

URBAN
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INCERC

EUR  **OPA**
EUR-OPA MAJOR HAZARDS AGREEMENT
ACCORD EUR-OPA RISQUES MAJEURS



National Institute for Research and Development in Construction, Urban Planning and Sustainable Spatial Development “URBAN-INCERC”, Bucharest, Romania

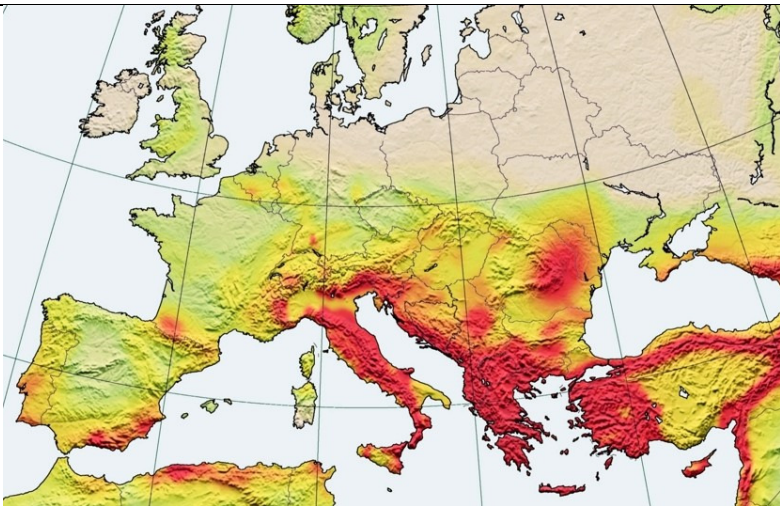
ECBR – EUROPEAN CENTER FOR BUILDINGS REHABILITATION

REPORT ON ECBR ACTIVITIES IN 2018. ECBR PROJECT IN 2019

Dr. Eng. Emil - Sever Georgescu
DIRECTOR OF ECBR,

Zagreb, Croatia, 6-7 November 2018

HALF OF EUROPE, AND ESPECIALLY SOUTH-EAST EUROPE IS SEISMIC



ESC - SESAME Project, 2003

ALL ROMANIA IS SEISMIC

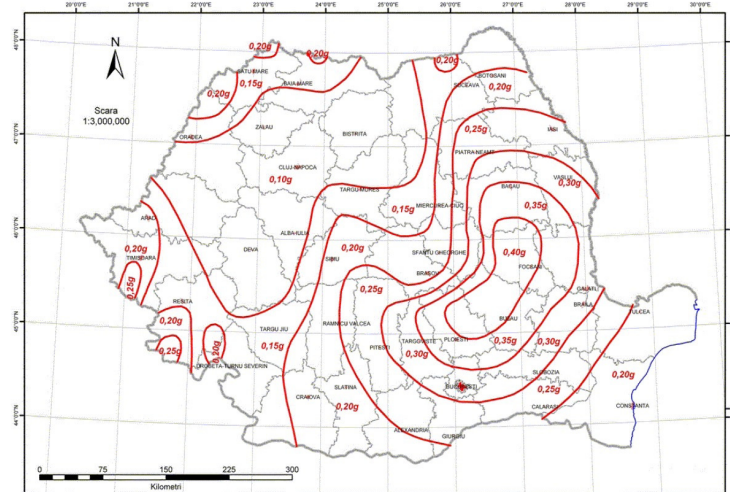
**BUCHAREST CITY IS SEISMIC-
EARTHQUAKES OF 1802, 1838, 1940, 1977**

**Citizens must receive
training for earthquake
safety**

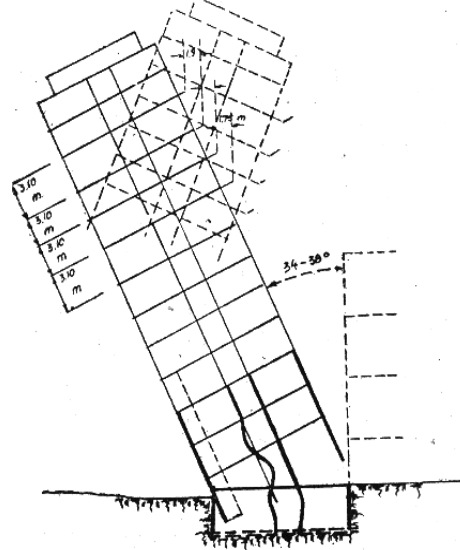
**ECBR is in the frontline of
EUR-OPA to promote ISDR
UNO-DRR Sendai Framework**

**VRANCEA DEEP SEISMIC
SOURCE CAUSED
TRANSBOUNDARY DISASTERS
IN R. MOLDOVA, UKRAINE AND
BULGARIA**

**Romania Seismic Zoning Map
Code P100-1/2013 for Seismic Design – IMR 225 years.
Bucharest City – design acceleration 0.3 g**



**BUCHAREST CITY, 1940
COLLAPSE OF CARLTON BLOCK,
TALLEST R.C. STRUCTURE**



- In Bucharest 140 killed from the 226 occupants of Carlton block
- other 300 injured in the city

**NOVEMBER 10, 1940 VRANCEA,
Mw = 7.7 ROMANIA
EARTHQUAKE DISASTER**

- Focal depth of 150-160 km
- I_0 10 MCS (Mercalli-Cancani-Sieberg Scale);
- 593 killed and 1,271 injured in all the country
- The damage was concentrated in the towns and villages of Carpathian Mountains curvature area
- High damage in Moldova

**After 1940 - earthquake design codes initiated
COMPULSORY SEISMIC CODE 1963; 1970**

Strengthening of no-code high-rise buildings in Bucharest neglected

BUCHAREST CITY, 1977



◆ Bucharest - 70% of the total loss

◆ Collapse of 25 buildings that were damaged in 1940 - without strengthening until 1977

◆ Partial collapse of only 3 code-buildings

◆ SEISMIC STRENGTHENING WAS LIMITED, VULNERABILITY EXIST

MARCH, 4, 1977 VRANCEA, Mw = 7.5, ROMANIA EARTHQUAKE DISASTER

March, 4, 1977 earthquake

◆ Mw = 7.5, I max = 8 MSK

◆ Focal depth - 109 km

◆ 2 billion US Dollars loss

◆ Casualties :

▪ 1,578 deaths (90% in Bucharest)

▪ 11,300 injured (68% in Bucharest)

Damage to buildings:

◆ 32,900 destroyed housing units, 35,000 homeless families

◆ 763 collapsed or destroyed commercial/industrial units

◆ 47 collapsed or destroyed hospitals

◆ 257 destroyed educational buildings, 181 collapsed or destroyed cultural buildings

Cladire expertizata tehnic
încadrata
în clasa I risc seismic

BUCHAREST RED DOT BUILDINGS
WE HAVE MORE THAN 350 HIGH-RISE
PRE-1940 BUILDINGS
FIRST CLASS OF SEISMIC RISK

....
ALL NEED SEISMIC REHABILITATION

LEGAL FRAMEWORK OF ROMANIA:

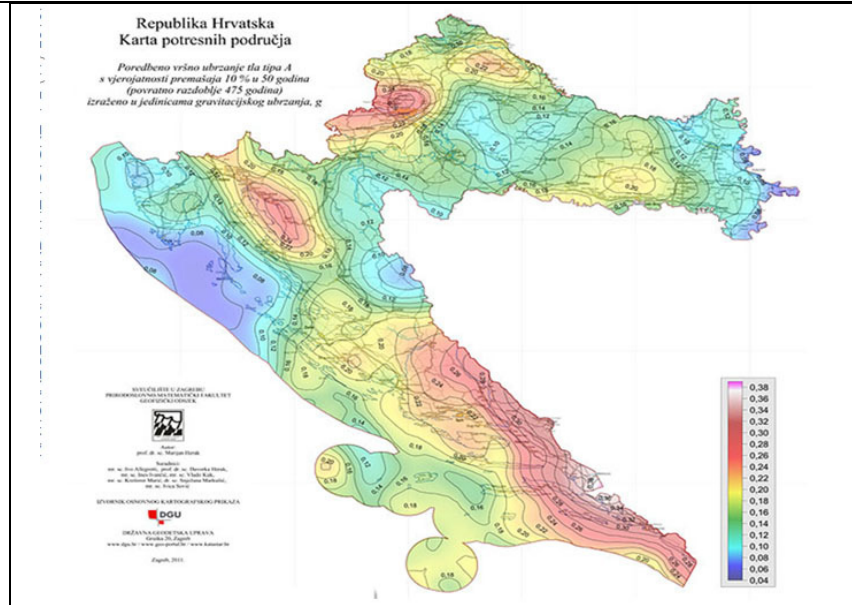
- ◆ **LAW ON SEISMIC RISK REDUCTION OF EXISTING BUILDINGS – OG 20/1994**
- ◆ **SEISMIC DESIGN CODE P100-1/2013**
- ◆ **SEISMIC ASSESSMENT CODE P100-3/2008**
- ◆ **GOVERNMENT BUDGET - REHABILITATION**
 - ◆ **MDRAP NATIONAL STRATEGY AND PLANS FOR SEISMIC RISK REDUCTION WITH INCENTIVES ON 20 YRS**
- ◆ **SOME CITIZENS DO NOT COOPERATE !!!**



ECBR TASK: CITIZENS MUST BE EDUCATED AND TRAINED TO COOPERATE IN BUILDINGS REHABILITATION AND EARTHQUAKE SAFETY

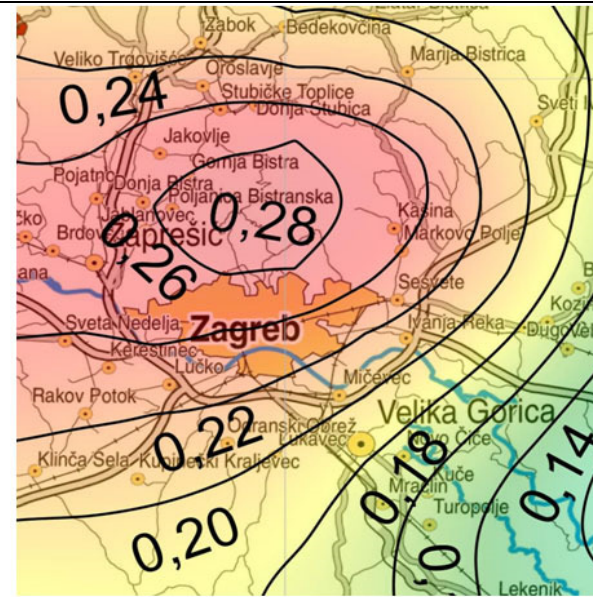
ROMANIA AND CROATIA, BUCHAREST AND ZAGREB HAVE HIGH SEISMIC HAZARD AND RISK, SIMILAR TASKS IN EUR-OPA

CROATIA IS SEISMIC



Croatian Territorial Earthquake Map for the return period of 475 years. Pavle Kalinić, Boris Guberina, 2016

ZAGREB CITY IS SEISMIC



The administrative area of the City of Zagreb - areas of ground acceleration which varies from 0.20g type A to 0,28g. Pavle Kalinić, Boris Guberina, 2016

The city of Zagreb - destroyed by earthquake several times in history, in 1830, and in September and October 1838.

Zagreb - The earthquake of November 9, 1880, M 6.3 and estimated intensity of Io VIII–IX on the EMS scale. More than 500 houses, large buildings, churches, and castles very damaged.

ECBR PROJECT 2018-2019

SEISMIC RISK PREPAREDNESS AND DISASTER RISK REDUCTION – DRR TRAINING FOR VULNERABLE GROUPS OF POPULATIONS, SCHOOL STUDENTS AND VOLUNTEERS IN NEIGHBORHOODS IN ROMANIA

Coordinator Centre: ECBR, Bucharest, Romania

Partner 1: ECRP Sofia, Bulgaria - providing expertise and educational materials for earthquake preparedness to ECBR

Partner 2: ECMNR – Chisinau, R. of Moldova - providing expertise and educational materials for earthquake preparedness to ECBR

2018

- Development of specific knowledge transfer / training materials for neighborhoods with traditional, old and vulnerable low-rise buildings, for citizens and volunteers - in Romanian language;
- Knowledge transfer by training seminars for citizens / volunteers/ students using courses, printed materials and didactic seismic simulators

Activities

- **Organization of training seminar for citizens / volunteers**
 - Date: June 2018
 - Duration: 2 days
 - Participants: 40 Romanian citizens / volunteers
- **Organization of short time free-field seminars directly with citizens in two neighborhoods - traditional, old and vulnerable low-rise buildings**
 - Date: 2018
 - Duration: 2 hours in each of two neighborhoods places –
 - Participants: about 20-30 citizens in each vulnerable group

Results

- Provide practical knowledge and create positive DRR perception for citizens.
- Direct transfer of earthquake preparedness knowledge to the community using verbal explanations, didactic mini-simulators and leaflets for citizens in neighborhoods with traditional, old and vulnerable low-rise buildings
- Learning and understanding reason, means and ways of achieving earthquake preparedness knowledge, good practice and skills for persons, groups, family and community members
- Receive materials and have exchange of experience on earthquake disaster risk reduction in neighborhoods at risk within EUR-OPA centers

28-29 June 2018 - ECBR TRAINING SEMINAR at URBAN-INCERC using Japanese didactic seismic simulators



28-29 June 2018 - ECBR TRAINING SEMINAR LECTURES



CADRUL INTERNATIONAL ISDR – ONU “SENDAI FRAMEWORK”

CS I / Conf. dr. arh. habil. urb. Vasile MEITA
DIRECTOR GENERAL

Dr. ing. Emil-Sever GEORGESCU

DIRECTOR STIINTIFIC

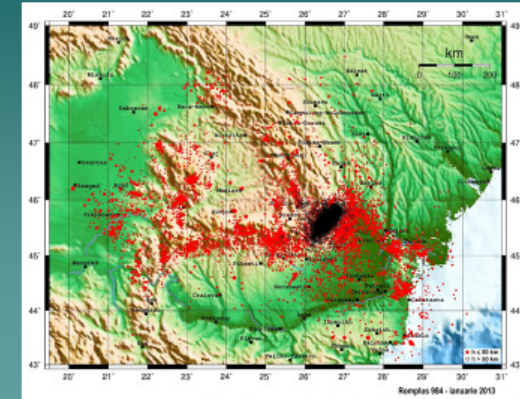
DIRECTOR ECBR – Centrul European pentru Reabilitarea Cladirilor
din cadrul Acordului EUR-OPA Hazarduri Majore

Cercetator Stiintific I,

RETEAUA NATIONALADE MONITORIZARE SI PROTECTIE SEISMICA A
PATRIMONIULUI CONSTRUIT
INCERC URBAN-INCERC

SEISMICITATE, HAZARD ȘI RISC SEISMIC ÎN ROMÂNIA.

Unde s-au produs cutremure ?
Cutremurele din Romania 1984...2013
(Catalog ROMPLUS, INFP)



Va place sa
fugiti la
seism pe
scari ?

- ◆ 4 martie 1977
- ◆ Str. Dr. Brandza,
- ◆ Bucuresți



VULNERABILITATEA SI COMPORTAREA OMULUI LA SEISME

Dr. ing. Emil-Sever GEORGESCU

DIRECTOR STIINTIFIC

DIRECTOR ECBR – Centrul European pentru
Reabilitarea Cladirilor

din cadrul Acordului EUR-OPA Hazarduri Majore

Cercetator Stiintific I,

RETEAUA NATIONALADE MONITORIZARE SI
PROTECTIE SEISMICA
A PATRIMONIULUI CONSTRUIT

2019

- Development of specific knowledge transfer / training materials for neighborhoods with old and vulnerable high-rise buildings erected before 1940 and/or 1977 earthquake disasters, for citizens and volunteers - in Romanian language,
- Knowledge transfer by training seminars for citizens / volunteers/students using courses, printed materials and didactic seismic simulators;
- Confirming good practices during a Final Workshop with associated centers

Organization of short time free-field seminars directly with citizens in two neighborhoods – places with old and vulnerable high-rise buildings erected before 1940 and/or 1977 earthquake disasters

- Date: May-June 2019, Duration: 2 hours
- Venue: near buildings, in each of two neighborhoods places in Sector 2 of Bucharest
- Participants: about 20-30 citizens in each vulnerable group

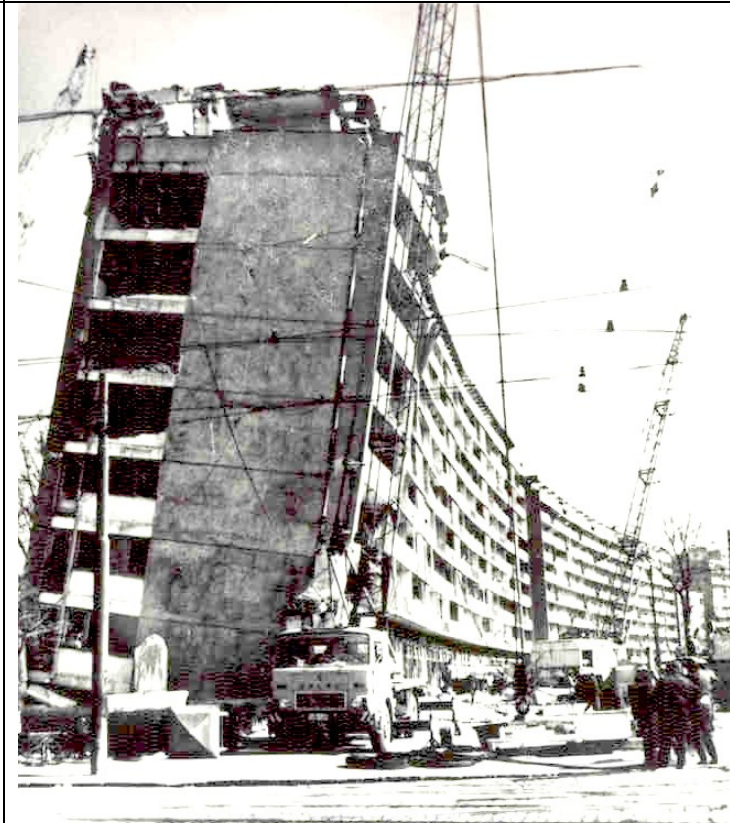
Organization of training seminar for citizens / volunteers to become trainers for other citizens

- Date: May-June 2019, Duration: 2 days
- Venue: ECBR Room in URBAN-INCERC
- Participants: 20 Romanian students / citizens / volunteers

2019 - Training of citizens in high-rise buildings at risk:

- Pre - 1940 blocks
- Pre - 1963...1977 blocks

Bloc 30 on Stefan cel Mare Street, soft-story, partial collapse in 1977



ECBR TASK: CITIZENS MUST BE EDUCATED AND TRAINED FOR BUILDINGS REHABILITATION AND EARTHQUAKE SAFETY

Organization of a Project Workshop with associated centers

- Date: October 2019, Duration: 2 days
- Venue: ECBR Room in URBAN-INCERC
- Participants: 3 Directors of EUR-OPA associated centers of Bulgaria, Greece, and Republic of Moldova

Expected results

- Direct transfer of earthquake preparedness knowledge to the community using verbal explanations, didactic mini-simulators and leaflets for citizens in neighborhoods with old and vulnerable high-rise buildings erected before 1940 and/or 1977 earthquake disasters
- Learning and understanding reason, means and ways of achieving earthquake preparedness knowledge, good practice and skills for persons, groups, family and community members
- Increase resilience and pro-active behaviour of citizens in risky neighborhoods, with assistance of volunteers.
- Confirmation of good practices on earthquake disaster risk reduction in neighborhoods at risk within EUR-OPA centers by an ECBR Workshop in Romania
- Fostering official duties of Civil Protection (IGSU) and attracting some NGO's to be partners of IGSU and ECBR in multiplying the risk reduction effect in neighborhoods.

Thank you very much !