Urban risk assessment and management in the enlarged EU, recent status and trends

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Abstract

A detailed qualitative study on assessing and managing urban risks, co-financed by the European Commission (EC), is in progress. Key findings and preliminary results underline the importance of safety and security issues for urban life quality. This paper presents the findings of this study aiming at proposing a European wide strategy for Urban Risks assessment and management by taking into account legal status and current practices at EU 25. A structured questionnaire was addressed to National Authorities aiming to gain an insight into existing law provisions, emergency planning and urban risk management practices. An analysis of the replies highlighted the diversity of both urban risks and emergency management structures. The risks investigated cover a range from natural catastrophes and technological failures to terrorism and intended actions threats. Risks were ranked by priority according to frequency of occurrence and consequences. The scaling of hazards, the identification and mapping of risks, the severity of consequences and matters concerning mutual assistance in major emergencies are identified as the priority fields. A refined version of the results, following consultations with the parties involved and the EC forms the basis of the project proposals.

The complexity of the modern urban Environment, urbanisation trends, increasing vulnerability and the different approaches in dealing with urban risks, indicate a clear need for a common platform and a unified approach across the EU. Basic components of a suggested unified approach and an EU wide mitigation strategy are also discussed.
Keywords: Security, risk mitigation, urban risk, risk assessment, risk management, strategy elements, terrorism, urbanisation, emergency response.



1 Introduction

Two major trends characterise modern societies: 'urbanisation' and 'globalisation' which after the 9/11 events in the USA and other terrorist attacks in Europe and worldwide, were coupled with 'securitisation'. Intended actions form a new type of threat for the modern urban environment. As a response to these threats the applied research community, national authorities and international organisations devote considerable efforts to cope with improving safety and security for citizens.

Disasters, major accidents and terrorist actions are under the microscope of science, technology and the media. The concentration of people and activities in limited space, have resulted in the creation of megacities increasing thus the vulnerability of systems and networks that are necessary for the operation of the complex urban environment. On the other side satellite capabilities, military based applications and technology achievements are broadly used for the development of systems aiming to improve safety and security level in the urban context.

When disasters hit densely built or densely populated urban areas the consequences are far worse than in other environments. With growing urbanisation and more and more small and large-scale disasters occurring in urban areas, years of development effort and labour are continually being destroyed[1]. Urban settlements represent concentrations of production, economies and social development, at the same time generating risks and encompassing vulnerabilities not only for its residents, settlements and assets but often also for economies in regional, if not global, extent[2]. With the spread of terrorism in recent years security has become an inevitable feature of modern urban life, particularly for those living in urban centers. It seems then that "*The trend is for the risk to become urban*" [3].

2 The urban risk study

The project 'Assessment and Management of Risks in Urban Areas' is an effort co-funded by the European Commission/Directorate General Environment/Civil Protection (CP) Unit. It aims at improving the assessment and management of urban risks and elaborating a set of recommendations for a EU25 wide strategy proposal. Many types of urban risks are taken into consideration in the study. More specifically the analysis includes: Natural disasters, Technological risks, Nuclear, Biological and Chemical risks (NBC), Terrorist threats and other types of risks as threats on networks and urban infrastructure, every day risks, etc.

However, in the EU25, each member state has its own policy to deal with risks in urban areas. To date, a unified European policy and methodology for assessing and managing urban risks does not exist. Although *vulnerability* in the urban environment is exhaustively discussed in the research community there is not a unique methodology, criteria and thresholds generally accepted, to assess it. On the other side *risk mapping* in Europe has not reached unified standards [4].

The methodological analysis follows a review of EU and non EU projects, evaluation of the replies provided by CP authorities in a qualitative questionnaire, interviews with experts and an assessment of national risks. 23 EU Member States (MS) Civil Protection national authorities participated in the exercise. Among the key points identified in the analysis, are:

- European and international projects reviewed show a clear trend to start from natural risks -primarily dealing with the earthquake risk, probably the most deadly and costly one worldwide- and move towards proposing various mitigation strategies for all types of risk.
- Modern urban communities are highly reliant on their utility networks and service infrastructures. These *lifelines* are significantly dependent on each other. Their vulnerabilities highly contribute to the overall urban risk level.
- Each of the urban functions and elements has an impact that will contribute to the overall environmental impact of the city. However, the different policies that address these elements often act in isolation from each other, being managed by different administrative departments. A gap between urban planning and the overall urban risk is identified [5].
- Although there is no standard practice or methodology for risk assessment and management applicable to every European city, there is a common process that should include the following phases: identifying hazards and potential threats, analyzing risk, assessing vulnerability, building institutional knowledge and local capacity, emergency planning, training and exercising and integrating emergency management into day-to-day government action supported by dedicated financial and human resources.
- On the other side the development of emergency management programmes carried out by a number of countries emphasize establishing national policies and initiatives but seldom target the specific conditions pertaining to large cities. In most cases, the central government retains the authority for disaster management programmes, which are often focused on developing response capabilities, instead of pro-active mitigation policies.
- Effective urban risk management requires close coordination at local level and the participation of all sectors that influence local communities: central emergency services, sector ministries, private sector organizations, as well as community organizations, NGO's and volunteers. The role of local actors is being increasingly recognized. Decentralization of urban risk management implies delegation of competencies and resources to the local level keeping in mind the subsidiarity principle. Urban risk related national legislative provisions need further efforts to be fully implemented in several EU states.
- Focusing in the European context of risks and threats it comes true that: A clear vision, an overall strategy and an action plan to achieve agreed objectives and targets are necessary to provide a framework to guide and steer daily management decisions. Changes in attitude are equally important. Public participation and the active role of the citizen, transparency in decision making and accountability are key elements of sustainable urban safety and security management.



3 Project work results

Preliminary results drawn from the Project work, to date, can be summarised as follows:

3.1 Current situation

Today we can identify a lot of urban safety and security provisions coupled with risk reduction policies and measures Europe-wide. A good level of urban risk perception exists in MS and EC initiatives (e.g. RTD research, action programmes, CP mechanism) have so far resulted in effective networking among, at least, national authorities and emergency management agencies, leading thus to certain results. But we can also note that urban risk assessment and management lacks the following:

- Integration of emergency plans among the different levels of government
- Sharing responsibilities among central, regional and local authorities
- Communication among local authorities, e.g. different radio frequencies
- Database architectures adaptation and integration of data resources
- Citizen's information and education in law and safety codes provisions
- Common glossary, definitions and urban risk communication methods
- Common EU signs and signals to inform citizens about existing risks
- Relevant statistics and data, urban risk scaling and mapping across the EU
- Proper implementation of the single emergency EU call number -112-
- Co-ordination among the actors involved in urban risk management
- Effective cooperation in risk related issues among EU major cities
- A common approach among EU25 MS in urban risk assessment and management methods and tools.

3.2 Local, regional and national authorities

- The problem of security in the field -both the more general safety and security situation relating to local populations and the more specific requirements of urban areas- are priority issues.
- Poorly designed and implemented urban development policies, badly selected location for housing, networks and infrastructure establishments, missing or non-enforced land use regulations and poor implementation of construction and safety codes all contribute to increased vulnerability and the consequent risk. These factors result in increased damage inflicted during hazardous events.
- Decentralisation of responsibility for prevention of, intervention in, and recovery from, disasters and crises in human settlements and urban centers are essential to ensure efficient emergency response.
- Interoperability of means, instruments and resources is a vital parameter towards successful interventions and effective response in emergencies.

3.3 Civil protection authorities and emergency services

- Emergency services should not create artificial barriers between natural and human-caused disasters, because the one often influences the other or sometimes results from it. Urban risk assessment and management are as important before, through and after a disaster or a crisis.
- In emergencies, security information should be transmitted as quickly as possible to the most appropriate actors and those acting on the scene. Although much security information is often available, it is not easily accessible to actors and decision makers in critical situations.
- Understanding and respecting one another's missions are necessary conditions for effective collaboration in the complex environment of a crisis. Effective co-ordination among institutions, services, actors and stakeholders still remains a critical and open issue.
- The importance of leadership to increase the professionalism, capacity and resources of competent authorities and involved organizations dealing with crisis management should improve at regional and local level.
- A real need is to increase institutional capacity of cities, as living organisms, and their competent authorities to implement long-term risk reduction programmes. This includes the establishment of the required legal, financial, political, social and organizational frameworks.

3.4 Citizen involvement

- Disaster, risk and crisis prevention starts with the attitude of individuals, responsibles and communities towards commonly or historically faced risks. Actions or even inactions of individuals towards protecting their livelihood or community bear significance on how society approaches risk assessment and vulnerability reduction. In urban centers, everyday living needs and societal pressure further reduce awareness towards self-protection and individual involvement in risk management.
- Thus, risk mitigation efforts should start with the development of a culture of prevention to citizens and to the local community that installs primary involvement on civil protection with the individual. Yet, defining a strategy for influencing cultural attitudes poses unique challenges and requires significant commitment at various decision making levels.
- While educational programs provide the basic framework, several other approaches need also to be integrated, including community involvement and partnership agreements, risk information and communication campaigns, professional competence training, and institutional strengthening.
- The first step in managing urban risk is to fully understand the hazards facing a community, and the potential impacts these hazardous events may have on citizens. Thus public risk perception plays a vital role in the medium and long-term efforts to manage risks and minimise their impacts.

4 Elements of an EU wide strategy

Since the above-mentioned Project work is in progress a detailed analysis of a Strategy proposal with references to the specific topics is under development. According to the Project provisions this proposal will pass shortly an evaluation phase from the contributors, namely the 23 national Civil Protection representatives to EC. Therefore a presentation of the main strategy elements follows here with a brief reference to more specific topics.

The EU wide Strategy proposal and its elements are mainly focused on the status, characteristics and concerns of the European citizens, who live, work, use or share the major urban centers across the enlarged EU. Specific characteristics of the European cities and their long history and tradition are also considered. Open issues and further questions on the subject are briefly discussed in the next chapter.

4.1 General strategy tasks

1- Natural and human-caused emergencies are increasing in regularity, and perhaps more importantly, their impacts on populations and human settlements, especially on the major urban centers across Europe are rising alarmingly. There is a clear need *to develop innovative approaches and re-examine traditional policies* on urban risk assessment and management within the framework of longer-term development strategies.

2- Sustainable relief in human settlements is *a process*. To be achieved, a series of *guiding principles* is necessary to be agreed at local, regional, national, and at European level. These guiding principles serve to formulate *a platform*, to build up *an open dialogue*, to identify and communicate needs, to homogenise procedures and to ensure that such a strategic intervention has a positive effect on the sustainable and equal development of human settlements.

3- To this task, and taking into account the expressed will of those cities and states repeatedly affected, reality urges the establishment of a permanent link between emergency management and the transitional phase of development, including urban risk reduction. Following a series of successful networking efforts -like e.g. the EUROCITIES network [6]- the urgent task emerges *to re-examine the roles and responsibilities* of the three main stakeholders, namely the international community at EU25 level, civil society and national/local authorities. Promoting horizontal city-to-city, community-to-community *networks* would foster the creation of viable and less vulnerable, better protected, safer and secure communities.

4- Urban risk management should be integrated into the relevant regional programmes and policies; it should be cross sectoral thus complementing the overall concept of sustainable relief and development. *Urban risk management is a joint responsibility,* which should be facilitated by solid political commitment and sound institutional support.

5- Cities are managed and communities interact *at the local level*. On the other side disasters and crises have *a strong local component*. Active participation of civil society is crucial to achieving a sustainable risk management strategy, as well as recovery from a crisis. When a disaster strikes, the most vulnerable segments of society are the ones mostly affected.
6- Joint efforts of the communities, the private sector, institutions and academia would strengthen the voices of the civil society towards more inclusive and comprehensive risk assessment and emergency management strategies. Dialogue on funding urban risk management should be encouraged. Resources tend to categorize emergency, reconstruction and development. Donors often associate risk reduction as an aspect of emergency or recovery funding, whereas *it should categorized as a development issue* and needs to generate funding and resource *on a long term basis.*
7- *Decentralization and the empowerment of local authorities* is a main topic to deal with. Response and recovery in post-crisis environs is a process in which the roles and responsibilities of various actors at all levels need to be clearly defined. Social inclusion, transparency and accountability formulate the basis for building trust and the sense of safety in society as a whole.
8- Starting point should be the elaboration of *the legal and policy framework* followed by strategic leadership and planning, co-ordination within local authorities and 'governance links' to community *assisted by EU initiatives and support.* But decentralization is not just about shifting of power and resources from the center to the local authorities and municipal levels, as an end in itself. Decentralization is about the public interest, particularly important in post-disaster and post-crisis response and the reconstruction process.

4.2 Specific strategy tasks and related policies

1- *Risk Identification:* A detailed understanding of what events have occurred in the past in a specific geographical area or in the urban context of a city and their consequences provides the basis for understanding what could happen in the future, i.e. it is a key step in the risk identification process.
2- *Risk analysis, mapping and vulnerability assessment:* 'Risk analysis' is the systematic use of available information to determine how often unlike events may occur and the extent of their likely consequences. It forms an important step in risk assessment and management. Risk mapping is important for decision making. Vulnerability assessment is a relatively new area of study in Europe and is focused on the vulnerability of a wide range of elements at risk within the community or the urban complex e.g. the people, buildings, networks, utilities and infrastructure. A significant effort has been already made to assemble detailed data on the principal elements at risk in the built environment of major cities, especially in the European South –as more hazard prone area to disasters- whilst comprehensive statistics and IT can provide data and figures to assess and approach human and social vulnerability.



3- *Security considerations:* The security of the community can be assessed in terms of its health and wealth and by the forms of citizen protection that are provided. Physically, these may be assessed by the availability of hospitals, nursing homes, industries, commercial premises, ambulance stations, fire stations, police stations and security infrastructure. Also important are socio-demographic and economic issues related to sensitive population groups as the elderly, the very young, the disabled, household income, unemployment, home ownership and the resources available at the fire and police stations. Emergency plans are also a key component of community security e.g. large events organisation in cities requires increased security provisions.
4- *Social aspects:* They include some of the more intangible measures such as language, ethnicity, religion, nationality, community and welfare groups, education, awareness, meeting places, cultural activities and so on. Some of these may be measured in terms of the facilities that they use, such as churches and sporting clubs, however, the more meaningful measures relate specifically to the individuals, families and households that make up the community. The most important for risk assessment is a good understanding of the social, demographic and economic dimensions of vulnerability under both the 'safety' and 'security' components.
5- *Synthesis and modelling*: The range, amount and variety of information needed to compile a comprehensive (and total) risk analysis and quantitative assessment is enormous due to the complexity of the urban environment. Whilst there are many sources now available from which such information can be derived, much of it with the essential spatial and temporal attributes needed, there remain important gaps. Our knowledge of hazard phenomena and the processes that drive them, for example, are far from perfect. It is much more complicated when dealing with unexpected events. It is necessary, therefore, to develop appropriate models and/or scenarios to fill the knowledge gaps. The behaviour of some hazards, such as floods or earthquakes, may have an established body of modelling research behind them, whilst others, such as extreme weather phenomena, CBN threats and terrorism are less well served in EU.
6- *Warnings and forecasts*: An effective warning and forecasting system, combined with a high level of community awareness and risk perception, is clearly one of the most potent mechanisms by which to achieve effective risk management. These are typically taken to mean short-term warnings, such as those issued by the Meteorological Services for hazards that can literally happen, such as floods, hurricanes and storms.

4.3 Uncertainty level

Urban risk management mostly means *dealing with the unexpected* in the complex urban environment. It is then clear that *uncertainty* is a key factor in urban risk assessment and management. The effectiveness of risk management strategies is inversely proportional to the level of uncertainty that exists. The risk management process, particularly the risk analysis and risk evaluation stages, is

clearly aimed at developing the best and most appropriate policies aiming at reducing uncertainty level.

Given these uncertainties, we should remain cautious about presenting most of these preliminary results as anything more than *indications* of what the future may hold. The overall objective of urban risk management is to minimise risks and losses from hazardous events that lead to major emergencies. In this context, risk reduction efforts might be seen as the process by which the uncertainties that exist in potentially hazardous situations can be minimised and public (and environmental) safety and security be maximised.

4.4 Institutional arrangements

From the Project work done so far and the analysis of results it becomes necessary that new institutional arrangements should worked out to cover urban risk management multi-sectoral needs, co-operation and coordination. As the policy emphasis is moving from post disaster reconstruction towards more proactive approach of emergency preparedness, the centralized institutional arrangements are gradually giving space to decentralized responsibilities of local governments, municipalities and communities.

4.5 Financial instruments

The increasing economic and social costs of disasters, technological failures, accidents, intended actions and their consequences as well as the high reconstruction costs necessitate the development of financial policies, appropriate instruments for risk sharing and risk transfer as a component of urban risk reduction and effective management. National economies, regional and local funds are not sufficient in most cases to bear all rehabilitation costs and secondary effects (e.g. unemployment, productivity loss). Insurance and reinsurance mechanisms are essential for loss recovery and post emergency reconstruction. Tolls and financial incentives can promote proactive disaster risk reduction investments. But this is not a task that could be served at local or regional level only. The existing EU solidarity fund should serve as an example to cover immediate citizen's needs, following catastrophic events, and contribute to reconstruction efforts under certain terms and circumstances. Local and regional authorities could also contribute in advance to the costs sharing by developing cost evaluation methods and mechanisms and redirecting regional funds to risk prevention and risk management needs especially in hazard prone areas.

5 Conclusions and discussion

Among the various efforts devoted in assessing and managing risks only a few target the specific conditions pertaining to cities in Europe. The strategy elements mentioned above serve as input for preparing adequate policies at national, regional but mainly at local level that will lead to certain measures. Decentralisation of means and resources should be a guiding principle while

interoperability in communication ethics and means, intervention tools, resources and equipment, is essential. All risk related policies and measures should target to a safer EU citizen. Effective urban risk assessment and management is a long term participatory, cross-sectoral process.

An EU strategy towards improving urban risk management should focus on:

- Strong participation of local players, actors and stakeholders
- Coordinated structures and effective networking with other communities
- Informing the citizen and promoting self-protection measures
- Strengthening local capacity, funding opportunities and tools development
- Ensure a safe organisation of response under acceptable security measures

Risks will continue to impact on the most vulnerable citizens of the EU towns and cities. Joint efforts of the communities, private sector, institutions and academia would strengthen the voices of the civil society towards more inclusive and comprehensive urban risk management strategies. To this task the dialogue on funding risk related initiatives should be encouraged. The legal and policy framework required could be discussed at EU level, as a priority issue, and meet the EC support, with respect to the subsidiarity principle and the national risk prioritization and acceptance.

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