

REDUCTION OF THE ECONOMIC-FINANCIAL EXPOSURE OF THE STATE AND PROTECTION OF HUMAN LIVES

MODELS FOR THE PREVENTION AND MITIGATION OF DAMAGES TO PEOPLE AND PROPERTIES THROUGH AN INSURANCE COVERAGE

PRESENTATION

NAME EXPERT: Emil-Sever GEORGESCU

REFERENCE INSTITUTE: NIRD URBAN-INCERC, Bucharest, Romania

The National INSTITUTE URBAN-INCERC

- **Emil-Sever GEORGESCU**
 - ▣ Civil Engineer (1972), PhD (1999)
 - ▣ Senior Researcher, Laboratory for Seismic Risk Assessment and Actions in Constructions (former head), in INCERC Bucharest
 - ▣ Scientific Director (INCERC, since 2008) Scientific Director for Constructions (URBAN-INCERC, since 2010)
- **THE NATIONAL INSTITUTE FOR RESEARCH AND DEVELOPMENT IN BUILDING, URBANISM AND SUSTAINABLE TERRITORIAL DEVELOPMENT** (since 2009)
- Resulted after merging of several institutes and centers (2009):
 - ▣ INCERC – The Building Research Institute (est. 1950), URBANPROIECT – The Institute for Urban Planning Studies (est. 1960), and CDCAS – The Center for Documenting in Constructions, Architecture and Urban Planning, and since 2010 – absorption of NCSRR - JICA Project
- Branches in 3 major cities: Iasi, Cluj-Napoca, Timisoara

Romania: experience and codes for seismic hazard, vulnerability and risk

Subcrustal (intermediate depth) earthquakes in the seismogenic zone, called Vrancea, at curvature of Carpathian Mts., in S-E of Romania dominate the seismicity

- ▣ depths between 60...80 and 160...200 / 220 km
- ▣ Earthquakes with M over 7 Richter affect with high intensities ca. 50% of the land

Crustal – shallow earthquakes in West, North, Central areas and S-E (Black Sea) – local damage effects, but very strong

- ▣ In areas exposed at Vrancea earthquakes there is some 35% of Romania's population, over 66% of urban population;
- ▣ Great earthquakes – at some 30 - 40 years average interval .
- ▣ Accelerographic data on Vrancea earthquakes of 1977, 1986 and 1990 earthquakes by INCERC National Seismic Network for Buildings.
- ▣ P100 / 1978...1981 Code - addressed only new buildings
- ▣ P100 / 1992 Code – included existing buildings assessment
 - ▣ Methodology of investigation of buildings before / after earthquakes (1999) revised ME 003 /2007
- ▣ P100-1/2006 replaced by P100-1/2013
- ▣ P100-3/2008 for evaluation and strengthening of existing buildings

National Programs for Seismic Risk Mitigation in Romania

- Law - Ordinance no. 20/1994 for the Seismic Risk Reduction
 - Bucharest - total 2416 residential buildings listed at risk
 - Strengthened – 38
 - Very low speed of owners application for receiving loans
- Following World Bank advice, in 2002, the Romanian Government started to draft a law project for a compulsory insurance at low-cost , enforced – July 2010, for earthquakes, landslides and floods
- Two coverage levels, two house types:
 - A. 20 Euro – 20.000 Euro coverage / processed materials
 - B. 10 Euro – 10.000 Euro coverage / raw materials
- No. of insurable residences – 8.5 Millions
- No of voluntary insurance policies – 4 Millions
- No. of compulsory insurance policies – 878.344 at 31.01.2014

Importance and validity of CGIAM Project

- CGIAM Project is important because:
 - it makes reference to the reduction of losses for all Italia, as a system
 - it is a response to the past disaster impacts (Irpinia, 1980's) and to recent disasters (San Giuliano, 2002, L'Aquila 2009, Emilia, 2012)
 - it is based on local development of science and practice, with advanced approaches
 - there is a logical approach, starting with seismic hazard, vulnerability and risk analysis
 - It is intended to be used with a insurance coverage
- There are overall premises of validity, since:
 - the seismological models are based on rich local data
 - vulnerability is best studied in Italy vs. Europe
 - the model will consider advanced features of buildings response

Originality and Scientific value

- The project proposes a mixture of approaches from different disciplines, starting from earth sciences to civil engineering, building monitoring and loss evaluation to provide insurance schemes as result.
- It is challenging also the formulation of the model for the multi-disciplinary characterization of the territory with respect to the different types of natural risk, with particular regard to earthquake risk, and the ideas about building response and monitoring
- It leads to theoretical and experimental studies on the use of new materials and/or techniques for the adaptation/seismic buildings improvement
- It would require a very complex algorithm and calibration, but the universities and institutes have recent research to use on this respect

Innovative features

- I appreciate the following aspects:
- The design of “*low-cost technical-structural interventions*”, aimed at the mitigation of building collapse risk – high responsibility and time consuming
- Construction of a continuous "low cost" buildings monitoring system, working in remote – very challenging
- Introduction of tax relief criteria of the costs incurred by the property owners for the improvement interventions on the building
- Validation of procedures and models defined within the project will be carried on buildings of strategic importance
- It will be a good support for the Strategy for the Mitigation of Natural Risks, for public and private stakeholders of Italy
- Seismological approaches will serve the engineering and socio-economic and insurance approaches
- Insurance may reduce the public budget burden in case of strong earthquakes