



# **PUBLIC AWARENESS AND EDUCATION TOOLS FOR DISASTER RISK REDUCTION AND PREPAREDNESS IN EARTHQUAKE SITUATION**

COORDINATING CENTRE: ECBR, Romania

PARTNER CENTRES: ECMNR, Moldova, ECRP, Bulgaria

REPORT ON THE RESULTS OBTAINED WITHIN THE COORDINATED  
PROJECTS FOR 2015

## ECBR

### 1. REPORT ON WORK PACKAGE 1

Seminar to evaluate the collected material on the best approach to rise earthquake risk awareness (Participants from specialized centers of Bulgaria and Greece).

#### 1.1. Organizing aspects

The seminar was organized at premises of URBAN-INCERC / ECBR in the days of October 15 and 16. 2015.

Due to some special political and personal situations, participants from R. Moldova, Ukraine and Cyprus were unable to attend. The Appendix A gives the list of participants.

ECPFE – EPPO, Athens, Greece participated with two representatives, but the transportation and hotel expenses of the second member were supported by ECPFE.

AFEM Ankara, Turkey was invited as a substitute but there was not time for making their local arrangements for travel.

Besides ECBR members, there was a large number of Romanian participants attending some presentations, as in the enclosed list.

Two directors schools for students with disabilities attended the Seminar:

- Prof. Eng. Cristian IONESCU, Director General, Special Vocational School nr.2 , Sector 2, Bucharest
- Prof. Radu Catalin Cristian, Director General, Special High-School Nr. 3 , Sector 2, Bucharest

#### 1.2. Contributions and presentations

During the Seminar the following contributions were presented:

- ECBR Contributions - Presentations:
  - Delivery of knowledge transfer and training, using new earthquake education tools for public employees and population, including people with disabilities.
    - Dr. Emil Sever GEORGESCU, Director ECBR: Evolution and present requirements of public earthquake awareness and education tools in Romania.
    - Dr. Daniela DOBRE, Dr. Emil-Sever GEORGESCU, Dr. Claudiu-Sorin DRAGOMIR: Training and Awareness for Seismic Risk Experiences. Presentation and demonstration of using mini-didactic simulators
    - Assoc. Prof. Dr. Iolanda Gabriela CRAIFALEANU: Proposals on improved content of web site for education on risk reduction, with Euro-Mediterranean coverage.

- ECRP, European Centre for Risk Prevention, Sofia, Bulgaria:
  - Mr. Kolio KOLEV, Director: Public Awareness and Educational Tools to Reduce Disaster Risk and Preparation for an Earthquake Situation (Bulgaria) (Existing Situation and Good Practices)
- ECPFE, Athens, Greece:
  - Eng. Evangelia Linda PELLI, Dep. Director: Contribution on "Greek's Earthquake Protection Policy for People with disabilities".

The contributions of R. Moldova and Ukraine were available, as well as other reports of ECRP and ECPFE and they were used in drafting the deliverables:

- ECMNR – Mr. Anatolie BANTUS, Director: European Centre for Mitigation of Natural Risks, Chisinau, R. Moldova: Contribution on Mitigation of Natural Risks in R. Moldova
- TESEC, Mr. Viktor POYARKOV, Executive Director, TESEC - European Centre of Technological Safety, Kiev, Ukraine: Contribution on Mitigation of Natural Risks in Ukraine

### 1.3. Presentation and evaluation of the collected material

ECBR - EMIL SEVER GEORGESCU, DIRECTOR ECBR: EVOLUTION AND PRESENT REQUIREMENTS OF PUBLIC EARTHQUAKE AWARENESS AND EDUCATION TOOLS IN ROMANIA.

ECBR – EUROPEAN CENTER FOR BUILDINGS REHABILITATION is a specialised center included in URBAN-INCERC and is based on a Memorandum of Accession to The European and Mediterranean Major Hazards Agreement (EUR-OPA), adopted by the Romanian Government in 2001. EUR-OPA was created as an open co-operation group by the Committee of Ministers of the Council of Europe in 1987, and it is an appropriate tool to tackle the disaster risk reduction issues. Since 2009, according to the Government Decision 1398 / 2009, ECBR is included in the structure of URBAN-INCERC, as a result of merging between INCERC, URBAN-PROIECT and CDCAS, and since 2010 it was a new merging with NCSR – National Center for Seismic Risk Reduction (a former JICA Project Unit). Presently, *ECBR* is located in the premises of the National Institute for Research and Development in Constructions, Urbanism and Sustainable Territorial Development URBAN-INCERC, INCERC Bucharest Branch, under specific coordination of Ministry of Regional Development and Tourism.

- In areas exposed at Vrancea earthquakes there is some 35% of Romania's population, over 66% of urban population, while in areas exposed at shallow earthquakes it is exposed over 10% of urban population of Romania.
- Great earthquakes are at some 30 - 40 years average interval
- Traditional buildings have a moderate vulnerability, do not produce mass casualties
- Still exist some hundreds of pre-1940 high/rise buildings in Bucharest !?! 120 buildings listed at highest risk – public danger in Bucharest
- Many buildings designed and erected under State quality control since 1950's

The main field of ECBR, as “building rehabilitation” must be considered with due care about its important relationships with the vulnerability of persons that live in buildings at risk, with human habitat in urban and rural environment, with technical codes and laws on related aspects, including socio-economic and ethical aspects. The researchers of URBAN-INCERC / ECBR contributed to very important codes for evaluation and rehabilitation of buildings, as well as manuals for earthquake education during last years. It is important that the present field of research of URBAN-INCERC can provide for a more interdisciplinary approach of disaster risk reduction, at building and urban fabric scale, in correlation with sustainable development.

It is important to remark that the situation of buildings rehabilitation in Romania is as follows:

- the attitude of owners of apartments in high-rise vulnerable buildings is contradictory – they do not cooperate enough for strengthening.
- since adoption of the Law O. G. 20 /1994 there are steps of decisions with a chain of communication to the owners, these must be treated with other tools than purely administrative ones.
- some owners are afraid of apartment mortgaging, many are rather old, low-income, absentees or just do not want to be disturbed by evacuation and noisy works.
- some owners and even some lawyers and court judges were confused in their decisions;
- mass-media showed a contradictory behaviour, wrote papers with a lot of criticism to authorities and sometimes to engineers for the slow pace of rehabilitation, but published numerous unreliable seismic predictions, that are misleading for citizens’ behaviour.

ECBR is concerned with the connection that was made between the vulnerability of buildings and the need to rehabilitate them, overpassing the gaps of peoples risk perception, administrative shortcomings and slow pace of strengthening works in Bucharest. The recognized quality and number of activities for earthquake education of school students and citizens, that must overcome the negative impact of mass-media coverage with catastrophic content.

Earthquake education and disaster mitigation strategies include:

- Earthquake design of new buildings according to codes in force
- Repair, strengthening and fixing of buildings and equipments
- Personal and/or family - group preparedness
- For protection and rational reaction in case of earthquake and disasters

Education includes – information – training – long-term education and aims at:

- learning to live and to survive in seismic zones
- behave in a rational and efficient way in case of seismic shaking, to not believe in rumors
- prevent disasters and cooperate to recovery after such events

Individual experience is very important. In Romania, almost 58% of population does not have direct earthquake experience, because Vrancea strong motions are at large time intervals

Since 1990 INCERC - MLPAT - Materials for Citizens education in Romania: safety and behaviour recommendations. The first programme for earthquake public education was initiated after the 1990 Vrancea earthquakes and approved by the Government Decision no. 644/1990 and coordinated by INCERC included:

- development of posters, booklets and illustrated folders for incidence of earthquakes in buildings, built environments and settlements;
- earthquake preparedness manuals (practical guides), for people, children and school staff, as well as for different categories of professions and population at risk;
- short documentary video films with earthquake safety and preparedness rules.

New set of booklets for schools – INCERC 2007, contract with MDRAP / MTCT, with JICA Assistance:

- For classes 1 and 2 of primary school, only posters are used as mean of visual communication and the rules of behaviour were first of all emphasised.
- For classes 3 and 4 of primary schools, the knowledge is provided by specific rules of preparedness and behaviour before, during and after earthquakes, as a booklet and posters. The manuals indicate what a family plan contains and show childrens how to draw maps with their daily way to school and how to identificate hazards.
- For classes 5 to 8, the booklet starts with knowledge about origin and patterns of earthquakes, specific scientific terms, scales of magnitude and intensity. A greater extent is given to active identification of hazards at home and in neighbourhood, to a family plan, while the rules of behaviour are more detailed.
- For high-school students, the basic content is enlarged, some photographs of 1977 Romanian earthquake damage are included and more technical explanations, meant to convinge not only by rules and orders, as one
- would expect a greater implication in understanding risks and active individual protection or protection of family members and within school groups and community. Some photographs with actual dangerous old building members (chimneys, gable walls, cracked masonry) were included.

Available at <http://www.incerc2004.ro/index-r.htm> "Educatia si protectia elevilor in caz de cutremur" serie de indrumare elaborate de INCERC (format "pdf");

MDRAP [http://www.mdrl.ro/documente/constructii/educatie\\_cutremur/Clasa%20V%20&%20VIII%20nw.pdf](http://www.mdrl.ro/documente/constructii/educatie_cutremur/Clasa%20V%20&%20VIII%20nw.pdf)

These booklets have been put also on websites of other institutions and schools, as:

- City Hall of Bucharest City - under a protocol with ISU Bucuresti (2014), <http://pompiieriromanieu.wordpress.com/2014/03/10/protocol-de-colaborare-intre-i-s-u-bucuresti-primaria-capitalei-si-i-s-bucuresti/>
- French Highschool Bucharest - <http://www.lyceefrancais.ro/pdf/seisme/collegero.pdf>

- ISU Dobrogea - <http://www.isudobrogea.ro/wp-content/uploads/2012/05>.
- Social network Cutremur. Net - <http://www.cutremur.net/p/educatia-si-protectia-in-caz-de-cutremur.html>

The ongoing ROEDUSEIS Project allowed also the drafting of new manuals with earthquake protection knowledge.

In Romania, the number of persons with disabilities is rather large, and two large categories are living, learning, working and moving in quite the same places with us, they are blind or with reduced capacity to see, and deaf and mute, while others are using wheelchairs.

Their capability to protect is different of ours, some understanding may be different, thus we must elaborate separate sections of our materials, while the conveying media could be different. We need to get closer to their way of living and learn how the general expertise is useful to them.

In Romania there are at least 3 main associations in this field, they are of blinds, of deaf and mute, and of persons with moving handicaps, and there is a Government Department for persons with disabilities. Some special schools exist too. ECBR has studied the issue of people with disabilities in the past and has drafted some documentary materials.

ECBR - DANIELA DOBRE, EMIL-SEVER GEORGESCU, CLAUDIU-SORIN DRAGOMIR: TRAINING AND AWARENESS FOR SEISMIC RISK EXPERIENCES. SYNERGY AND OUTREACH IN ECBR ACTIVITY CORRELATED WITH RESEARCH ACTIVITIES

In Romania, almost 58% of population does not have direct earthquake experience, because vrancea strong motions are at large time intervals. Therefore, in the process of earthquake information and education, some gaps are easily identifiable, as:

- the implementation of educational materials for the population is a difficult process, and mass-media plays in many cases a negative role, releasing mostly catastrophic views;
- for usual disasters, most of information is just a warning and not a preparedness activity; as earthquakes cannot be predicted, the safety must be learned in advance;
- there are no specific institutional structures to provide earthquake education for population;
- the public institutions staff is not educated for specific tasks, as to protect their assets and to have a role in communication with citizens;

Examples - ROEDUSEIS PROJECT that has as partners:

- NIEP-National Institute for Earth Physics
- URBAN-INCERC
- BABES-BOLYAI UNIVERSITY
- BETA IT Company

The educational objectives refer to:

- training of students and teachers in the record, analysis and interpretation of data recorded using dedicated seismometers installed in schools
- the development of practical skills to work with seismic waves and other earthquake parameters
- to introduce knowledge on earth and earthquakes, understanding the natural environment patterns and attract students to geosciences
- to create a database of seismic records from equipments installed in schools.
- schools from 9 cities throughout the country are involved in Roeduseis-Net and they are equipped with performance seismographs.

Results and URBAN-INCERC contributions are:

- pilot manuals dedicated to education and training of students and teachers
- primary level - effects of earthquakes on the built environment: School building and the earthquake. school buildings can sometimes suffer serious damage, partial or total collapse.
- secondary level - effects of earthquakes on the built environment: The structural system and the earthquake. spatial framework (columns + beams), with vertical structural walls and concrete floors.
- high school level - Effects of earthquakes on the built environment: The structural system and the earthquake. plan framework (columns + beams), with vertical structural elements and concrete floors, infrastructure and ground foundation.
  - the new proactive approach is that students are the makers of models and simulators, using them to understand the concept and make real observations.
  - frame models are made of cardboard and infilling walls of polystyrene and may show the fundamental aspects of the buildings oscillations, when shaken.
  - their response aims especially to understand the behavior of the slender tall buildings vs. stiff and low structure, deformation of soft-story structures, and to understand the role of bracings and the structural walls.
  - the question of the ways in which we could favorably influence the understanding, perception and implicit the personal and public decision acts on seismic protection is considered.
  - the seismic generation mechanism is used in scientific and educational activities on soils patterns/models, structures, equipments. seismic motions can be simulated, based on actual or generated records (artificial accelerograms), being projected simultaneously by video the effects.
  - with a mini earthquake simulator, which creates two types of motions, high or low frequency, oscillations are applied to simple models of buildings (metal, wood, paper), consisting of a

framework/structure with or without structural walls or filling, with or without ground/weak level/flexible floor etc.

## CONCLUSIONS

- Earthquake education has a specific pattern in Romania. ECBR and URBAN-INCERC aimed to achieve (by everything they did) a proactive (anticipatory and participatory), rather than reactive, attitude!
- INCERC Bucharest Branch initiated and supported drafting of earthquake education and preparedness materials for citizens, students, teachers.
- ECBR organized in 2015 many technical demonstration and presentation on earthquake preparedness for students of schools and universities, as well as for other citizens;
- URBAN-INCERC proposed a special structure to solve the problem – a centre and demonstrative platform, to be used also in ECBR activities.
- there is a need of a further knowledge transfer and dissemination about risk mitigation from specialists and authorities to the citizens and school students, for learning how to protect and proceed to building rehabilitation.
- public perception can be influenced positively by participating in such demonstrations. in many cases, teaching simulators facilitate a culture of disaster prevention (in schools or at general public level).
- the continuity of seismic simulation demonstrates that, to check some certain concepts and the structural systems, laboratory tests are required, of which purpose can exceed the interests of engineering and assuming a specific social role.
- There is a need of synergy between research, education and implementation of prevention measures! (common directions of ECBR and other projects)

ECBR - IOLANDA CRAIFALEANU: PROPOSALS ON IMPROVED CONTENT OF WEB SITE FOR EDUCATION ON RISK REDUCTION, WITH EURO-MEDITERRANEAN COVERAGE

In Romania we benefit of several types of resources:

- INFORISX - Website for information on seismic risk in Romania
- Brochures for schools and colleges – all levels of pre-university education
- Posters
- Specific regulatory body in Romania. Institutional collaboration (General Inspectorate for Emergency Situations, Ministry of Education and Scientific Research)
- Expertise from past and ongoing projects



INFORISX: Website for information on seismic risk in Romania

In Romania strong crustal earthquakes occur at large intervals - at present about 50% of the exposed population did not witness such events and have no experience on protection and behaviour. Statistical data show that about 35% of the total population of the country, percent which includes over 66% of the urban population, is exposed to Vrancea earthquakes. In Romania, perceptible ground motions occur frequently enough, we need permanent awareness of seismic risk in the population.

Providing correct and systematic information in the field, through the most efficient communication channels it is a key issue in the mitigation of the potential earthquake effects.

The Internet ranks third in Romania, with 30%, after television and radio broadcasts, on the list of media channels used by the public for information.

Project developed in collaboration by INCD URBAN-INCERC (project leader), Technical University of Civil Engineering Bucharest, UTCB, URL: <http://inforisx.incerc2004.ro>. The website is organized in 3 main sections: About Earthquakes, Seismic Data, Seismic Protection.

*About Earthquakes:*

- Seismicity of Romania (Main seismic sources that affect the country, with particular attention to the Vrancea subcrustal source; Brief information on the destructive Vrancea earthquakes of 1977 and 1940; Two earthquake catalogues)
- Seismic Design Codes (information on the evolution of seismic design codes in Romania, from the provisional instructions issued in 1941 until the present codes)
- Seismic Macrozonation (list of consecutive standards concerning the macrozonation of Romania; The evolution of macrozonation is traced back to 1952, the year of the enforcement of the first regulation in the field; For each standard, macrozonation maps are given)

*Seismic Data* (scientific information and data on the strongest earthquakes that occurred in Romania since 1977; several links to the INCERC website (seismic data, maps and information on seismic networks in Romania; presentation of the strong ground motion database of INCERC Bucharest, including processed data, as well as response spectra; numerical data, information and maps for a number of more recent seismic records from significant earthquakes with  $M_w \geq 5$ ).

*Information for citizens, authorities and media*

- The subsection is divided into chapters, according to the target audiences (dwellings, schools, museums, medical facilities, educational facilities, large indoor spaces)

*Downloadable resources* (Brochures developed by INCERC Bucharest in collaboration with the Romanian Ministry of Education and aimed for instructional use in primary, middle and high schools; Collection of printable posters on seismic education).

#### *Discussion forum*

- The feedback received by the authors since INFORISX was first published online, as well as the evolutions that occurred both in the knowledge in the field and in the information presentation techniques, suggested various possible developments and improvements of the website
- Future work is planned, including the development of the English version of the website, which would ensure a larger audience of its content

#### *Specific regulatory body in Romania*

- Regulations for school preparedness:
- Order of the Ministry of Internal Affairs No. 1508 of 20 November 2006 for the development and implementation in the educational system of the National Program for Antiseismic Education of Students.
- Protocol on training in emergency situations of children, pupils and students in national pre-university and higher education institutions, by MAI (Ministry of Internal Affairs) and MEN (Ministry of National Education), No. 62170/9647/2013.
- Institutional collaboration
  - General Inspectorate for Emergency Situations (Ministry of Internal Affairs)
  - Ministry of Education and Scientific Research

#### *ECBR Project may use expertise from past and ongoing projects*

- RoEduSEIS (Romanian Educational Seismic Network)
- E-PreS (Monitoring and Evaluation of Natural Hazard Preparedness at School Environment)
- SEISMOCODE (Lifelong E-Learning Platform for Active Implementation of the New Romanian Seismic Regulations Harmonized with European Standards)
- E-PreS (Monitoring and Evaluation of Natural Hazard Preparedness at School Environment)

#### *E-PreS (Monitoring and Evaluation of Natural Hazard Preparedness at School Environment):*

Coordinator: National and Kapodistrian University of Athens (UoA), Greece;

Partners:

1. Earthquake Planning and Protection Organisation (EPPO), Greece
2. INCED-“URBAN INCERC”, Romania

3. University of Crete-National History Museum of Crete (UoC-NHMC),
4. Istituto Nazionale di Geofisica e Vulcanologia sezione di Napoli, Osservatorio Vesuviano (Vesuvius Observatory), Italy

Center for Educational Initiatives Association (CEI), Bulgaria

- Addressed to the prevention phase against natural hazards
- Main goal: design and evaluation of drills for emergency mitigation
- Main objectives: to identify, share and implement best practices and methodologies gained from previous EU projects and partners activities; to create smart tools which define, simulate and evaluate all hazards emergency steps and be customized to the unique district, school, and campus; to involve the collaboration of interested parties and (4) to include pupils with disabilities and special needs.

*SEISMOCODE (Lifelong E-Learning Platform for Active Implementation of the New Romanian Seismic Regulations Harmonized with European Standards)*

National collaborative project. Coordinator: Technical University of Civil Engineering Bucharest, Partners: INCD "URBAN-INCERC", Institute for Computers, ITC S.A.

The platform will support professional post-graduate and lifelong learning programs and will represent a useful teaching resource for graduate and post-graduate university programs.

The specific proposals on improved content of web site for education on risk reduction, with euro-mediterranean coverage will be presented in the Workpackage 2.

KOLIO KOLEV, EUROPEAN CENTRE FOR RISK PREVENTION (ECRP), SOFIA, BULGARIA

PUBLIC AWARENESS – AND EDUCATIONAL TOOLS TO REDUCE DISASTER RISK AND PREPARATION FOR AN EARTHQUAKE SITUATION (BULGARIA) (EXISTING SITUATION AND GOOD PRACTICES)

1. Legal Basis for the training of young people and the population in disaster protection (in particular earthquake) in Bulgaria.

Training in risk prevention in Bulgaria is based on the Disaster Protection Act. This Act regulates the provision of public health protection and protection of the environment and property in the event of disaster. Disaster protection is implemented through: preventive activities (before), protective activities (during) support and relief work (after). Preventive activities are a complex of measures, including also training of the population, as well as monitoring and warning of various hazards.

According to the Disaster Protection Act, training in disaster protection and giving first aid is provided in the public education system and in higher education institutions. The Disaster protection Act provides for the acquisition of basic knowledge on disaster risks and ways of behavior and action in primary education and in secondary and higher education – knowledge on protection corresponding to the profile and specialty. The Minister of Education and Science in consultation with Minister of Interior approves training programs, teaching materials and training aids for

kindergartens and schools and training plans for preparation for disaster protection of managerial staff and teachers in the system of education.

The Disaster Protection Act was developed based on the principle: "right of every person to protection". According to the Crisis Management Act, in declaring a "disaster Situation": Children and people in disadvantaged position shall to taken care of, in the event that in a disaster situation this care cannot be taken by the people who usually take it.

2. Curricula and contents of collections of educational and training materials on activities in cases of disasters, emergencies, accidents and fires.

Classes in Disaster Protection will take place:

- During the so called "form tutor session" (one academic hour per week) – the form tutors will be responsible for the implementation;
- As separate topics or educative points as part of other school subjects in accordance with the curricula approved by the Ministry of Education and Science.

Content of the Training and Methodological Aid

- for formation of tutors of 1-st to 4-th grade

Section 1: Disaster Protection.

- Blast;
- Thunderstorm, lightning;
- Snowstorm;
- Earthquake;
- Flood, torrent, landslide;
- Personal protection equipment;
- Population warning alerts case of disasters and accidents;
- The rescuer's vocation.
- Section 2: Fire Safety and Rescue.
- Section 3: First Aid.

For formation of tutors of 5-th to 8-th grade.

Section 1: Protection in the event of disasters, emergencies and accidents:

- Fifth grade – Students behavior and action in the event of pollution of various types.

- Sixth grade – Civil Protection alerts. Rules for action on Civil Protection Alerts.
- Seventh grade – Toxic substances. Ways of protection against toxic substances.
- Eighth grade – Behavior rules and action of students in the event of disasters, emergencies and accidents (summarizing lesson).

Section 2: Fire and Emergency Safety.

Section 3: Psychological support in disasters, emergencies and accidents.

The topic of earthquake is covered separately in the primary and elementary education course only – from First to Eighth Grade. From Ninth to Twelfth Grade, the topic of earthquake is included as an educative point and is discussed in relation to the relevant disaster protection plans.

For formation of tutors of 9-th to 12-th grade

Section 1: Protection in the event of disasters, emergencies and accidents.

- Ninth and Tenth grade.

Appendix to the section: Action Plane for Disasters, Emergencies and accidents.

Section 2: Fire and Emergency Safety. (Ninth and Tenth)

Section 3: Psychological support in disasters, emergencies, accidents and fi

For Kindergartens

- Lessons in Kindergarten are preformed based on instruction of the Ministry of Education.
- A training aid “Safe behavior in the event of disasters” is published for kindergartens.
- The handbook focuses on formation of safe behavior of children as a set of reactions and actions for survival in the environment in which they live. This behavior is subject to cultivation and is a part of the statutory process of teaching in kindergarten and school.
- The handbook is designed in response to the established regulatory documents in Bulgaria providing for the targeted work with children to develop behavior for survival in disasters.
- In Bulgarian schools and kindergartens, the training for behavior and action in case of earthquake is seen as an integral part of the training process for Risk prevention.

The Handbook (Kindergarten) contains:

Instruction of Ministry of Education and science;

- Disasters, Emergencies and Accidents Protection Act;
- Training program for children from kindergarten for responding to disasters, emergencies, accidents and fires.

“Hello school!”

In order to meet the requirements of the disaster Protection Act, a programming system “Hello School!” has been developed.

In the “Hello school!” programming system the topics for the formation of safe behavior in the event of disasters have been developed in methodological coherence with basic educational content.

The topics in the handbook can be used both for additional work within the system and independently, and thus to implement the regulatory provisions.

The educational content:

- Finding similarities and differences between pictures and images;
- Finding analogies in actions and activities;
- Moving in maze or according to a drawing;
- Working with conventional and information signs and symbols;
- Coloring pictures and/or parts there of containing the relevant thematic content.

3. Training materials used in schools and kindergarten in the interest of learning appropriate behavior during an earthquake.

Second grade: Cycle “Disaster Protection”

Topic: Schoolchildren behavior and action during an earthquake.

Objective of session: To introduce schoolchildren to the rules of behavior and action during an earthquake.

1. Rules of behavior and actions in case of earthquake.
  - What should a pupil do prior to the disaster?
  - When the first shock is felt.
  - What to do after the first shock is over?
  - After the earthquake is necessary.

2. Practical implementation of the rules of behavior.

Third grade – Cycle “Disaster Protection”

Topic: The disasters, emergencies and accidents in our life.

Objective of session: To make pupils familiar with disasters, emergencies and accidents.

Educative points:

1. Characteristic of disasters.
2. Characteristics of emergencies and accidents.

Fourth grade

Cycle: "Disaster Protection"

Topic: What should the pupil do upon the occurrence of various disasters emergencies and accidents?

Content and course of the session:

- Behavior and actions during an earthquake, emergency on site working with industrial toxic substances and increased radiation:

- Behavior and action during an earthquake:
  - When feeling first signs of the earthquake;
  - After the first shock;
  - After earthquake.

Fifth grade

Cycle: "Disaster Protection"

Topic: Earthquake – what pupils need to know in order to protect themselves?

Objective of session: To familiarize pupils with elemental earthquake disaster and the rules of behavior and action as it occurs.

Education points:

1. Earthquake – nature of the phenomenon.
2. Actions before the earthquake.
3. Behavior and actions during and earthquake.
4. Behavior and actions after the immediate danger.

Eighth grade

Cycle: "Disaster Protection"

Topic: Rules of behavior and actions of students in the event of disasters, emergencies and accidents/summarizing session/.

1. Earthquake

- Definition of earthquake;
- Physical explanation;
- Intensity and power of earthquakes;
- Rules of behavior after the first shock.

#### Disadvantaged people

In the field of training in risk prevention for disadvantaged people in Bulgaria by groups the following has been done:

- First group: Blind people and people with impaired vision capabilities.

The necessary has been done and this group is included in the training system in risk prevention at school level and in kindergarten. In the future it is necessary to pay more attention to training of trainers.

- Second group: Deaf and dumb.

The necessary has been done and this group is included in the training system in risk prevention at school level and in kindergartens. In the future it is necessary to pay more attention to training of the trainers too.

- Third group: People with disabilities who use wheelchairs.

The necessary has been done and this group is included in the training system in risk prevention at school level and in kindergarten.

Very little has been done to ensure the accessibility of this group.

Fourth group: People with mental disabilities.

They are included by name in the protection plans for disasters, emergencies and accidents.

#### Risk Prevention training of the population

Risk Prevention training of the population by:

- students: - by Ministry of Education and Science, Ministry of Interior and Training Centers;

- citizens: (workers, employers etc. ): - by mass media ( radio, TV, press ) and

#### Training Centers - Types of schools

- Public;
- Municipal;
- Private;
- With foreign participation;
- Foreign.



For instructional settings for orphans and children without parents care and for the special schools for children with physical and mental problems are obligatory too.

#### School program for emergency training

- During the school year – 5 hours;
- Twice a year (each term) a 5 hours practical school emergency plan training;
- Books on emergency problems settled in the school program;
- 5 instructional films and CDs for pupils from 1 to 4 classes.

#### Training of the trainers

- Demonstration and training for the implementation of the school emergency plan for headmasters and teachers;
- Periodical follow up courses for Risk Prevention for teachers;
- Special object of study in the Program of Shumen University and National Sports Academy in Sofia.

#### Improvement of the organization of the training process

- A joint project for optimization of the education programs and process by the Education Institute of the Ministry of Education and Science in cooperation with the Ministry of Interior, the Psychologist Association, the professors from Sofia University St. Kliment Ohridski etc.

Way ahead - For the future program is foreseen to be included lectures on:

- the risk terrorism;
- traffic safety;
- violence at home and in the street;
- drug habit;
- struggle against HIV;
- psychological training of the pupils.

### National School Competition - "Protection in cases of disasters and accidents"

- The target group – the pupils of 7 and 8 classes (13 – 15 years old);
- The competition stages:
  - School level;
  - Municipal Level;
  - District Level;
  - National Level.
- Every year more than 25000 pupils in the mentioned above ages took part in the different levels of the competition.

### The traditional Exhibition

"I saw the calamity in mine own..."

- The Exhibition has the same stages as the competition and the very last stage is the international exhibition.
- Till this moment in the exhibition took part representatives from Hungary, France, Tunisia, UK and USA.

### The training process in the regional level

- The regional structures of the Fireman (Ministry of Interior) are actively involved in the training process;
- On the territory of our country there are 28 education and information centers;
- In these centers a high qualified specialist trains the pupils on the specific issues preliminary coordinated with the headmasters.
- The Centers are built, equipped, and maintained by the Ministry of Interior.
- The practical trainings are the biggest part of the program.

### Emergency training for 4 – 7 age old children

- The obligatory training for 4 – 7 age old children in the kindergarten is introduced by the Ministry of Education and Science Instruction N 2.

- In process of development are coloring books, situation games, puzzles and cubes etc. as well as methodological handbooks for teachers.
- The training aids will be ready for distribution till the beginning of the new school year.
- The program is suitable with the mental, physical and emotional growth of the children.

#### Integration Project

- At present a project for integration between children with normal growth and injured children for adequate behavior in risk situations is worked out. That project is linked with the existing programs for adoption of the different people.

#### Emergency plans

- In every educational institution and kindergarten there are emergency plans for protection in cases of disasters, accidents and fires.
- These plans are developed with the actively cooperation of the regional structures for risk prevention.
- The plans are developed depends the specific conditions of each educational institution.
- The potential risk databases are taken from the municipal emergency plans for protection of the population.
- The data about the concede school or kindergarten (number of pupils, children, floors, built area etc.) are filled up by the headmaster.
- One copy of the plan is kept by Fireman specialist in the Municipality.
- During the development and/or update of the municipal plans forces and means for rendering the assistance are allocated priority for the schools and kindergarten.
- Depends on the changes occurred the plans are updated annually.

#### Summary

- Training in Bulgaria for "earthquake" risk prevention is performed in combination with training for other hazards on the basis of the requirements of the Disaster Protection Act and the Crisis Management Act.
- Training within the system of education on the issues of prevention of various types of risks specific to Bulgaria is performed on the basis of requirement and curricula established jointly by Ministry of Education and Science and the Ministry of Interior.

- The training in schools is performed from first to twelfth grade as follows:
  - As a separate school subject “Disaster Protection”.
  - By including specific topics and educative points in other school subjects.
- In the areas of the country where there is a real constant threat of earthquakes, Ministry of Interior has established Training and Methodological Centres, whose main purpose is to train teachers from schools in protection issues and to develop and disseminate teaching materials for the region specific hazards.
- Announcement and information of the population about the measures undertaken in crisis (including earthquake) is implemented in accordance with the Crisis Management Act.
- According to the Disaster Protection Act, Art. 52, Para 2, item 4 - children and people in disadvantaged position shall be taken care of, in the event that in a disaster situation this care cannot be taken by the people who usually take it.

LINDA PELLI, CIVIL ENGINEER , MSC , DEPUTY DIRECTOR OF E.P.P.O., DEPUTY DIRECTOR OF E.C.P.F.E.:  
GREEK’S EARTHQUAKE PROTECTION POLICY FOR PEOPLE WITH DISABILITIES

Earthquake Planning and Protection Organization (E.P.P.O.) was founded in 1983. E.P.P.O. is a Legal Entity of Public Law and operates under the supervision of the Hellenic Ministry of Infrastructure, Transportation and Networks.

From August 2011 I.T.S.A.K. was incorporated with E.P.P.O. The aim of E.P.P.O. is to process and plan the national policy for earthquake protection and earthquake mitigation –in accordance to governmental directions – as well as to coordinate the public and private resources for the implementation of this policy. The European Center on Prevention and Forecasting of Earthquakes (E.C.P.F.E.) was founded in 1987 and operates within the Framework of EUR-OPA. It belongs to the Network of 26 Specialized Centers of the Agreement and it is based in Athens , Greece . The Center has a close cooperation with Earthquake Planning and Protection Organization of Greece (E.P.P.O.). The objectives of E.C.P.F.E. are compatible with the thematic unions imposed by O.P.A. , concentrating on earthquake planning and protection. E.C.P.F.E. is also co-operating with other European Centers with relevant targets.

#### AXIS OF POLICY

- Protection of Monuments
- Forecasting and Prevention
- Education - Information
- Reduction of Vulnerability

- Protection Measures against Earthquakes for people with disabilities.- ECPFE also participates in a special Working Group formed by OPA for this purpose

“Persons with disabilities have the right to live independently and participate fully in all aspects of life on an equal basis with others in information, communications and other services, including electronic services and emergency services.”Source: Article 9.1, UN convention on the rights of persons with disabilities)

Level of Knowledge of People with Disabilities for Earthquakes and Protection Measures According to a SURVEY\* carried out by E.P.P.O, in the Framework of the Project POLITEIA, (March 2008): Specialized Questionnaires designed for this research, had been disseminated to 27 competent Organizations and after filling in, the results were elaborated by EPPO and it was assessed that it is necessary more knowledge to be transferred.

A text book addresses People with Disabilities as:

- Mobility impairments
- Cognitive impairments
- Speech Communication impairments
- Visual impairments/Blindness
- Hearing impairments/Deafness
- is divided into two parts:
- information about earthquakes
- protection measures for each type of disability

The textbook has been translated to Braille language by E.P.P.O, & the Organization:“Lighthouse of the Greek blinds”

Many earthquake drills took place, for each type of disability, in order to :

- act correctly and instinctively in case of a real earthquake
- identify gaps and challenges
- create a culture of earthquake behavior

- further earthquake-disaster reduction

#### Education:

- A questionnaire for an e-learning application in Greek and in English has been created, so as to educate and inform People with Disabilities .
- An e-learning platform was designed to host this educational material

#### Information –dissemination by E.P.P.O. /E.C.P.F.E.

- conduct seminars – workshops and training courses to students, teachers and educators in special schools
- are setting up specific leaflets for each disability

Biennium 2014-2015: - “Development of informative Material concerning Earthquake Protection Measures, for People with disabilities with the implementation of “Easy to Read” language “ and the augmentative alternative communication “ MAKATON” , coordinator ECPFE.

#### Earthquake specialists from EPPO and ECPFE.

#### Disability specialists sub-group:

- 2 Easy to Read specialists, a Psychologist & a Social Worker from the adult intellectual disability field
- 2 Makaton specialists, both Speech Language Therapists from the child & adult autism and intellectual disability fields
- 1 young adult with intellectual disability

Numerous leaflets and posters were drafted in Makaton language.

#### Primary goals for the target groups:

- to strengthen the ability to act spontaneously so as to protect oneself in case of an earthquake
- to increase the ability to identify environmental risks and to ask for their removal so that they are safer

Secondary goals for parents, caregivers and to empower with specific guidelines and useful, accessible material to use when informing and training their children or service users.

- to increase awareness in environmental risk removal
- to support understanding of instructions during practical disability service providers:
- exercises

ECRM Yerevan Project - ECPFE, participated as a partner in this activity and produced a Leaflet with guidelines to people with mobility impairments, (what to do before, during, after an Earthquake) as well as to their Personal Support Network.

Actions taking place now :

“Development of a tablet application concerning Earthquake Protection Measures, for People with disabilities with the implementation of “Easy to Read” language (Coordinator: ECPFE, Athens)”

TESEC, KIEV, UKRAINE – VIKTOR POYARKOV: EARTHQUAKE PREPAREDNESS OF SCHOOL STUDENTS AND POPULATION USING SCIENTIFIC KNOWLEDGE FOR PUBLIC MULTIMEDIA INFORMATION IN AREAS SHAKEN BY VRANCEA, ROMANIA, INTERMEDIATE SEISMOGENIC SOURCE (CASE STUDIES ON BUILDINGS IN MOLDOVA, UKRAINE AND BULGARIA)

The public perception of earthquake risk in Ukraine has been analysed. Seismic regions area of Ukraine is about 120 thousand of square kilometres, or about 20% of all territory. The earthquake intensity arranged from 6 to 9 points on the MSK-64 scale. About 10.9 millions people live in earthquake-prone areas or about 22% of the total population of the country, including in the areas of the 6-point seismic activity — 7.98 million (15.5%), 7-point — 2.16 million (4, 2%), 8-9-point — 0.79 million (1.5%).

Some important aspects of earthquake risk perception have been analysed. In light of the events in Japan, many Ukrainians in horror wondering whether there will be anything like this in our country. It is obvious that Ukraine is not a tsunami threat, but in terms of the probability of an earthquake, how it is high?

Messages from Japan, really disturbing, but the consequences of these events are impossible to predict. They combined both natural and man-made events. According to UNESCO on the globe are victims of earthquakes each year from 15 to 30 thousand people, material loss is more than U.S. \$ 400 million a year. Geography and the number of natural disasters tend to increase every year. Looking at the chart, we see clearly that the process of increasing the number of accidents for the period from 1975 to 2010.

The seismic areas of Ukraine are: Crimea, part of Odessa and Chernovtsy regions, Lvov, Ivano-Frankivsk and Ternopil region, located in the zone of the Carpathian earthquakes and Kirovohrad and Vinnitsa regions and part of the Donbas region.

*Impulses which force can occur in these regions?* Current data on seismic zones of varying intensity cover Crimea (6-9 points), Carpathian (7 points), Chernivtsi (6-7 points), Vinnitsa (6 points), Kirovograd (6 points), Lviv (6 points) Odessa (6-9 points), Ternopil (6 points), Khmelnytsky (6 points) of Ukraine. Most threatening in its consequences for Ukraine is the region Vrancea area, Crimea and Transcarpathian seismic zone. Strong earthquake last occurred here in 1927, 1940, 1977, 1986 and 1990.

*Can the Ukraine without the tragic consequences of the earthquake to survive the future?* The fact is that modern construction in seismic areas is complicated by the presence of geological hazards (floods, landslides, tornadoes, karsts, etc.). On the territory of Kievan Rus and the Ukraine over the past 900 years there have been over 30 major earthquakes. Strong earthquakes in the Crimea in 1927 caused damage of about 70% of all buildings in Yalta. In zone 8-point effects were five cities of the Crimea. Photo clearly illustrates some of the effects of this earthquake in Yalta and Sevastopol. In the area of Alushta observed tsunami wave heights from 0.3 m to 1 m Russian seismologists have mapped the tsunami on the Black Sea.

Carpathian earthquakes occurring in Vrancea Mountains are felt over a large area and extend for hundreds of kilometers from the epicentre. They occur at sharp bend the arc of the Eastern Carpathians and the general seismic situation in Moldova and western Ukraine. The strong influence of the Romanian earthquake in Ukraine recorded in the annals of history, references, and earthquakes in various catalogs and instrumental observations in 1091, 1170, 1230, 1443, 1446, 1471, 1701, 1790, 1802, 1838, 1893, 1908, 1912, 1927, 1940, 1977, 1986, and 1990. Earthquakes of this area have been the cause of significant destruction of buildings and structures in Moldova and Ukraine.

The strongest earthquakes of Vrancea area has been reported in the Ukraine with the intensity of predominantly 5-6. The exception to this trend was the earthquake in October 26, 1802, which was observed in Odessa and Chernovtsy with intensity up to 7 points. As for the capital: whether its residents feel subterranean impulses and persevere if Kiev facilities. Previously, it was customary to assume that the most vulnerable old buildings and what can we say about the new buildings, which have recently been built in Kiev shock? And it will stand Kiev dam? In high-rise buildings in Kiev, which cater to the perception of seismic forces 6 points, as well as in buildings with over 9 floors, fluctuates a lot, but it should do without damage.

Of course, this will lead to the manifestation of a sense of danger in people (especially on the upper floors of buildings), panic, ringing of bells in churches. In Kiev, did not observe an earthquake above 5 points, so with the Kiev dam will not be destroy because of that. Seismic scale determines the effects of the 5-point earthquake as follows: "In the room — there is a majority of people. Individuals — scared and ran out into the street. Hanging items — ranging, porcelain — ringing. Doors and windows — open. Animals — show concern. In buildings of adobe and rubble damage (pitting sealant hairline cracks in masonry joints). "But in Kiev these buildings cannot be found. General seismic zoning map of the territory of Ukraine, which are designed for all residential, public and industrial buildings — SRF 2004 "A", developed by the Institute of Geophysics of NAS of Ukraine and the Crimean council of experts to assess the seismic hazard and earthquake prediction, it is included in the Standards of Ukraine.



General seismic zoning map of the territory of Ukraine, which are designed for all residential, public and industrial buildings — SRF 2004 "A", developed by the Institute of Geophysics of NAS of Ukraine and the Crimean council of experts to assess the seismic hazard and earthquake prediction, it is included in the Standards of Ukraine.

The most exciting question discussed everywhere, will the Ukrainian nuclear power plants survived the earthquake without consequences? For Ukrainian nuclear power plants, including the Chernobyl nuclear power plant, the maximum possible intensity of earthquakes is less than 6 points on the MSK-64 scale.

From the point of view of science, is it possible to predict and somehow anticipate the approach of the earthquake? From the point of view of science, we cannot predict an earthquake. In America, in California, where the seismic active San Andreas Fault, the area is full of hundreds of seismic sensors, which record progress of the crust. There was no case to predictions were realized. Given the importance of the problem in Ukraine, the Interdepartmental Committee on Scientific and Technological Safety under the National Council of Security and Defence of the President of Ukraine in April 3, 2008 and May 19, 2009 considered the "Status of seismic security and development problems of earthquake engineering in Ukraine."

The Commission noted the growth of negative degradation technical state construction projects in Ukraine and increased wear and tear of fixed assets in different sectors of the economy and encouraged the Cabinet of Ministers of Ukraine to ensure the development of concepts and programs "Protecting people and buildings from seismic hazard", a list of dangerous objects and housing and public facilities, a National Engineering and seismic service of Ukraine in the Ministry of Regional Development and Construction of Ukraine, in accordance with its logistics and staffing.

We also give specific recommendations to the Ministry of Regional Development and Construction of Ukraine, the National Academy of Sciences of Ukraine, the Ministry of Ukraine of Emergencies and Affairs of Population Protection from the Consequences of the Chernobyl disaster, the Ministry of Education and Science of Ukraine and other state agencies that have to do with the problem of providing earthquake resistance of buildings and structures

Despite the fact that you cannot predict an earthquake, in seismically active regions, it will happen. In the design and construction of buildings should be responsible to comply with the requirements of the Standards for design in seismic areas, carry out advocacy of the population — how to behave during an earthquake and after the earthquake, but not limited measures of recovery.

#### *1. 4. Deliverable: Identification of good practices.*

As a result of the ECBR Seminar, the following good practices identification was possible in partner countries:

- from ECBR Romania:
  - the drafting and dissemination of website earthquake education booklets for school students;
  - the earthquake protection knowledge dissemination by public presentation and technical demonstrations using seismic didactic simulators, in ECBR, URBAN-INCERC, schools and universities;

- the promotion of pro-active learning and preparedness with school students, making them able to create small didactic simulators;
  - the technical knowledge dissemination by website concerning earthquakes, vulnerability and risks;
  - participation of ECBR staff in national drafting and dissemination of reliable mass-media earthquake education and disaster prevention video-clips;
  - ECBR has started some activities with Special Schools for students with disabilities in 2015, but we need to share experience with other EUR-OPA Centers, as Greece and Bulgaria. .
  - We made the contacts and preparatives to address firstly these 3 categories:
    - blind persons or with reduced capacity to see
    - deaf and mute
    - persons with moving handicaps, using wheelchairs.
- from ECRP Bulgaria:
- ensuring a very well structured system of curricula and drills for school students;
  - providing specific protection means for disabled children;
  - the concern and need of protection against the transboundary impacts of Vrancea, Romania earthquakes
- from ECPFE Greece:
- the long-term creation and wide dissemination of earthquake education booklets;
  - the special achievements and expertise in protection and training of disabled persons;
- from TESEC Ukraine:
- the concern about the possible Na-Tech disaster – earthquake and nuclear risks;
  - the concern and need of protection against the Vrancea source earthquakes transboundary earthquakes;
- from ECMNR R. Moldova:
- using scientific knowledge for public multimedia information about transboundary impacts of Vrancea, Romania, intermediate seismogenic source;
  - the promotion of the seismic risk prevention culture by implementing educational activities on seismic risk management in schools;

- dissemination of knowledge about the nature of earthquakes and methodical support for didactic staff training and development of skills for appropriate behavior in situations of seismic risk;

## 2. REPORT ON WORK PACKAGE 2

*Description:* Guidelines on the best approach to raise earthquake risk awareness

*Deliverable:* Proposal of educational tools for earthquake risk awareness

The final document WCDRR 2015: Sendai Framework for Disaster Risk Reduction 2015-2030. The framework of action for reducing the disaster risk has 4 priorities:

- Understanding the disaster risk
- Enhancing the governance of disaster risk, to manage it
- To invest in disaster risk reduction, for resilience
- A greater anticipated disaster preparedness for an efficient response and “To build back better”

WCDRR and ISDR provided a new framework 2015-2030. We need an all of society approach - engagement from all of society paying special attention to people disproportionately affected by disasters.

This is necessary for inclusive risk-informed decision making based on the open exchange and dissemination of disaggregated data, including sex, age and disability.

Concerning the seismic risk reduction, we have still to work:

- the earthquake scenarios are warning us about the potential of a damaging earthquake, since a wide series of different categories of buildings have been repeatedly overloaded, weakening structures;
- there is a need of qualified staff in local authorities offices, inspectors etc, to prevent lack of quality for new structures;
- the society development led to the appearance of new risk sources, as new structure elements, some industrial structures with inner risk sources;
- there is a need of earthquake education and training for officials, citizens, school students, to learn how to protect themselves under seismic motions, disaster awareness and public information projects or programmes

ECBR will enhance this long-term commitment, since there is need of a further knowledge transfer and dissemination about risk mitigation from specialists and authorities to the citizens and school students, for learning

how to protect and proceed to building rehabilitation. It is a challenge for teachers and professors in finding the best and correct answers to all questions that children are able to put.

The best approaches and good practices to raise earthquake risk awareness, as well as proposals of educational tools for earthquake risk awareness were identified in the Work package 1, with EUR-OPA Centers partners as follows:

- from ECBR Romania:
  - There is a need of new tools for education! (learning to live and to survive in seismic zones; behave in a rational and efficient way in case of seismic shaking; to not believe in rumors; prevent disasters and cooperate to recovery after such events)
  - There is a need of pro-active training of all generations to be able to live in a territory coping to all hazards! (the individual experience is very important!)
  - There is a need of sustained disaster awareness and public information!
  - There is a need of dissemination of research knowledge! - (with a feed-back from citizens, students, public authorities, mass-media).
  
- from ECRP Bulgaria:
  - The process of solving the problems of disadvantaged people in Bulgaria in disasters, emergencies and accidents it still at the initial phase. A lot has been done but it is not yet sufficient.
  - There is a need to address the trans-boundary impact of Vrancea earthquakes in Bulgaria and Romania;
  
- from ECPFE Greece:
  - The education and the conducting of earthquake drills at special schools must continue and must be obligatory as well
  - A culture of safety and earthquake resilience must be absorbed by individuals with difficulties, so as to strengthen the earthquake preparedness and response at all levels and encourage them to act independently.
  - It is of great importance that people with Disabilities must identify their needs themselves
  - The exchange of Knowledge and Experience between the Centers is very crucial.
  
- from TESEC Ukraine:
  - warning about degradation technical state construction projects in Ukraine and increased wear and tear of fixed assets in different sectors of the economy and the need to ensure the development of concepts and programs "Protecting people and buildings from seismic hazard"
  - creating a National Engineering and seismic service of Ukraine;

- from ECMNR R. Moldova:
  - There is a need of tools for adjustment of anti-risk education to pupil's personality.
  - There is a need of timely transparency and notification of all the persons concerned (pupils, parents, teachers, students, technical staff, etc.) concerning the seismic risks
  - The use of different strategies and technologies concerning the development of an appropriate behaviour to pupils, students, teachers, technical staff in the event of an earthquake is necessary.

#### ECBR PROPOSALS OF EDUCATIONAL TOOLS AND ADVANCED TECHNOLOGY FOR KNOWLEDGE TRANSFER FOR EARTHQUAKE RISK AWARENESS

ECBR will develop and use new specific tools and advanced technology for knowledge transfer and ECBR has proposals for an improved content of the website for education on seismic risk reduction, with euro-mediterranean coverage, as:

- Upgrading websites of ECBR and INFORISX to comply to present regulations, instructions and legislation in the field on risk mitigation in Romania
- Including best practices from seismic countries in the Euro-Mediterranean region
- Developing website versions accessible on tablet or smartphone
- Including special sections dedicated to people with disabilities.

On this background it is proposed the technical content framework of ECBR website, maintained jointly with information from Specialized Centers ECMNR of Chisinau, TESEC Kiev, ECRP Sofia, with some assistance from ECPFE Athens and BeSafeNet Cyprus, to address the trans-boundary impact of earthquakes in Romania, R. Moldova, Ukraine, Bulgaria.

#### TECHNICAL CONTENT FRAMEWORK OF AN EDUCATIONAL TOOL ON ECBR / INFORISX WEBSITE (HOSTED ON URBAN-INCERC WEBSITE) TO ADDRESS THE TRANSBOUNDARY IMPACT OF EARTHQUAKES IN ROMANIA, R. MOLDOVA, UKRAINE, BULGARIA

The target countries will be Romania, R. Moldova, Ukraine and Bulgaria, as being at risk because of transboundary impacts of Vrancea earthquakes from Romania. Other countries and specialized EUR-OPA centers may benefit of information, experience and examples.

The IT format will be for desktop access and for smartphone access. Sections for persons with disabilities / special needs will be developed.

There is a wide spectrum of target audiences who need to be trained for earthquake disaster. The audiences can be grouped under the following three levels: community, professionals and authorities-policy-makers.

1- Necessity and purpose of education and training for earthquake preparedness for disaster risk reduction:

- Protection and public earthquake preparedness, as components of anticipated mitigation of earthquake disasters;
- Institutions and centers for disaster preparedness.
- Links to websites of Romania, R. Moldova, Ukraine, Bulgaria – in own national language

## 2- Origin and action of earthquakes in Romania, R. Moldova, Ukraine, Bulgaria

- Vrancea earthquakes of Romania
- Local crustal earthquakes in R. Moldova, Ukraine, Bulgaria
- Seismic zonation maps and their explanation

## 3- Causes of earthquakes. Scales for the estimation of earthquake size.

- Magnitude, intensity, focus, hypocenter, epicenter, seismic waves

## 4- Seismicity of the territory of Romania and the effects of previous earthquakes.

- Seismicity of the territory of Romania;
- Action of earthquake on environment, buildings, localities and population;
- Concepts for earthquake protection of buildings;
- Prediction of earthquakes.
- Links to websites for seismicity of R. Moldova, Ukraine, Bulgaria in own national language

## 5- Types of buildings, materials and constructive systems currently used in Romania:

- Wood, stone, masonry, concrete, steel
- Bearing / resistant structures with bearing walls;
- Reinforced concrete frame structures;
- Composite structures, central core buildings;
- Vertical elements for closing and partition of buildings.
- Links to websites of R. Moldova, Ukraine, Bulgaria in own national language

## 6 - Vulnerability of buildings. Examples of earthquake damage and ways to reduce losses

## 7- Reaction of population to the Vrancea earthquakes of 1977, 1986, 1990 and later.

- Examples and lessons from Romania, R. Moldova, Ukraine, Bulgaria.
- Links to websites of R. Moldova, Ukraine, Bulgaria in own national language

#### 8- Factors influencing the reaction and behaviour of population in case of earthquake:

- Causal factors- oscillations;
- Physiological and psychological factors;
- Social factors (collectivity, rumours, mass-media);
- Factors depending on constructive, architectural and urbanistic characteristics of buildings and localities;
- Factors depending on time and season of earthquake occurrence.
- Succession and correlation of seismic effects and of human sensations and reactions to earthquake.
- Possible typical sensations and behaviour of humans in earthquakes, especially in high-rise buildings under long-period Vrancea earthquake motions;
- Links to websites of R. Moldova, Ukraine, Bulgaria in own national language

#### 9- Best practice rules for earthquake protection of communities and persons in buildings and behaviour of occupants during earthquake, based on experience of Romania, R. Moldova, Ukraine, Bulgaria.

- Links to websites of R. Moldova, Ukraine, Bulgaria in own national language

#### 10. Practical recommendations regarding the earthquake protection in residential and adjacent areas;

- What should you do before an earthquake – preparedness actions;
- What should you do during a strong earthquake;
- What should you do after a strong earthquake.
- Commented rules of safety, self control, survival and behaviour, for seismic events during day and night, cold or warm season etc.
- Rules of safety inside apartments or houses (securing furniture and appliances) and outside (securing non-structural members, chimneys, ornaments etc.).
- Links to websites of R. Moldova, Ukraine, Bulgaria in own national language
- Links to other EUR-OPA Specialized Centers.

Examples of posters with simple rules:

Recommend rules:

- . "In case of earthquake, keep calm, stay where you are, do not use the stairways or elevators" ;

. "In case of earthquake, do not use the stairway" ;

. "In case of earthquake, keep away from buildings" .

Pictures must show local damage in earthquakes.

Examples of posters with prevention rules:

"We are living in a seismic zone. For your life safety:

- Do not proceed to unauthorized repair works, observe the authorities, mayor's office and specialists' advice;
- Do not build new houses, until the plans and erection permits are approved by the mayor's office;
- Do not live into the damaged houses if there is a life danger warning posted on by the mayor's office".

The poster must combine educational and legal issues.

11. Practical recommendations regarding the earthquake protection in schools and adjacent areas.

- Links to websites of R. Moldova, Ukraine, Bulgaria in own national language

12. Practical recommendations regarding the earthquake protection in public institutions, means of transportation, agglomerated places and adjacent areas;

Links to websites of R. Moldova, Ukraine, Bulgaria in own national language



## ECRP

In accordance with the decision adopted during the meeting of directors of the centers of European and Mediterranean Major Hazards Agreement (EUR-OPA) of the Council of Europe that took place in 2014 in Strasbourg (France), European Centre for Risk Prevention (ECRP), Sofia, Bulgaria participates how support partner (without budget) in a project coordinated by European Centre for Building Rehabilitation (ECBR), Bucharest, Romania.

In Bulgaria, the different institutions seeking to conduct training on the prevention of risks to the school level : Ministry of Education, Ministry of the Interior, Ministry of Environment and Water, Ministry of Defense, Bulgarian Red Cross, Ministry of Building and Territory and many other organizations.

The following activities have been performed in 2015 by the European Centre for Risk Prevention (ECRP), Sofia within the implementation of the project "Public Awareness and Education Tools for Disaster Risk Reduction and Preparedness in Earthquake Crisis Situation, including people with disabilities"(Coordinator – ECRM, Bucharest):

- Development of materials about "Risk sciences: Training at school level";
- Participation at Seminar in Bucharest organize by Coordinator – ECBR (Bucharest);
- Presentation: Earthquake safety program for schools. Good Practices from Bulgaria: Specialized local centers for risk prevention training.

All activities planned for 2015 under this project (Work Package) have been performed.