

Population	1.217.872 (2016)
Municipalities	Cities Trieste, Udine, Pordenone e Gorizia; communities: Italiana, slovena, friulana
Bordering area	North: Austria, East: Slovenia; West: Regione Veneto; South: Adriatic Sea





Fig. 1 – 2. Images of high mountain of FVG Region area with wide pine woods and alpine grass land and a long alpine valley.

A joint ITA-CRO exercise will be carried out in the seismic training area of “Portis Vecchia” village, related to seismic risk assessment and procedures to check and detect the real building status. The exercise area is an old village, remained in the same conditions, caused by the '76 earthquake. Between the different buildings can be carried out activities of detection, observation and damage assessment and analysis of the different operational strategies to be adopted in such situations.





Other specific training courses on wild fire will be held at the Regional Operational Room for the training of CP, CFR and firefighter operators using visualization tools for monitoring with new panoramic and thermal webcams.



Maps of wildfires in 2017 by CFR FVG.

Type of training	
<i>Description of training, number of participants and equipment used (max 500 chars)</i>	
Advanced courses for Civil protection operators and volunteers with aims at improving the readiness of Civil Protection units to react promptly and efficiently before, during and after forest fires and earthquakes outbreaks. Training will consist of:	
1)	n° 2 advanced training courses
2)	n° 1 local fire exercises
3)	n° 1 cross border combined drill
4)	n° 1 training seminar for public officers and administrators

Description of structure of training	
<i>List of number &amp; types of training (max 500 chars)</i>	
<p>A) Wild Fire Forest</p> <p>One training module for of PC operators, Forest Corps, VVF and Volunteers, addressed to train and update the DOS (Director of Fire Extinguishing Operations), who coordinates the activities on forest fires, about communications between S.O.R. and AIB groups on the ground, air vehicles, through a specific software 3D simulation system able to reproduce real operative conditions where operators with a trainer may learn how speed up and optimize shutdown interventions improving coordination of air and ground forces to reduce fire damages. For this specific training activity PC FVG plans to adapt and update the software system already supplied some years ago.</p> <p>A second training module will be proposed for Operative room operators for the interpretation of images and data collected by webcams and thermal cameras.</p> <p>During a local fire exercise will be tested the HOLISTIC applications of a drone for support in firefighting activities.</p>	
<p>B) Earthquake Hazard</p> <p>Training about seismic post-earthquake management for PC Operators, regional officers, firefighters, volunteers and public decision-makers.</p> <p>For these training activities, we intend to use and further develop the tools developed in previous phases of the READINESS project and within the Holistic project about SPBs seismic monitoring, integrated with those carried out by PC FVG as a result of operational Protocols with the Universities of Udine and National Fire Brigade (SERM Academy) and the experiences gained following the recent earthquake catastrophes that hit Central Italy.</p>	

A training seminar will be addressed to public officers and administrators to address the administrative aspects of seismic emergency management  
 Training of operators to the use of new quick survey tools will be addressed to the practical application in a combined exercise.

C) ITA - CRO joint seismic and fire exercise in FVG will be discussed together in Dubrovnik.

### Phases of pilot training

*List of the various phases and their brief description (max 2500 chars)*

n° of Civil Protection units/volunteers involved

- n° 20 Civil Protection Operators
- n° 20 CFR/Volunteers will participate

Equipment used:

- Tablets with proprietary software for heavy duty use
- Drone with normal and infra-red cameras
- Fire management 3D simulator system
- Fixed normal and infra-red webcams
- Adria Fire Propagator
- Adria Fire GIS

### Pilot Team composition

*Brief description of the team composition, detailing requested expertise and background for each member. (max 500 chars)*

Civil Protection Operators with different professional background (environmental engineers, geologists, informatics engineers) supported by external experts and scientific support regional Universities according to existing agreements.

### Enhancement / adoption measures to be implemented

*(max 500 chars)*

#### Expected outputs of pilot training

*(max 500 chars)*

- Provide PC Operators with expertise about priority assessments to be performed on buildings damaged by an earthquake;
- Improved rapid damage detection methods in areas hit by an earthquake
- Improved wildfires control and detection capacity
- Civil Protection, Regional forest Corp and Fire Brigade operators trained to management of wildfires extinguishing operations

#### Estimated budget for pilot training

*(max 500 chars)*

PP5 - € WP4 - 90.070,00  
(preliminary quantification to be reviewed)

Training: 10.000,00  
Exercises: 19.000,00  
WebCameras: 34.000,00  
HW & SW: 20.000,00 equipment  
Staff

### PP6- ZADAR COUNTY

#### Geographical area

*Brief description of involved area and its substance in terms of seismic & forest fire risks  
(max 1000 chars)*

In 2017 on the territory of Republic of Croatia a total of 83.000,00 ha of land was burned. From this 83.000,00 ha nationally, a total of 31.793,00 ha of land was burned in Zadar County which makes Zadar County the most forrest fire affected county in Croatia in 2017. During 2015 a total of 5.245 ha of land was burned. In 2016 a total of 6.703 ha of land was burned wich makes an increase of 4 times more burned land in 2017. The largest fires during 2017 happend on 20th and 21st of August - over 30 ha. Mostly Benkovac area – Popovići, Brgud, Podgrađe, Buković, Lepuri, Kožlovac, Ceranje Saint Peter area by the sea, Kožino by the Sea, Island Ugljan - Muline.

Regarding seismic risks, 3 seismic areas in Zadar County according to MCS scale are as follows: VI° (strong) – north County; VII° (very strong) – most of the County is in this zone; VIII° (devastating) – the narrow coastal part and the islands.

Basic info	Zadar County
Surface	7.276,23 km <sup>2</sup>
Population	170.071 (2011)
Municipalities	6 cities; 28 municipalities;
Bordering area	National level – Lika-Senj County, Šibenik-Knin County; International level – Italy, BiH;

Picture of partner country/region



Example of training drill with short description and picture

Type of training
<i>Description of training, number of participants and equipment used (max 500 chars)</i>

Advanced courses for Civil protection operators and volunteers with aims at improving the readiness of Civil Protection units to react promptly and efficiently in order to avoid huge human, animal, infrastructure and agricultural losses before, during and after forest fires and earthquakes outbreaks. Courses will consist of:

- 1) n° 1 advanced training courses for Civil protection operators and volunteers
- 2) n° 1 local fire exercises
- 3) n° 1 local earthquake and wild fire combined drills

#### Phases of pilot training

*List of the various phases and their brief description (max 2500 chars)*

- 1) n° 1 advanced training courses for Civil protection operators and volunteers  
Local Fire Departments, County Fire Association, County Fire Operation Center and other stakeholders will be trained and skilled for the fire fighting intervention, by implementation of training courses, exercises, drills and simulations supported by manuals, best practices, operational plans and tools capitalized by HOLISTIC project. Details still need to be defined.
- 2) n° 1 local fire exercises  
Exercise will simulate an open fire, which will be detected by video surveillance system for early detection alarming the operation center which will dispatch a field unit for fast intervention.
- 3) n° 1 local earthquake and wild fire combined drills  
All Civil Protection units working together in order to save people and property from an object heavily hit by an earthquake in which subsequently fire was started. This will test the operations, coordination and logistics of everyone involved to straighten the cooperation and test new tools in disaster rescue operations.

#### Pilot Team composition

*Brief description of the team composition, detailing requested expertise and background for each member. (max 500 chars)*

To be defined.

<b>Enhancement / adoption measures to be implemented</b>
<i>(max 500 chars)</i>
To be defined.

<b>Expected outputs of pilot training</b>
<i>(max 500 chars)</i>
Civil protection operators and volunteers trained and equipped for the fire fighting intervention and prompt reaction in situation of earthquake.

<b>Estimated budget for pilot training</b>
<i>(max 500 chars)</i>
Estimated budget for external services: 29.950,00 EUR Estimated budget for equipment: 20.000,00 EUR

**TF-2  
Pilot operational SPB Monitor**

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**LP- MOLISE REGION**

<b>Geographical area</b>
<i>Brief description of involved area and its substance in terms of seismic risks (max 1000 chars)</i>

The pilot action will involve the entire area of the Molise Region, with particular attention to the areas located in the municipalities of Campobasso, Campochiaro, Isernia, Termoli and Trivento. These identified areas are particularly sensitive as regards the presence of a high seismic risk. In the last few years many seismic events have affected the area, among which the 2002 earthquake was particularly strong. It hit the Italian regions of Molise and Apulia on 31 October at 10:32:58 (UTC). The shock had a moment magnitude of 5.9 and a depth of 10.0 km (6.2 mi).[1] Most of the victims were killed and injured when a school collapsed in the town of San Giuliano di Puglia: 26 of the 51 schoolchildren died, together with one of their teachers.

Basic info	
Surface	4.438 km <sup>2</sup>
Population	314.725
Municipalities	The Molise Region consists of two provinces: Campobasso and Isernia. In the Region there are 136 municipalities.
Bordering area	Molise is bordered by Abruzzo to the north, Lazio to the west, Campania and Apulia to the south and east. Molise has a small coastline bordering the Adriatic to the northeast.



Fig. 1 Map of the Molise Region



Fig. n. 1 Monitor of a landslide in San Giuliano di Puglia



**Kind of buildings**

*List of number & types of buildings*

The monitoring will involve the following 18 strategic buildings from the logistical and functional point of view:

1. Regional Operational Room of Civil Protection – Campochiaro
2. Central Police Station of Campobasso Sez- Polstrada – Campobasso
3. Central Police Station of Isernia – Isernia

4. Police Station – Termoli
5. Palace of the Regional Council of the Molise Region - Campobasso
6. Carabinieri barracks – Termoli
7. Carabinieri barracks – Isernia
8. Forestry Carabinieri Barracks – Isernia
9. Forestry Carabinieri Barracks – Termoli
10. Fire Brigade Barracks – Campobasso
11. Fire Brigade Barracks – Isernia
12. Station 118 – Trivento
13. Cardarelli Hospital - Block hospitalization 1 – Campobasso
14. Cardarelli Hospital - Block hospitalization 1 – Campobasso
15. Cardarelli Hospital - Central Block 118 – Campobasso
- 16.
- 17.
- 18.

### Phases of campaign

*List of the various phases and their brief description (max 2500 chars)*

1. A preliminary list of structures involved in the survey and monitoring activities has been drawn up. Homogeneous structures have been selected from the point of view of the material (reinforced concrete conglomerate) in order to allow comparative analyzes, albeit in a simplified way.
2. For each building we will proceed, in a first phase, to a dynamic characterization starting from environmental vibration measurements. To measure the structural response, high performance IEPE accelerometric sensors will be used: frequency range from 0.15 to 1000 Hz, resolution 0.000008 g rms, full scale  $\pm 0.5$  g pk and sensitivity 10 V / g.
3. The acquisition system is characterized by 24-bit resolution sigma-delta ADC, with simultaneous sampling and integrated anti-aliasing filter. The dynamic range is more than 100 dB. The measurement chain will therefore allow accurate measurement of vibrations even of

very small amplitude such as those typically found in civil structures under operating conditions.

The number and position of the sensors will vary according to the structural configuration. On average, we will proceed with the installation of eight accelerometric sensors per structure, suitably arranged so as to allow the observability of the fundamental vibration modes. For each building, the instrumental survey activity will last seven days, acquiring data continuously.

4. These data will be analyzed using state-of-the-art analysis methods [1-4]. At the same time, we will proceed to a rapid survey of the structures in order to identify possible structural and non-structural vulnerabilities. To this end, suitable visual relief sheets will be used.
5. From the data collected on the 18 buildings, we will select 5 buildings on which we will operate a second campaign of integrative surveys with mixed techniques (check list, NTC critical survey, structural assessments and integrative dynamic tests) in order to increase the level of knowledge.
6. At the end of the second session of inspections and analyzes, from the 5 buildings evaluated, we will proceed to the identification of 3 buildings, carrying out a thorough evaluation. The objective of the third evaluation and analysis session will be the identification of possible seismic improvement interventions, which will be reported in a technical report, an in-depth document analysis and an additional photographic survey with drone, evaluating both interconnection aspects between buildings and therefore context, both on the building. In addition, an important campaign will be carried out using thermographic techniques to evaluate the efficiency of the building.
7. The data collected, together with the documentation provided by the administrations of the bodies/bodies involved in the surveying and monitoring activities, will be analyzed for the purpose of selecting three buildings from those previously listed for in-depth analysis of instrumental surveys. Non-destructive investigation techniques (such as, for example, infrared thermography) can be used to obtain further qualitative or semi-quantitative information on the structures in-depth, as well as to confirm the data collected in the preliminary screening phase.

#### **Pilot Team composition**

*Brief description of the team composition, detailing requested expertise and background for each member. (max 500 chars)*

The team will involve external experts from the University of Molise (Department of Sciences and Technologies for the Environment and the Territory – Stat) with a high experience in the field of the project. 3/4 departmental resources, including professors and researchers, will be involved in the

project activities. They will carry out monitoring activities under the strict supervision of the Regional Civil Protection.

#### **Enhancement / adoption measures to be implemented**

*(max 500 chars)*

- High performance IEPE accelerometric sensors will be used;
- 8 sensors per building installed;
- The instrumental survey activity will last seven days;
- From the data collected on the 18 buildings, we will select 5 buildings on which we will operate a second campaign of integrative surveys with mixed techniques;
- From the 5 buildings evaluated, we will proceed to the identification of 3 buildings, carrying out a thorough evaluation;
- Results will be reported in a technical report.

#### **Expected outputs of pilot intervention**

*(max 500 chars)*

- First continuous monitoring of 18 SPBs;
- A second campaign of monitoring on 5 SPBs selected buildings;
- Third evaluation on 3 SPBs building;
- 1 technical report.

#### **Estimated budget for pilot training**

*(max 500 chars)*

Estimated costs:

- 3) External expertise: 37.900,00 euro
- 4) Equipment: 13.000,00 EURO

## PP1- DUBROVNIK NERETVA REGION

### Geographical area

*Brief description of involved area and its substance in terms of seismic risks (max 1000 chars)*

Dubrovnik and Neretva Region (DNR), the southernmost Croatian Region, is located within seismotectonically very complex and active region. DNR is the region with the highest defined seismic hazard in Croatia with PGA values on bedrock (soil type A according to Eurocode 8) exceeding values of 0.3 g (475-year return period) in most of the Region, including area of the City of Dubrovnik. During the history, it was affected by destructive earthquakes several times (e.g. 1667, 1979, 1996), which clearly demonstrates that destructive earthquakes are one of the largest natural disasters in this region. Even today this area is seismically very active and possible consequences of a stronger earthquake would significantly affect people and structures and would be a huge drawback for the economic development of this part of Europe. Having in mind the level of seismic hazard, number of people and the amount of property that are exposed to seismic hazard, DNR is undoubtedly an area of high seismic risk.

Basic info	
Surface	9.272,2 km <sup>2</sup>
Population	122 870
Municipalities	5 cities, 17 communities
Bordering area	Italy, Bosna and Herzegovina, Montenegro

Picture of partner country/region.

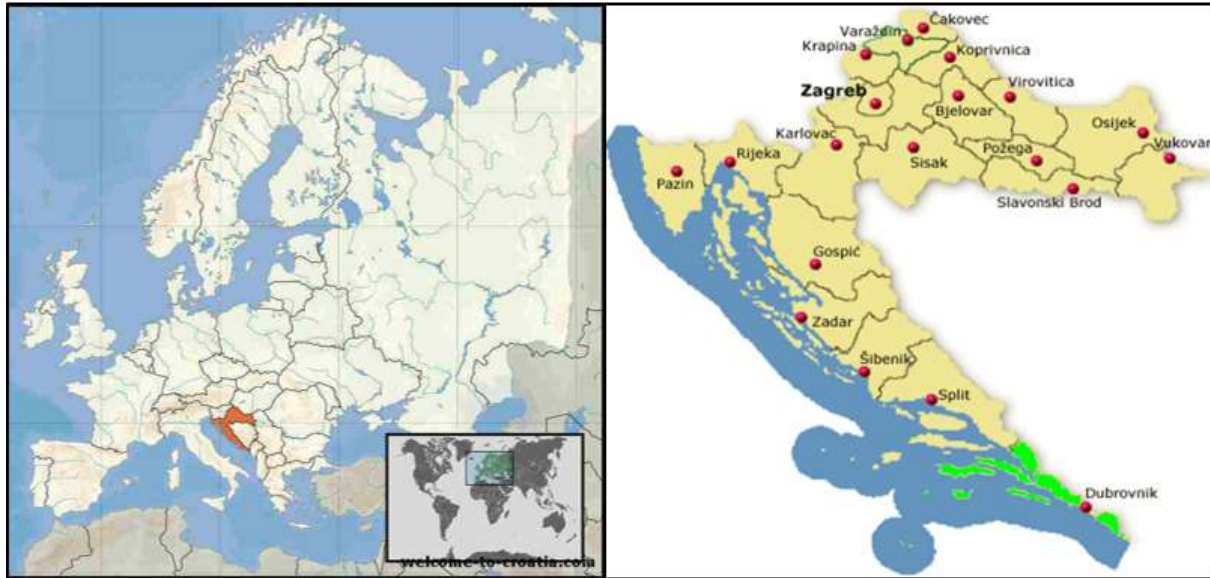


Figure 1. Left: Map of Europe with Croatia marked in orange. Right: Map of Croatia with Dubrovnik and Neretva Region marked in green.

Example of building with short description and picture



Figure 2. Dubrovnik Hospital – object D: seven (7) storey RC building.

### Kind of buildings

*List of number & types of buildings (max 500 chars)*

In Croatia there is no law defining which building is SPB. Therefore, SPB's are defined as buildings of importance class III and IV, as defined by Eurocode 8 (Class III: Buildings whose seismic resistance is of importance in view of the consequences associated with a collapse, e.g. schools, assembly halls, cultural institutions etc. Class IV: Buildings whose integrity during earthquakes is of vital importance for civil protection, e.g. hospitals, fire stations, power plants, etc.)

### Phases of pilot intervention

*List of the various phases and their brief description (max 2500 chars)*

1. Passive measurements for 15 SPB's in DNR
  - 1.1. Selection of 15 SPB's in DNC.
  - 1.2. Measurements of dynamic parameters of 15 SPB's and of underlying soils, using microtremor as an excitation signal (passive measurements).
  - 1.3. Ground screening of the SPB's.
  - 1.4. Data analysis and interpretation. Identification of SPB's risk of soil-building resonance.
2. Visual and dimensional screenings for 5 SPB's in DNR
3. Detailed seismic analysis for 1 SPB in DNR
  - 3.1. Selection of 1 SPB in DNR
  - 3.2. Measurements of dynamic parameters of 1 SPB and of underlying soils, using microtremor as an excitation signal (passive measurements).
  - 3.3. Installation of accelerometer or seismometer for continuous instrumental monitoring of 1 SPB for a time period of at least 1 (one) month in order to monitor its structural integrity and response to ground shaking induced by an earthquake
  - 3.4. Operational modal analysis (OMA) performed in order to provide fundamental modal shapes together with corresponding natural frequencies and damping coefficient which will be used for calibration of initial numerical model constructed on the basis of the collected building data and field surveys.
  - 3.5. Derivation of synthetic accelerograms (several different scenarios) which will be used as the representative earthquake scenarios - estimation of representative ground surface shaking on the location caused by an earthquake
  - 3.6. The seismic vulnerability assessment made on the basis of the obtained results, including the building collapse mechanism and identification of critical structural elements

4. Presentation of final results in the form of Report

**Monitoring Team composition**

*Brief description of the team composition, detailing the requested expertise and background of each member (max 500 chars)*

Seismologist – special areas of knowledge - seismology, engineering seismology, earthquake engineering, seismic hazard and risk, microseismic noise spectrum

Civil engineer - special areas of knowledge – earthquake engineering, numerical modeling of structures, seismic vulnerability of buildings, seismic risk assessment

**Enhancement adoption measures to be implemented**

*(max 500 chars)*

Dubrovnik and Neretva Region will have the relevant data regarding seismic risks on its territory and possible influence to the SPBs. These data are considered extremely useful for and will be incorporated into the future civil protection plans necessary for the improvement of the civil protection system in general. The importance is greater taking into consideration the fact that the DNR is the territory, cut off from the rest of the country and the EU territory.

**Expected outputs of pilot intervention**

*(max 500 chars)*

Dynamic parameters of SPB's and underlying soil will be estimated in order to identify possible resonance phenomena which may cause severe structural damage or even collapse of buildings during earthquake shaking. For each SPB risk of soil-building resonance will be estimated, which can be used as an indicator of the level of seismic vulnerability of the building. This identification of buildings which will result the weakest under the seismic shaking will help in mitigating seismic risk in DNR.



Estimated budget for pilot intervention

*(max 500 chars)*

The budget is subject to the public procurement procedure. The estimation of the costs of the planned DNR activities is estimated at 40 000 EUR.

**PP 2- MARCHE REGION**

**Geographical area**

*Brief description of involved area and its substance in terms of seismic risks (max 1000 chars)*

In the Marche Region, the seismicity is characterized by a series of moderate-to-large historical and recent earthquakes. The 2016-2017 Central Italy sequence caused fatalities and damage in an area of 60 km along the Apennine chain. The damaged area is still active at present day. Another recent seismic sequence started in 1997 (the Umbria-Marche sequence).

There are areas characterized by a different level of hazard, but the seismic risk is uniform and medium level. The Apennines have in fact stronger and more frequent earthquakes, but it is sparsely populated (low exposure) and many buildings have been restructured after the earthquakes of 1997 (low vulnerability). The coastal area has less frequent and relatively less severe earthquakes, but is densely inhabited and houses most of the industries. The municipalities have undergone adequate seismic regulations since 1980. Only 20% of buildings have a low level of maintenance.

Basic info	
Surface	9.401 km <sup>2</sup>
Population	1,551 million

<p>Municipalities</p>	<p>Marche is divided in five districts: Ancona (administrative center), Fermo; Pesaro e Urbino, Macerata, Ascoli Piceno. Total number of municipalities: 236.</p>
<p>Bordering area</p>	<p>To the north the Marche borders with Emilia-Romagna (province of Rimini) and the Republic of San Marino; to the west with Tuscany (province of Arezzo), Umbria (province of Perugia) and Lazio (province of Rieti); to the south with Abruzzo (province of Teramo) and to the east with the Adriatic Sea.</p>





Figure 2. Example of Strategic Public Building monitored: Treia municipality. Masonry building built in the year 1773, last improvements made in 1973. Mansory typology: solid bricks and lime mortar masonry, horizontal structures truss with semirigid slabs and pushing and heavy roofing, foundation mat/plate.



Figure3. Example of Strategic Public Building monitored: Sant'Angelo in Vado municipality. Masonry building, last improvements made in 2005. Masonry typology: undressed stone masonry with facing walls of limited thickness and infill core, horizontal structures truss with semirigid slabs and deformable slabs, deep foundation.

#### Kind of buildings

*List of number & types of buildings (max 500 chars)*

Continuous monitoring of the 11 SPB already instrumented in Holistic project. SPB already instrumented are located in these municipalities: Apecchio, Castelraimondo, Fano, Fiuminata, Montecalvo in Foglia, Montappone, Matelica, Sant'Angelo in Vado, Sassocorvaro, San Severino Marche and Treia. The most part of SPB are masonry buildings and only one is reinforced concrete (Sassocorvaro municipality).

New sites will be instrumented: 4 buildings (Monte Monaco, Moresco and Monte San Martino municipality and Università Politecnica delle Marche) already instrumented within the convention between INGV and Marche Region will be integrated into the project Readiness; 4 new SPB (choose of building in progress) will be instrumented at the base of structures. Two buildings will be chosen among all those monitored with sensors at the base where 2 low-cost accelerometers will be installed on a higher floor. The chosen SPB's are public buildings (schools, municipalities...).

#### Phases of pilot intervention

*List of the various phases and their brief description (max 2500 chars)*

- 1) At the beginning, the inspection and survey to choose new SPBs will be performed. Moreover, the performance of new type of low-cost accelerometers will be checked by laboratory and field tests.
- 2) In each new SPB, at least three temporary seismic noise measurements will be recorded to analyze the frequency of the fundamental mode of vibration of the structure and the frequency of the resonance of the soil. Later, additional temporary measurements will be carried out in some SPBs struck by 2016 earthquakes to evaluate changes in the fundamental frequencies.

3) Permanent seismic instrumentation will be installed at the base of the selected 4 buildings. The aim is to record strong motion during significant seismic events. The data will be sent in real time to the acquisition centre of the Ancona - INGV headquarters and stored locally on a compact flash inside the instrument. The seismic signals of earthquakes with local magnitude  $\geq 3.0$  will be processed to evaluate engineering parameters with semi-automatic procedures purposely developed. Additionally, low-cost MEMS accelerometers will be installed in high floors of 2 structures to experiment a gradual expansion of the monitoring.

4) During the project information on surface geological and morphological characteristics will be collected through thematic and digital maps. The information will allow to propose a classification of the various categories of the sites according to Eurocode 8 for the subsoil and topographical conditions.

5) Parameters chosen to characterize the SPB site (geographical location, geological and morphological information and classification, seismic amplification, characteristics of building and its fundamental frequency and strong motion parameters) will be organized in a MySQL database. This database will be useful to compile the instrumental seismic history of the structure. The results will be disseminated through a dynamical website regulated by a data policy to select the technical data sheets for each seismic site and the results of temporary surveys.

6) Update of MOST website, management of permanent stations. Work café with stakeholders, eg Belforte del Chienti (volunteers) and Università Politecnica di Ancona with the engineers.

#### **Monitoring Team composition**

*Brief description of the team composition, detailing the requested expertise and background of each member (max 500 chars)*

The team will consist of external expertise from Istituto Nazionale di Geofisica e Vulcanologia (INGV), Osservatorio Nazionale Terremoti (ONT), Sede di Ancona, composed of 4 researchers and a technician. The team will evaluate the sites for the installation of the instruments, the choice of seismic sensors, evaluation of site effects, seismic monitoring, analysis of seismic signal (noise and earthquakes).

Moreover, the team also is composed by personnel of the Civil Protection of Marche Region to assist surveys and search for cartographic and digital material.

#### Enhancement adoption measures to be implemented

*(max 500 chars)*

- Developing a procedure combining low cost and non invasive measurements
- Test low-cost accelerometers
- The new monitored SPBs will be chosen in the areas hit by the sequence of Central Italy, allowing the test of the procedures and dissemination of the information to a target sensitive after the earthquake. In two buildings, the monitoring will be expanded.
- Measurements on some SPBs affected by the earthquakes
- Semi-Automatic procedures will be optimized to make information available soon after seismic events
- Involvement of the administrations of the monitored SPBs, through material that describes the project and workshop/seminar.

#### Expected outputs of pilot intervention

*(max 500 chars)*

- Expansion of the continuous monitoring (total 18/19 SPBs)
- Dataset of temporary measures and estimate of the vibration frequencies of the SPBs and soil
- Study on the performance of low-cost sensors for permanent monitoring and examples
- Dissemination of the results by a web portal and through seminars/workshops.
- Comparison with the target group representative (i.e., engineers) to evaluate the methodologies and practices of the monitoring carried out.

#### Estimated budget for pilot intervention

*(max 500 chars)*

Estimated cost

Technical External expertise (all included: travel, installed new seismic sensors, upgrade of database and web site, field campaign).

Budget 101.964 EUR (vat include)

500 euro for Civil Protection Staff

### PP 3- SPLIT-DALMATIA COUNTY

#### Geographical area

*Brief description of involved area and its substance in terms of seismic risks (max 1000 chars)*

The Mediterranean is one of the areas that lie on the border between the Eurasian and African tectonic plates. The African plate falls under the Eurasian slab (subdubic zone), and in these areas, seismic energy is released in the form of weaker and stronger earthquakes.

Split-Dalmatia County is located on one of those “high risk” areas and as such is prone to frequent seismic activities. On average there are hundred of smaller tremors and dozens of stronger earthquakes notable annually, some of which regularly cause extensive damage of different intensity.

According to the map of seizmic vulnerability of Split Dalmatia County the most indangered area is in north- south part of County, mainly between city of Sinj, Imotski and Makarska.

Basic info



Surface	14.106,40 km <sup>2</sup>
Population	454.798
Municipalities	16 cities; 39 communities
Bordering area	Bosnia & Hercegovina & Italy (overseas)



Picture of partner country/region

Example of building with short description and picture

#### **Kind of buildings**

*List of number & types of buildings (max 500 chars)*

Split-Dalmatia County has chosen 10 public buildings (schools) in north- south part of Split- Dalmatia County as Strategic Public Buildings in the County. Duo to the frequent seismic activity on that area we consider it is the most adequate to implement the pilot operational plan on those objects.

#### **Phases of pilot intervention**

*List of the various phases and their brief description (max 2500 chars)*

Phase 1: Visual screening of the buildings

Collection of documentation, estimation of the vulnerability index and categorization of the buildings according their vulnerability (this phase will be carried out for all of the analyzed buildings).

Phase 2: Measurements of dynamic parameters for the building and underlying soil (this phase will be carried out for all of the analyzed buildings)

Phase 3: Soil classification

According to Euro-code 8 based on the value of average shear wave velocity which is obtained by seismographs (applied to 20% or two of the selected buildings with high value of vulnerability index and/or in danger of soil-structure resonance)

Phase 4: Evaluation of the behaviour of the building subjected to design acceleration and

estimation of failure mechanism and collapse ground acceleration.  
(this phase will be carried out for 20% or two of the analyzed buildings)

Phase 5: Preliminary building Seismic reinforcement design  
(this phase will be carried out for one of the analyzed buildings that studies show is the most endangered)

Phase 1 – 4 completion time-frame: September 2018. to March 2019.

Phase 5 completion time-frame: March to May 2019.

#### **Monitoring Team composition**

*Brief description of the team composition, detailing requested expertise and background for each member (max 500 chars)*

Team composition will be composed of external experts (2-3 Geologists/Civil Engineers/Architects ) appointed according to the principles of transparency and the best price / quality ratio and involvement of target groups.

#### **Enhancement adoption measures to be implemented**

*(max 500 chars)*

Using the latest technology in measuring seismological risks in public buildings in Split-Dalmatia County for the first time. Primary beneficiary will be public schools because we feel children deserve the highest safety standards. Also school objects can be used as shelters in case of big hazards.

#### **Expected outputs of pilot intervention**

*(max 500 chars)*

As a result of this pilot actions ten public schools will have defined seismic parameters which will be used as a base for different architectural redesigns, reconstructions and similar architectural improvements in order to ensure minimising seismic risk of those objects.

#### Estimated budget for pilot intervention

*(max 500 chars)*

- Phase 1: (~ 3.125 EUR per building)  
External expertises: *to be contracted*  
Equipment: *provided by contractor*
- Phase 2: (~ 1.500 EUR per building)  
External expertises: *to be contracted*  
Equipment: *provided by contractor*
- Phase 3: (~ 3.125 EUR per building)  
External expertises: *to be contracted*  
Equipment: *provided by contractor*
- Phase 4: (~ 4.375 EUR per building)  
External expertises: *to be contracted*  
Equipment: *provided by contractor*
- Phase 5: (~ X.XXX EUR per building)  
External expertises: *to be contracted*  
Equipment: *provided by contractor*

#### PP 5- FRIULI VENEZIA GIULIA

##### Geographical area

*Brief description of involved area and its substance in terms of seismic risks (max 1000 chars)*

The region is characterized by a high seismic hazard. In fact, from a tectonic point of view, Friuli-Venezia Giulia is part of a particularly active geodynamic context, determined above all by the collision

between the Adriatic and the European micro-plates. It is in evidence the series of historical earthquakes that hit the FVG and in particular the last dating back to 1976.

It also derives a morphology articulated in high mountainous percentage, in particular in the northern and eastern part of the Region.

Basic info	
Surface	7.862 km <sup>2</sup>
Population	1.217.872 (2016)
Municipalities	Cities Trieste, Udine, Pordenone e Gorizia; communities: Italiana, slovena, friulana
Bordering area	North: Austria, East:Slovenia; West: Veneto Region; Suoth: Adriatic Sea

Picture of partner country/region

Example of building with short description and picture

**Kind of buildings**

*List of number & types of buildings (max 500 chars)*

18 strategic buildings, most located in little towns of FVG Region, will be monitored.

These strategic buildings have been chosen to between the buildings identified in municipal emergency plans as sites of strategic functions during emergencies: Town Hall, Local Police headquarters, CP headquarters, Forest Fire Brigade offices, etc.

Some buildings have just been investigated in Holistic previous monitoring campaigns, and some new sensors will be implemented to have continuous monitoring of the building.

Chosen buildings have different construction features: the recent buildings, realized after the 1976 big earthquake, are usually made of concrete, older buildings are supported by masonry with bricks/squared stones and the oldest ones are often realized with rounded stones.

More detailed information on structural details will be collected during the measurement campaign and visual screening.

### Phases of pilot intervention

*List of the various phases and their brief description (max 2500 chars)*

The objective of the pilot intervention is to develop monitoring procedures that, through the use of low-cost instruments and through dynamic experimental analysis, allow to evaluate the vibrational characteristics of strategic buildings and to make judgments about their status based the variations found in subsequent experimental campaigns or through changes in parameters derived from continuous monitoring.

For this purpose, instruments (accelerometers and velocimeters) capable of recording the three components of environmental seismic noise will be used. Noise measurements will be conducted in succession on the structures that will be investigated (in various positions and at different floors) and in the free field at a distance from those. The study of the relationships between the noise spectra obtained on the structure in the different positions and those related to the free field will allow a clear identification of the first vibration modes of the structure (flexural and transversal).

The comparison of the vibrating mode of the structure with the fundamental frequency of the site deduced from the analysis of the measurements performed in the free field and elaborated with the Nakamura (HVSR) method allows then to estimate any possible phenomena of seismic resonance.

This estimate is of great importance if we consider that under the action of an earthquake both a building than the foundation soil behave like oscillating systems with their own period and

consequently the most severe damage occurs when a structure presents ways of vibration close to the frequencies proper of the ground.

To analyze the dynamic characteristics of the building in more detail, the damping calculation will also be carried out.

For this purpose, the RDM (Random Decrement Method) will be used related to the fundamental frequency only; for a building its typical value ranges between 1 and 10% while its variations can be correlated to damages.

Another index to be calculated in order to evaluate the characteristics of the structure is the vulnerability index, this index was introduced by Nakamura (2000) and is defined as the ratio:

$$K_b = \frac{A}{(2\pi F)^2} \cdot \frac{10000}{H}$$

where:

A: floor amplification;

H: height of the structure in meters.

F: frequency

By reporting this data to the change in frequency that is found before and after an earthquake, it has been noted that the damage increases with the increase of this index, even if there are no "absolute" references to link this value to a probable damage in a preventive phase analysis.

Tests will be carried out will allow to obtain indispensable information to eventually develop models that are able to simulate the real behavior of buildings and derive indications that can be used for diagnostic purposes, through appropriate procedures.

In addition to these "ground screening" activities, it is also intended to make comparisons between measuring instruments with possible joint monitoring with other Project Partners. Activity will be conducted with internal staff, purchasing new equipment and using the one already acquired in the Holistic Project.



Visual and dimensional screening will be done using Holistic forms adapted in a web database of monitored buildings (at least 5 buildings) .

#### **Monitoring Team composition**

*Brief description of the team composition, detailing requested expertise and background for each member (max 500 chars)*

Internal expertises: 2 geologist and 2 civil engineers

External expertises: scientific support based on preexisting agreements with National Institute for Oceanography and Applied Geophysics -OGS and University of Udine and Trieste.

#### **Enhancement adoption measures to be implemented**

*(max 500 chars)*

#### **Expected outputs of pilot intervention**

*(max 500 chars)*

A goal of the project is to implement the network of monitored buildings, to collect data and implement procedures for post-earthquakes evaluations; moreover a new report form will be adopted to enhance the Holistic one allowing even a fast monitoring after an earthquake to rapidly check the structural behavior with the comparative analysis of continuously recorded data.

#### **Estimated budget for pilot intervention**

(max 500 chars)

€ 20.000,00 for instruments

€ 2.455,00 internal expertises

## PP 6- ZADAR COUNTY

### Geographical area

*Brief description of involved area and its substance in terms of seismic risks (max 1000 chars)*

Regarding seismic risks, 3 seismic areas in Zadar County according to MCS scale are as follows:

VI° (strong) – north County; VII° (very strong) – most of the County is in this zone; VIII° (devastating) – the narrow coastal part and the islands.

Basic info	Zadar County
Surface	7.276,23 km <sup>2</sup>
Population	170.071 (2011)
Municipalities	6 cities; 28 municipalities;
Bordering area	National level – Lika-Senj County, Šibenik-Knin County; International level – Italy, BiH;

Picture of partner country/region



Example of building with short description and picture

### Kind of buildings

*List of number & types of buildings (max 500 chars)*

Considering the time of construction and type of construction, we can bring a rough estimate of their seismic resistance. The area of Zadar County can be divided into V categories of objects according to the type of housing construction:

- I - masonry buildings up to 1920 - ceiling structures exclusively made of wood - 10%
- II - masonry buildings with reinforced concrete springs from 1921 to 1945 - 5%
- III - reinforced concrete skeleton buildings from 1946 to 1964 - 15%
- IV - reinforced-concrete supporting wall system from 1965 to 1980 - 50%
- V - skeletal buildings with reinforced concrete barriers from 1980 to present - 20%

The measurement will be at 10 SPB and determination of SPB will be based on importance of buildings for Zadar County and on soil and geological data. Measurements will be performed at schools, emergency medical help building, County building, and buildings which determines the Law on Critical Infrastructures (NN 56/13) in the Zadar County.

### Phases of pilot intervention

*List of the various phases and their brief description (max 2500 chars)*

- Instrumental monitoring

Phase 1:

- Measurements of microseismic disturbance on the ground (at the foot of the building) and on the top floor of the building. Measurements are performed on 10 selected SPB, minimum one measurement on the ground and one on the top of the building. Total 20 measurements.

- Calculation of HVSr spectrum, dominant ground frequency and building frequency. Preparation of the preliminary report.

Phase 2:

- Repeat measurement after six months in the same buildings and positions.

- Calculation of HVSr spectrum, dominant ground frequency and building frequency. Preparation of the preliminary report.

Preparation of the Phase 1 and Phase 2 measurement results, comparison of dynamic parameters of Phase 1 and Phase 2, Absorption Risk Assessment in Earthquake.

- Visual and dimensional screening

The evaluation of Seismic Structural Hazard Scale of in danger of soil-structure resonance buildings will be made by a professional team through visual and dimensional screening of its structural characteristics, result of instrumental monitoring and conservation status then evaluation will be described in the elaborate. This phase will be carried out for 20% (equal to two buildings) of all the analyzed buildings.

- Preliminary building Seismic reinforcement design

When measurements, visual and dimensional screening are made then preliminary building seismic reinforcement design will be approach. This phase will be carried out for one of the analyzed buildings that studies show is the most endangered.

### **Monitoring Team composition**

*Brief description of the team composition, detailing requested expertise and background for each member (max 500 chars)*

2-3 Geologists/Civil Engineers/Architects.

#### Enhancement adoption measures to be implemented

*(max 500 chars)*

Repetition of temporary measures on some SPBs in order to investigate changes in the characteristics of oscillation of the structures.

#### Expected outputs of pilot intervention

*(max 500 chars)*

No. 10 SPBs Instrumentally monitored; Visually and dimensional screening for 2 SPBs completed; Preliminary building Seismic reinforcement design prepared for 1 SPB;

Data analysis and interpretation. Presentation of final result in the form of Report, presenting for each SPB estimations of its dynamic parameters and danger of the soil-structure resonance during earthquakes, and results of monitoring structural integrity of SPB by identifying possible changes in dynamic parameters due to the natural degradation of material properties and/or the cumulative damage from continuous low-level seismic activity, including results from continuous instrumental monitoring of one SPB for time period of at least 6 (six) months.

Prepared guidelines for performing passive measurements of microvibrations of buildings and microtremor measurements in the nearby free-field, which are used for estimation of dynamic parameters of buildings and danger of the soil-structure resonance during earthquakes.

#### Estimated budget for pilot intervention

*(max 500 chars)*

- Instrumental monitoring and Visual and dimensional screening: *cca 33.000 EUR*  
External expertise: *to be contracted*  
Equipment: *defined in coop. and with the assistance of contracted expert*

- Preliminary building Seismic reinforcement design: *to be defined*  
 Equipment: *to be contracted*  
 Equipment: *defined in coop. and with the assistance of contracted expert*

### TF-3

#### Pilot Operational Plan for Citizen Raise Awareness

#### LP- MOLISE REGION

##### Geographical area

*Brief description of involved area and its substance in terms of seismic & forest fire risks (max 1000 chars)*

The pilot action will involve the entire area of the Molise Region, with particular attention to the areas located in the municipalities of Campobasso, Campochiaro, Isernia, Termoli and Trivento. These identified areas are particularly sensitive as regards the presence of a high fire and seismic risks. Only in 2017, about 100 fires have spread in the Molise Region for a total of 1300 hectares of destroyed territory. In addition, in the last few years many seismic events have affected the area, among which the 2002 earthquake was particularly strong. It hit the [Italian](#) regions of [Molise](#) and [Apulia](#) on 31 October at 10:32:58 (UTC). The shock had a moment magnitude of 5.9 and a depth of 10.0 km (6.2 mi).<sup>[1]</sup> Most of the victims were killed and injured when a school collapsed in the town of [San Giuliano di Puglia](#): 26 of the 51 schoolchildren died, together with one of their teachers.

<b>Basic info</b>	
Surface	4.438 km <sup>2</sup>

Population	314.725
Municipalities	The Molise Region consists of two provinces: Campobasso and Isernia. In the Region there are 136 municipalities.
Bordering area	Molise is bordered by Abruzzo to the north, Lazio to the west, Campania and Apulia to the south and east. Molise has a small coastline bordering the Adriatic to the northeast.

#### Type of campaign

*Description of awareness campaign, number of participants, target groups and methodologies used (max 500 chars)*

The pilot action will promote 2 Info days which will involve 250 pupils and 250 citizens each. Specifically, each event will be organized in Campobasso and will be opened to schools of the Molise Region with children between 10 and 15 (Scuole Secondaria di Primo Grado – Secondary Schools of First Degree) and adults also. The event will be organized in close collaboration with the Regional Civil Protection of the Molise Region.

A contemporary awareness campaign will be launched through social networks (Facebook and Twitter mainly) considering the strong use that young people make of them nowadays.

## Phases of campaign

*List of the various phases and their brief description (max 2500 chars)*

The Awareness campaign will be scheduled according to the following phases:

### **Event n. 1**

Location: Campobasso

Duration: 1 day

Timetable: date to be chosen between 1 December 2018 and 31 January 2019

Brief agenda:

9.00-10.00: Forest fires in the Molise Region

10.00-11.00: Areas at risk of earthquake in Molise

11.00- 12.00: How to behave in case of forest fires

12.00-13.00: How to behave in case of earthquakes

13.00-14.00: The role of social networks in case of an emergency and how to use them efficiently.

### **Event n. 2**

Location: A square or a wide open space in Campobasso.

Duration: 1 day

Timetable: date to be chosen between 1 December 2018 and 31 January 2019

Brief agenda:

10.00-14.00: 1 Civil Protection Exercises and 1 exhibition of CP vehicles and equipment.



#### **Pilot Team composition**

*Brief description of the team composition, detailing requested expertise and background for each member. (max 500 chars)*

The team composition will involve experts with different skills. Staff of the Molise Region and of the Civil Protection Department will collaborate for the success of the activity. In addition, the Molise Region will contract a communication and civil protection expert who will take care of the thematic aspects of the awareness campaign.

#### **Enhancement / adoption measures to be implemented**

*(max 500 chars)*

To improve citizens' knowledge of Civile Protection organization and functions, how to cooperate and have proper behaviour in case of Forest fire and earthquake hazardous situation.

#### **Estimated budget for pilot training**

*(max 500 chars)*

- Communication and civil protection expert: € 6.000,00 euro.
- Communication materials: € 1.500,00 euro

#### **Expected outputs of pilot training**

*(max 500 chars)*

During the awareness campaign, will be delivered the following communication materials: leaflets; gadgets (bookmarks and pencils) for pupils. In addition PPT presentations, videos and other materials will be produced for the activity.

## PP 1- DUBROVNIK NERETVA REGION

### Geographical area

*Brief description of involved area and its substance in terms of seismic & forest fire risks  
(max 1000 chars)*

The Dubrovnik and Neretva Region is the southernmost region of the Republic of Croatia and it is territorial organized into 22 units of local government and self-government with 5 cities and 17 municipalities. The regional center is the City of Dubrovnik. The Region consists of two basic functional and physiognomic units: a relatively narrow longitudinal coastal area with a string of offshore islands and closer islands and the area of Lower Neretva with its gravitating coastal zone. The Region is divided by the state border line with Bosnia and Herzegovina. The area of the Region has all the characteristics of the Mediterranean climate. According to the official Risk Assessment of the DNR forest fire and earthquake are the highest ones. The DNR has been hit by serious fire in 2015 when a great surface of the Pelješac peninsula burned down causing great damage in agriculture and tourism. The last greater earthquake hit the DNR in 1996.

Basic info	
Surface	9.272,2 km <sup>2</sup>
Population	122 870
Municipalities	5 cities; 17 communities
Bordering area	Italy, Bosnia and Herzegovina, Montenegro

Picture of partner country/region



Figure 1. Republic of Croatia with Dubrovnik and Neretva Region marked in green

Example of citizen rise awareness campaign with short description

**Type of campaign**

*Description of the awareness campaign, the number of participants, target groups and methodologies used*

*(max 500 chars)*

DNR intends to accomplish the outputs by combining these campaigns along with the organization of the civil protection forces. Citizens awareness campaigns are considered very important as the basis of subsidiarity rule in civil protection systems. Target groups are school children and students, as well as citizens in general since their participation in the civil protection exercise is expected. The expected number of participants which will be included in different awareness campaigns is estimated at 100. Exhibition of the CP equipment will be organized after one of the exercises.

### **Phases of campaign**

*List of the various phases and their brief description (max 2500 chars)*

Each awareness campaign will have three main phases: planning, implementing and analysis. The campaign is planned mainly in September since the school year finishes in June. The planning phase will be discussed with the teachers and with the representatives of the civil protection forces since their enrollment is crucial. The importance of joint actions will be stressed as well as the necessity of preserving valuable natural heritage that DNR bears. Inclusion of the citizens during the civil protection forces will be discussed during the preparation meetings. Organization of the exhibition will be dedicated to covering as much as possible citizens. The cross-border awareness day for children will be a subject joint consortium activity.

### **Pilot Team composition**

*Brief description of the team composition, detailing the requested expertise and background of each member. (max 500 chars)*

These activities will be performed by the representatives of the civil protection forces and members of Civil Protection Headquarters who are well acquainted with the project and its goals. The representatives of the National Rescue and Protection Directorate will be included in every activity aimed to the citizen awareness campaigns.

### **Enhancement / adoption measures to be implemented**

*(max 500 chars)*

More detailed participation of the school children in citizen's awareness campaigns which will be a significant contribution to the civil protection system in the DNR in general. Preparedness for unexpected disasters, fires and earthquake, improved.

### **Estimated budget for campaign**

*(max 500 chars)*

The estimated costs are supposed to cover the costs of printing different dissemination materials. The costs are estimated to 3500 EUR. Educational dissemination materials for the HOLISTIC project will be used as well (puzzles, picture and coloring books).

#### **Expected outputs of the campaign**

*(max 500 chars)*

Prevention of consequences of fires and earthquake improved as well as the level of prevention.

### **PP2- MARCHE REGION**

#### **Geographical area**

*Brief description of involved area and its substance in terms of seismic & forest fire risks*

*(max 1000 chars)*

In the Marche Region, the seismicity is characterized by a series of moderate-to-large historical and recent earthquakes. The 2016-2017 Central Italy sequence caused fatalities and damage in an area of 60 km along the Apennine chain. The damaged area is still active at present day. Another recent seismic sequence started in 1997 (the Umbria-Marche sequence).

There are areas characterized by a different level of hazard, but the seismic risk is uniform and medium level. The Apennines have in fact stronger and more frequent earthquakes, but it is sparsely populated (low exposure) and many buildings have been restructured after the earthquakes of 1997 (low vulnerability). The coastal area has less frequent and relatively less severe earthquakes, but is densely inhabited and houses most of the industries.

The 89% of Marche region is hilly or mountain territory. 30% of this territory is covered by forest. Several small villages and towns are close to forest areas and vulnerable to forest fire, especially in summer seasons.

Basic info	
Surface	9.401 km <sup>2</sup>
Population	1,551 million
Municipalities	<p>Marche is divided in five districts: Ancona (administrative center), Fermo; Pesaro e Urbino, Macerata, Ascoli Piceno. Total number of municipalities: 236</p>
Bordering area	<p>To the north the Marche borders with Emilia-Romagna (province of Rimini) and the Republic of San Marino; to the west with Tuscany (province of Arezzo), Umbria (province of Perugia) and Lazio (province of Rieti); to the south with Abruzzo (province of Teramo) and to the east with the Adriatic Sea.</p>



Fig. 1 Marche Region territories





Fig. 2 - draft of the info day panel. Seminar will take place at Polytechnic University of Ancona, involving students of Science-Civil protection course and Engineering courses

**Type of campaign**

*Description of awareness campaign, number of participants, target groups and methodologies used (max 500 chars)*

- a) n° 1 Info day for academic student at University of Ancona in November 2018
- b) n° 1 local earthquake simulation with school evacuation

It will take place in Belforte del Chienti Municipality (1889 inhabitants). A primary or middle school will be involved.

On this occasion, educational materials will be disseminated to the population (see also the operational plan for SPB and training course).

The exercise will be performed in October 2018, at the end of the seismic training course for volunteers and the debriefing will be done within November to evaluate performance and criticalities.

- c) n° 1 Exhibition of Civil Protection vehicles and equipment
- d) n° 1 Cross border Awareness Day for Children

### Phases of campaign

*List of the various phases and their brief description (max 2500 chars)*

- a) Info day will involve both students of Science-Environmental risk and civil protection course and Engineering courses. Behaviours during and after an earthquakes will be analysed and new installed seismic equipment on University tower showed and obtained results presented.
- b) Exercise scenario will be set up by INGV expert and the Civil Protection Service of the Marche Region. Volunteers trained in the recent course will participate as observers. Simulation will be video reported, in order to analyse behaviours and procedures adopted. Debriefing with assessment of any critical issues will be realized within November 2018.
- c) Fully equipped vehicles will be displayed on a public place together with other equipment used in disaster situation (in Belforte del Chienti, after the conclusion of the school evacuation simulation - *to be confirmed*).
- d) Cross border Awareness Day for Children will consist of presenting Civil Protection units and their role in disaster situations, and educative discussion about how to behave and cooperate in case of forest fire and earthquake hazardous situations (1<sup>st</sup> of March 2019 – Belforte del Chienti school - *to be confirmed*).

### Pilot Team composition

*Brief description of the team composition, detailing requested expertise and background for each member. (max 500 chars)*

- 7 regional civil protection officers
- 4 INGV technicians

#### **Enhancement / adoption measures to be implemented**

*(max 500 chars)*

Improving territorial resilience during and after an earthquake shake. Enhance citizens's awareness and knowledge related to seismic and fire risk

#### **Estimated budget for pilot training**

*(max 500 chars)*

5.000 euro for catering and civil protection volunteers reimburse

Budget for trainers is already included in the external expertise amount indicated in the Pilot operational SPB monitoring

2.500 euro for Civil Protection Staff

#### **Expected outputs of pilot training**

*(max 500 chars)*

Illustrative and educative materials based on presentations, leaflets, brochures, will be produced during project implementation in order to be illustrated during targeted lessons and meetings with students, public events with citizens and seminars for public decision-makers, to enhance their awareness of natural risks and improve territorial resilience.

Testing and evaluating school evacuation operative procedures

### PP3- SPLIT-DALMATIA COUNTY

#### Geographical area

*Brief description of involved area and its substance in terms of seismic & forest fire risks  
(max 1000 chars)*

The Mediterranean is one of the areas that lie on the border between the Eurasian and African tectonic plates. The African plate falls under the Eurasian slab (subdubic zone), and in these areas, seismic energy is released in the form of weaker and stronger earthquakes.

Split-Dalmatia County is located on one of those “high risk” areas and as such is prone to frequent seismic activities. On average there are hundred of smaller tremors and dozens of stronger earthquakes notable annually, some of which regularly cause extensive damage...

In terms of seismic hazard that is why we choose to direct our efforts to north Dalmatia, mainly between city of Sinj, Imotski and Makarska.

In the area of Split-Dalmatia County throughout the year there is a constant high risk of forest fires, especially during the summer season do to a large income of tourists.

Forest fires in SDC are of great concern because of geological property of the area involved, common drought's and highly flammable vegetation consisting mostly of underbrush and pine trees in coastal area and islands. That is the area we will focus most of our fire hazard prevention efforts.

Basic info	
Surface	14.106,40 km <sup>2</sup>
Population	454.798
Municipalities	16 cities; 39 communities
Bordering area	Bosnia & Hercegovina & Italy (overseas)

**Picture of partner country/region**



#### **Example of citizen rise awareness campaign with short description**

While implementing HOLISTIC project Split Dalmatia County organized workshop in which members of the DVD Sinj held a lecture for the students and the simulation of rescue from a burning building, fire fighting in the open field and with extinguishing foam and with automatically guided water gun.

The workshop was attended by the 205 schoolchildren, school teachers and representatives of DUZS Split, Town of Sinj, and representatives of Split-Dalmatia County.



### Type of campaign

*Description of awareness campaign, number of participants, target groups and methodologies used  
(max 500 chars)*

#### **Main Objective of Pilot “Awareness raise campaign to improve citizens’ promptness”**

To improve citizens’ knowledge of Civil Protection organization and functions, how cooperate and have proper behavior in case of Forest fire and earthquake hazardous situations.

#### **Target groups**

##### ***Children and school-age youths:***

Info days with combined illustration of correct preventive, reactive and cooperative behavior in case of hazardous situations;

Involvement in rescue and evacuation activities during Civil protection simulations/exercises;

Cross-border Awareness Day for Children – one Common Cross-border Raising Day addressed to spread a culture of adequate natural hazards prevention into children.

Participation in exhibitions with demonstrations of Civil Protection vehicles and equipment.

##### ***Adult citizens:***

Participation in exhibitions with demonstrations of correct preventive, reactive and cooperative behavior in case of Forest fire and earthquake hazardous situations.

Involvement in rescue and evacuation activities during Civil protection simulations/exercises;

**Number of participants:** A total of 600 children and 800 adults involved/participating in C.P. simulations & exercises, exhibition, info days and Crossborder Awareness Day.

### Phases of campaign

*List of the various phases and their brief description (max 2500 chars)*



- Exhibition of Civil Protection vehicles and equipment. Fully equipped vehicles will be displayed on a public place together with other equipment such as, computers, cameras, drones, tablets and other high-tech ICT solutions used in disaster situations.
- Wildfire and combined Civil Protection simulations & exercises will consist of virtual simulation on our Adria Fire GIS and Adria Fire Propagator software simulator together with live demonstration exercise of most commonly encountered situations in firefighting and rescue operations.
- Cross border Awareness Day for Children will consist of presenting Civil Protection units and their roll in disaster situations, and educative discussion about how to behave and cooperate in case of forest fire and earthquake hazardous situations.
- Info day for general population will consist of demonstrating the Civil Protection units, the way they operate and their roll in disaster situations. Also there will be demonstrations of correct preventive, reactive and cooperative behavior in case of forest fire and earthquake hazardous situations. Past experiences and future plans and improvements on making the force more effective will also be presented.

#### **Pilot Team composition**

*Brief description of the team composition, detailing requested expertise and background for each member. (max 500 chars)*

- Local Fire Departments
- Croatian Mountain Rescue Service
- Red Cross
- Special Civil Protection Unit
- Others...

#### **Enhancement / adoption measures to be implemented**

*(max 500 chars)*

The application of a proactive approach to education of children and adults on hazard (earthquake/fire) response. Creating leaflets and instructions on how to deal and help each other in case of a hazardous situations.

#### **Estimated budget for pilot training**

*(max 500 chars)*

Promotion materials: 5.000€

Organizational costs: 10.000€

#### **Expected outputs of pilot training**

*(max 500 chars)*

Info days and rescue exercises mainly addressed to children and school-age youths and exhibitions with demonstrations of Civil Protection vehicles and equipment and involvement in drills and simulations, addressed to adult citizens and supported by booklets, video and publications derived from HOLISTIC and PROMPT similar outcomes. Deliverable of implementation of pilot project activities will be 600 children and 800 adults informed/trained how to behave in case of fire and earthquake.

### **PP 5- FRIULI VENEZIA GIULIA**

#### **Geographical area**

*Brief description of involved area and its substance in terms of seismic & forest fire risks*

*(max 1000 chars)*

The region is characterized by a high seismic hazard. In fact, from a tectonic point of view, Friuli-Venezia Giulia is part of a particularly active geodynamic context, determined above all by the collision between the Adriatic and the European micro-plates. It is in evidence the series of historical earthquakes that hit the FVG and in particular the last dating back to 1976.

It also derives a morphology articulated in high mountainous percentage, in particular in the northern and eastern part of the Region.

These areas, to which is added the plateau of the Trieste and Gorizia Karst, are also affected by extensive plant cover with mixed deciduous and resinous woods, at high risk of fire. Vulnerability is in some areas increased by difficult access conditions and lack of points of sight and sighting.

Basic info	
Surface	7.862 km <sup>2</sup> km <sup>2</sup>
Population	1.217.872 (2016)
Municipalities	Cities Trieste, Udine, Pordenone e Gorizia; communities: Italiana, slovena, friulana
Bordering area	North: Austria, East:Slovenia; West: Regione Veneto; South: Mare Adriatico

#### Type of campaign

*Description of awareness campaign, number of participants, target groups and methodologies used*

*(max 500 chars)*

Awareness campaign will be adressed to students, scholars and citizens with differnt kind of activities

- 1) For students will be organized specific activities on READINESS themes during annual **Civil Protections Schoolcamps** organized by the Civil Protection of Autonomous Region Friuli Venezia Giulia for high school students. During a week-long stage students follow theoretical lesson about civil protection, risks, emergency and safety procedures; on seismic and wild fire risk the

main activities of READINESS Project will be presented by CP technicians in a special Awareness day. Participation of students from Croatia partners regions will be evaluated with school authorities.

- 2) **Info Days** for schools and citizens with visit of CP operative center in Palmanova (CP Open Days).
- 3) **Thematic workshops** and seminars targeted for public officials and decision-makers and CP volunteers

### Phases of campaign

*List of the various phases and their brief description (max 2500 chars)*

- 2 Workshops for volunteers on seismic risk to update procedures of post-earthquake reporting according to existing procedures in autumn 2018.

- Pilot activities will be illustrated during annual Volunteer's meeting in December 2018, with exhibition of CP equipment and vehicles.

- 1 Info Days for public officials and decision-makers for the presentation of main results of READINESS Project activities will be organized in winter 2018-2019.

- 2 Open info days for citizens will be organized from October 2018 to January 2019, one during the combined earthquake and wildfire drill.

- Crossborder awareness day for children on 1 march 2019

- 1 awareness day will be held during school camps in spring 2019, with possible visit by foreign delegations.

### Pilot Team composition

*Brief description of the team composition, detailing requested expertise and background for each member. (max 500 chars)*

Operators of PC and other organizations (CFR, VVF, ...) with support from scientific institutions  
Volunteers with experiences on wildfires, seismic risk and communication / dissemination activities

**Enhancement / adoption measures to be implemented**

*(max 500 chars)*

Effective illustrative materials based on presentations, videos and leaflets will be produced during project implementation in order to be illustrated during targeted lessons and meetings with students, public events with citizens and seminars for public decision-makers, to enhance their awareness of natural risks and best behaviours to improve people resilience to them.

**Estimated budget for pilot training**

*(max 500 chars)*

Promotional material and brochures for Info Days and public activities with students and volunteers.

€ 6.250,00

**Expected outputs of pilot training**

*(max 500 chars)*

**PP 6- ZADAR COUNTY**

**Geographical area**

*Brief description of involved area and its substance in terms of seismic & forest fire risks*

*(max 1000 chars)*

In 2017 on the territory of Republic of Croatia a total of 83.000,00 ha of land was burned. From this 83.000,00 ha nationally, a total of 31.793,00 ha of land was burned in Zadar County which makes Zadar County the most forest fire affected county in Croatia in 2017. During 2015 a total of 5.245 ha of land was burned. In 2016 a total of 6.703 ha of land was burned which makes an increase of 4 times more burned land in 2017. The largest fires during 2017 happened on 20th and 21st of August - over 30 ha. Mostly Benkovac area – Popovići, Brgud, Podgrađe, Buković, Lepuri, Kožlovac, Ceranje

Saint Peter area by the sea, Kožino by the Sea, Island Ugljan - Muline.

Regarding seismic risks, 3 seismic areas in Zadar County according to MCS scale are as follows:

VI° (strong) – north County; VII° (very strong) – most of the County is in this zone; VIII° (devastating) – the narrow coastal part and the islands.

Basic info	Zadar County
Surface	7.276,23 km <sup>2</sup>
Population	170.071 (2011)
Municipalities	6 cities; 28 municipalities;
Bordering area	National level – Lika-Senj County, Šibenik-Knin County; International level – Italy, BiH;

Picture of partner country/region



Example of citizen rise awareness campagne with short description

#### Type of campaign

*Description of awareness campaign, number of participants, target groups and methodologies used*

*(max 500 chars)*

- a) n° 1 Exhibition of Civil Protection vehicles and equipment as well as combined Civil Protection simulation and exercise
- b) n° 1 Cross border Awareness Day for Children (preparatory info day + awareness day)
- c) n° 1 Info day for general population

#### Phases of campaign

*List of the various phases and their brief description (max 2500 chars)*

- a) Exhibition of Civil Protection vehicles and equipment. Fully equipped vehicles will be displayed on a public place together with other equipment such as, computers, cameras, drones,

tablets and other high-tech ICT solutions used in disaster situations. Combined Civil Protection simulation & exercise will consist of virtual simulation together with live demonstration exercise of most commonly encountered situations in firefighting and earthquakes rescue operations.

b) Cross border Awareness Day for Children will consist of presenting Civil Protection units and their roll in disaster situations, and educative discussion about how to behave and cooperate in case of forest fire and earthquake hazardous situations.

c) Info day for general population will consist of demonstrating the Civil Protection units, the way they operate and their roll in disaster situations. Also there will be demonstrations of correct preventive, reactive and cooperative behavior in case of forest fire and earthquake hazardous situations. Past experiences and future plans and improvements on making the force more effective will also be presented.

#### **Pilot Team composition**

*Brief description of the team composition, detailing requested expertise and background for each member. (max 500 chars)*

Team will be composed as follows:

1 subcontracted PR expert who will be responsible for visibility and promotional materials and who will coordinate whole campaign in close cooperation with:

1 person from the Administrative Department for Physical Planning, Environmental Protection and communal affairs of ZC which carries out administrative and expert work on protection and rescue, civil protection, fire and flood protection, and elemental disasters, demining activities, defence preparation work, and drafting of acts in accordance with special laws in these area;

1 person form Zadar County Headquarter for Protection and Rescue which is in charge in case of hazards- coordination of all institutions/units for protection and rescue- fireman, police, emergency.

#### **Enhancement / adoption measures to be implemented**

*(max 500 chars)*



Stakeholder participation could be improved by longer and wider awareness raising campaign of all the stakeholders.

**Estimated budget for pilot training**

*(max 500 chars)*

Contract for PR expert : 5.990,00 EUR

**Expected outputs of pilot training**

*(max 500 chars)*

All three events (Exhibition of Civil Protection, Cross border Awareness Day for Children and Info day) successfully organized with efficient participation of involved stakeholders and target groups.