GLOBAL BLUEPRINTS FOR CHANGE

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The Global Blueprints for Change contain guidance for working together to improve the capability to identify indicators of physical, social, enterprise, and environmental vulnerabilities throughout the world and to select and implement realistic solutions to reduce them towards acceptable levels.

Theme A: LIVING WITH NATURAL AND TECHNOLOGICAL HAZARDS
Topic A.11: Reducing Risk to Cultural Heritage

"Seismic Risk Of Building Stock in Historical Centres of Modern Cities"

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Seismic Risk Of Building Stock In Historical Centres Of Modern Cities

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Abstract: This Blueprint for Change will provide guidance to communities throughout the world that are seeking cost-effective ways to preserve and protect historical buildings, antiquities, monuments, and other national treasures from the potential impacts of natural and technological disasters.

Background

The importance of the city centre in urban life is very significant. It represents the heart of the city that defines life in its whole of the town and shows the ways of city development.

The multifunctional nature of the city centre creates various difficulties during the research process on the behaviour of its building stock. It is complicated by the existing historical monuments, as there is a great misbalance between modern life demands and existing old infrastructure with its vulnerable, obsolete buildings.

These kinds of buildings are collapse risks. They are very dangerous for the inhabitants in seismic areas such as the south Caucasus, especially, for example, in the historical part of Tbilisi, the capital of Georgia as well as a significant geo-political centre in the Caucasus.

For these cases it is necessary to use opportunities provided by reconstructions taking into account the characteristics of the seismic hazard of the territory.

The success of the reconstruction of the buildings sited in the seismic zones depends on the definition of the following points and the relationship between them:

1. Risk of building destruction caused by earthquakes;
2. Risk of secondary activities of earthquakes: fire, landslides, floods, stone fall, snowfall, etc.;
3. Analysis of the recent earthquakes and learn from them in order to reduce the vulnerability of the building stock;
4. Mechanisms that can implement successful protection of building stocks against earthquakes are: governmental policy, legislation, education, insurance and other faces of social - economical aspects
5. Seismic risk measurements in order to define buildings' vulnerability;
6. Reconstruction as an opportunity for minimizing of seismic risk.

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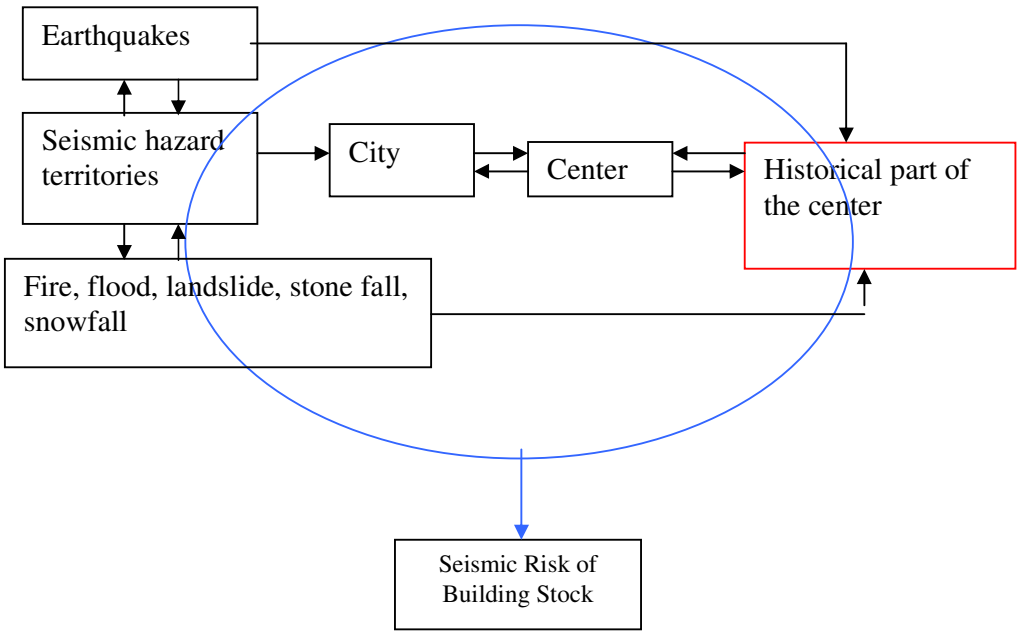
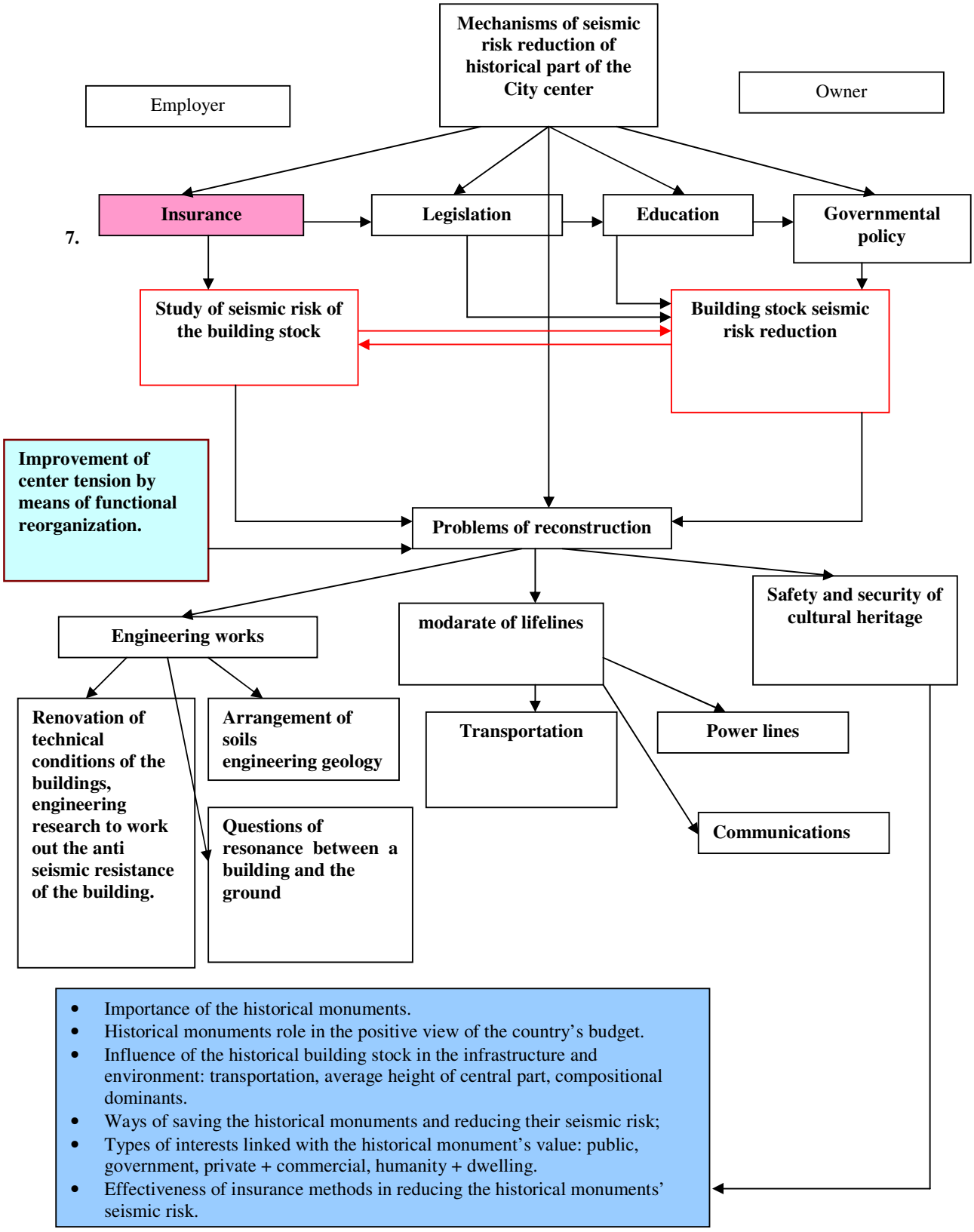
[1] The Blueprint was prepared by a Working Group representing the organizations: "Engineering Ideas" and "Center of Applied Geophysics, Engineering, Seismology and Aseismic Structures," Republic of Kazakhstan

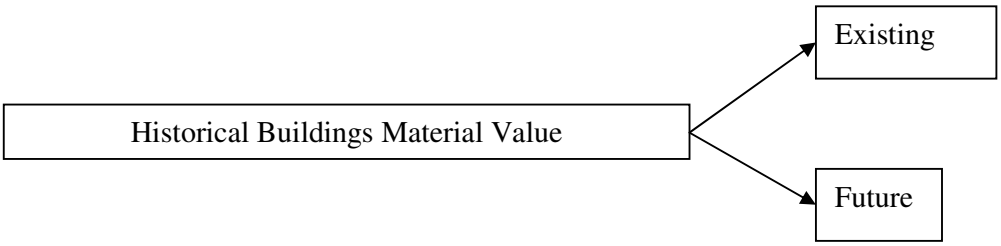

Earthquakes
Seismic hazard territories
City
Center
Historical part of the center
Fire, flood, landslide, stone fall, snowfall
Seismic Risk of Building Stock

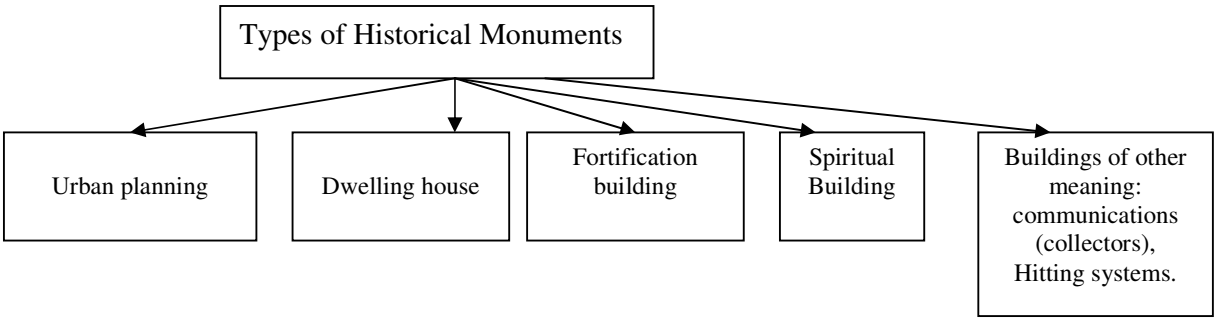
7.


Mechanisms of seismic risk reduction of historical part of the City center
Employer
Owner
Insurance
Legislation
Education
Governmental policy
Study of seismic risk of the building stock
Building stock seismic risk reduction
Improvement of center tension by means of functional reorganization.
Problems of reconstruction
Engineering works
modarate of lifelines
Safety and security of cultural heritage
Renovation of technical conditions of the buildings, engineering research to work out the anti seismic resistance of the building.
Arrangement of soils engineering geology
Questions of resonance between a building and the ground
Transportation
Power lines
Communications
Importance of the historical monuments.
Historical monuments role in the positive view of the country's budget.
Influence of the historical building stock in the infrastructure and environment: transportation, average height of central part, compositional dominants.
Ways of saving the historical monuments and reducing their seismic risk;
Types of interests linked with the historical monument's value: public, government, private + commercial, humanity + dwelling.
Effectiveness of insurance methods in reducing the historical monuments' seismic risk.

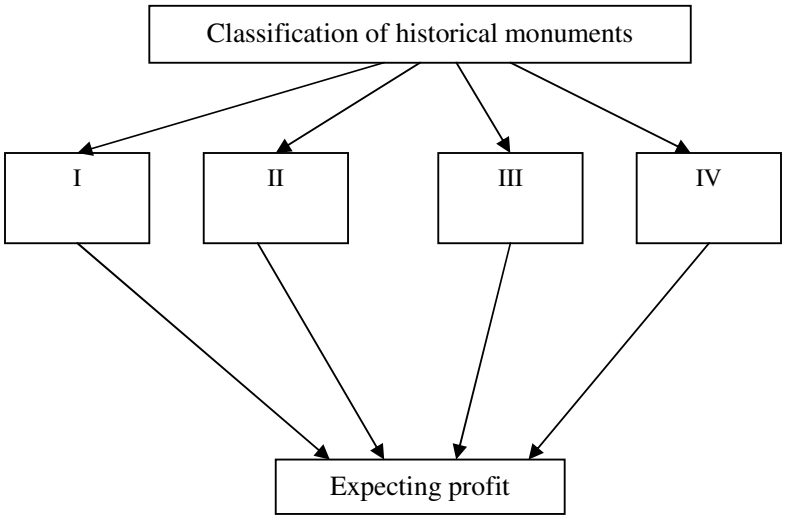
HISTORICAL MONUMENTS' INFLUENCE ON THE BUILDING STOCK SEISMIC RISK AND ITS REGULATION BY THE WAY OF INSURANCE

Research of the ratios of relations between historical monuments and insurance



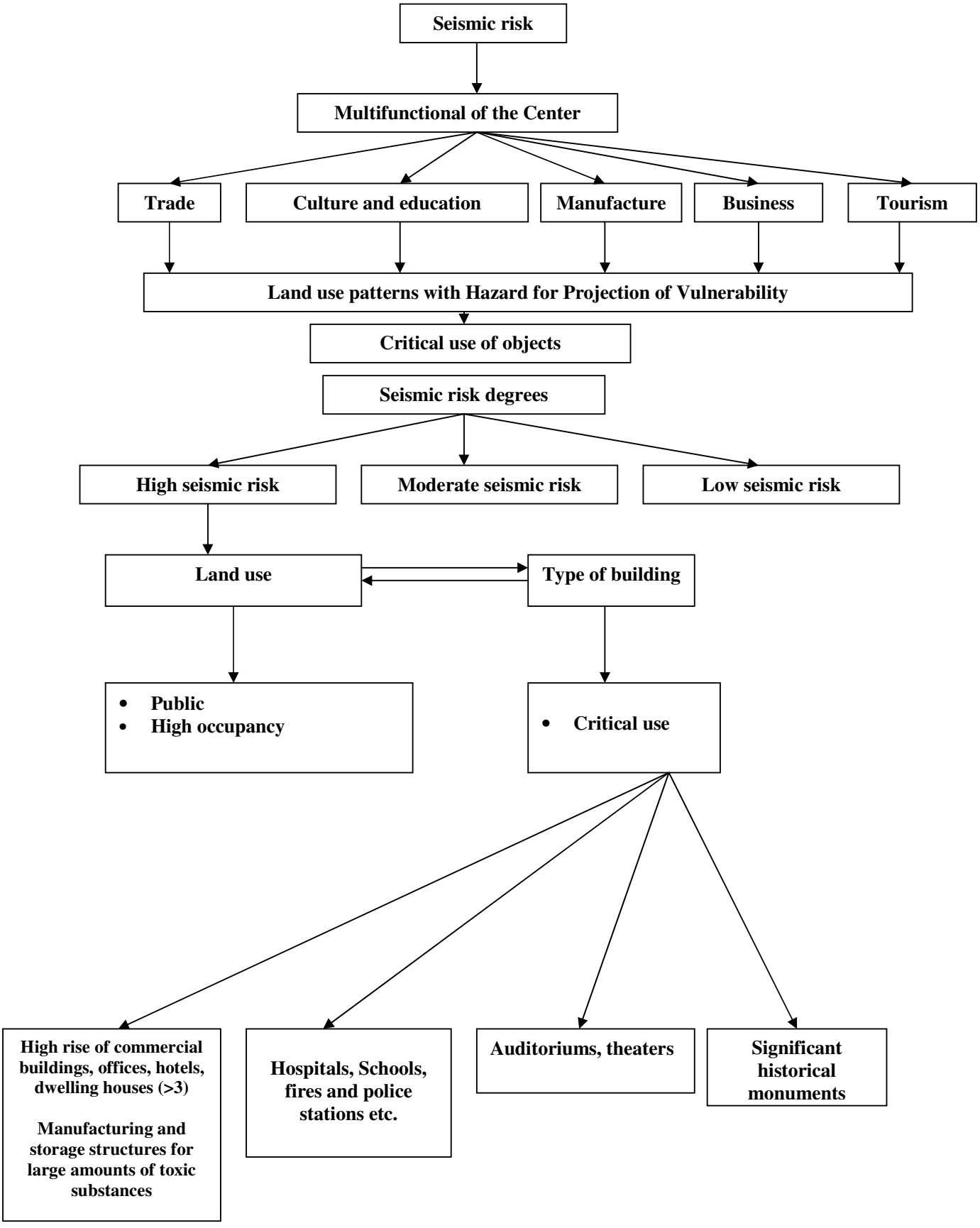


Study of relationship between the material value of historical monuments and its importance



Conclusions

The evaluation of the material value of the historical monuments permits to define the nature of relations and cooperation between insurance companies, government and private organizations or individuals, so that special recommendations for these cases can be prepared based on this study.


Seismic risk
Multifunctional of the Center
Trade
Culture and education
Manufacture
Business
Tourism
Land use patterns with Hazard for Projection of Vulnerability
Critical use of objects
Seismic risk degrees
High seismic risk
Moderate seismic risk
Low seismic risk
Land use
Type of building
Public
High occupancy
Critical use
High rise of commercial buildings, offices, hotels, dwelling houses (>3)
Manufacturing and storage structures for large amounts of toxic substances
Hospitals, Schools, fires and police stations etc.
Auditoriums, theaters
Significant historical monuments

RESEARCH FOR PROTECTION OF BUILDING STOCK AGAINST SEISMIC RISK BASED ON THEIR FUNCTIONAL PROPERTIES

The regulation of the social and functional processes in urban development can be realized by town planning. The concentration and location of urban functions is based on the usual social relations between the inhabitants, their general demands, their work and their ways of recreation.

The research on the functional properties, which influences the historical building stock seismic risk, must be carried out by analysing of several similar objects. Those should be done in the historical area of modern cities like Tbilisi (Capital of Georgia), Istanbul (Turkey), Skopje (Capital of Macedonia), Rome (Capital of Italy).

The research on functional properties includes:

- Objective survey of the study area;
- Definition of the functional meanings of the objects;
- Collection of features regarding the technical and economical meanings of research area (building stock);
- Description of the building stock according to its level of seismic risk with the active use of seismic microzonational map of the territory: highest , high , moderate, low and lowest hazard area.

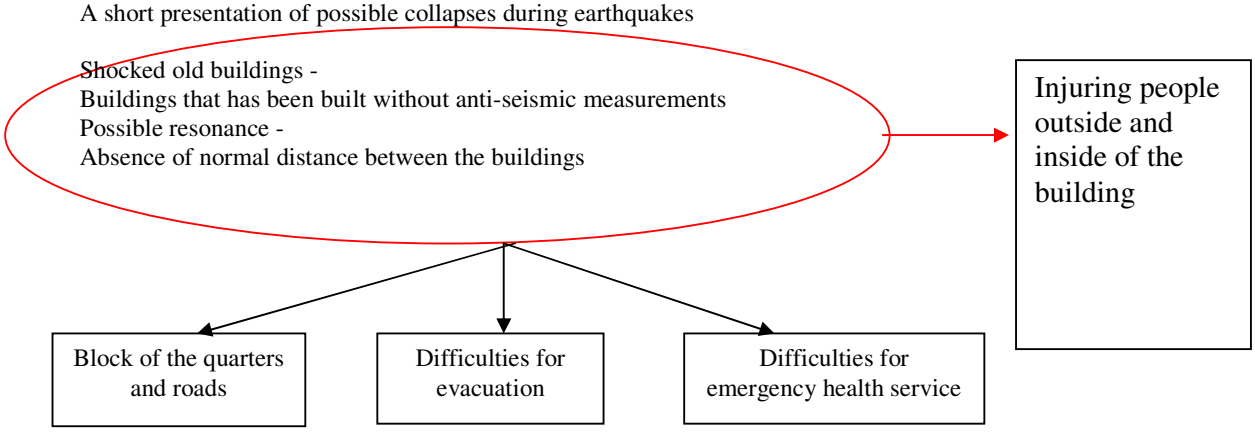
On the basis of above mentioned surveys it is recommended to prepare a scenario of a possible earthquake so that the seismic risk inside the defined area can be studied by alternating some of the functional properties:

- To take away some objects of critical use;
- To designate special functions to the historical centre like tourism, culture, education or business.

The complexity of this study regarding the functional properties will give us the possibility to be able to make some recommendations of seismic risk reduction.

P.S.

A short presentation of possible collapses during earthquakes



A short description of the appearance (causes) of earthquake secondary activities and their danger