

Report of the workshop  
**“Building resilient communities through urban planning and the  
integration of Natural Sciences”**, Geneva, 13 January 2015<sup>1</sup>

Draft of 8 February 2015

### **Introduction**

Natural and human-induced hazards strongly affect vulnerable populations, especially the urban poor. These hazards, along with the effects of climate change, are posing unprecedented challenges to cities and human settlements, and they are a serious threat to the social and economic development of the UNECE region. The vulnerability of these hazard-prone regions is exacerbated by dense population in hazardous areas, environmental degradation, unsustainable use of water and natural resources, and poverty. Further impacts include the increasing value of buildings, an infrastructure that deprives many social groups of adequate and affordable housing, lack of access to information, and deficiencies in urban planning and governance in emerging countries and cities. Many of these impacts are the consequence of natural hazards, and they can be prevented if governments develop and implement urban planning tools and policies using knowledge available in natural science on hazards and risks.

### **The workshop objectives**

This workshop “Building resilient communities through urban planning and the integration of Natural Sciences” was organized by the University of Geneva and the UNECE Committee on Housing and Land Management on 13 January 2015 in Geneva, Switzerland.

The workshop discussed the integration of hazards, risks analysis and Natural Sciences into policy making with a focus on urban development. The outcomes of the workshop will be used to prepare a chapter on “Safe and Resilient Human Settlements” in the UNECE policy study on urban planning.

### **Attendance**

Representatives of the governments of the following ECE countries participated in the meeting: Azerbaijan, Malta and Switzerland.

Representatives of the Joint Research Centre of the European Commission (JRC), Secretariat of the UNECE Environment Division, UNHCR, WHO, WMO and GEO attended the workshop.

Representatives of the following non-governmental organizations, academic and private sector partners also participated: ICES, CNAPPC, INWEs, Catalan Circle for Business, Global Institute for Water, GIWEH, Shelter Centre, URBATER, NOA Greece, UPMF-Grenoble, TU Darmstadt, University of Geneva, National School of Public Administration and Local Government Greece, Politecnico di Milano,

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<sup>1</sup> The workshop agenda and presentations are available at <http://www.unece.org/index.php?id=37512#/>

Swiss Federal Institute of Technology, The Glasgow School of Art, Kobe University, University Federico II of Naples, University of Bologna, University of Twente, and representatives of the private sector.

### **Summary of the workshop discussion**

#### b) Opening of the workshop

Prof. Jérôme Lacour, Dean of the Faculty of Sciences at the University of Geneva, opened the meeting and welcomed participants. The Dean underlined the good cooperation established with the with UNECE.

Ms. Gulnara Roll, Head of the UNECE Housing and Land Management Unit, expressed her appreciation to the University of Geneva for providing the expertise and hosting the workshop. Ms. Gulnara Roll, also informed about the activities of the UNECE Committee on Housing and Land Management, especially on the preparation of UNECE country profiles on housing and land management and the smart city project.

Prof. Bonadonna, University of Geneva, informed about the modalities of afternoon session organized in three simultaneous breakout discussions.

#### c) Session One

the first session explored the different types of hazards and natural phenomena affecting human settlements in the region, considering: seismic hazards in urban areas, climate change, multi-hazard, impact assessment, human induced disasters and spatial planning approaches to mitigate disasters.

The first part of this session focused on the risks from earthquakes.

Prof. Fäh noted that scientific community can provide modelling tools to predict impacts of earthquakes but, still, the nature, frequency and size of events are based on probabilistic methods (subject to uncertainties).

Science integration should support land-use planning, building codes, risk-based decision-making and support public programmes of awareness rising. Furthermore it was reported that assessment of risk should be mostly implemented at local level (i.e. micro-zoning).

Prof. Dandoulaki reported the experience of science integration in planning after the earthquake in the City of Kalamata, Greece, which took place in 1986. The earthquake impact in the city created the awareness among the decision-makers and therefore “opened a window of opportunity” to integrate prevention and resilience measures in the new city plan.

The second part of the session focused on vulnerabilities induced by climate change.

Prof. Beniston reported that cities are heavily impacted by the climate change. Citizens are increasingly exposed to the phenomena that include heat waves, flash floods and air pollution.

Ms. Sjödin, a member of the UNISDR Urban Planning Advisory Group, informed the workshop participants about the measures that the municipality of Karlstad (Sweden) is implementing. The municipality appointed a flood management officer in the city government who provides expert based recommendations to the planning process at town level.

The flood management officer provides information on potential hazards and data (for instance, flood risk maps, data on water level surveillance and geotechnical investigations) and advice on possible planning measures, for instance, on the protection of critical infrastructure.

The third part of this session focused on the multi-hazard approach.

Prof. van Westen presented good practices for spatial decision support system for the analysis of multi-hazard risks. Fundamental indicators include: return periods, hazard type, asset and population exposure and degree of vulnerability. Examples from Uganda, Caribbean and Caucasus were presented.

Prof. Galderisi underlined the high complexity of contemporary cities that increase the exposure to multiple hazards including natural technological and man-made disasters, often combining. The interplay of events of different nature occurs both in space (multi-site) and in time (interval and consequential relationship). It was noted that urban planners should be provided with multi-hazard maps to allow a comprehensive valuation of planning alternatives. Furthermore the reduction of both institutional and technical gaps is fundamental to design more resilient communities.

The fourth part of this session addressed impact assessment.

Mr. Leroi provided examples of the concepts of resilience, systemic vulnerability and functional vulnerability. Reduction of vulnerability could be achieved with strong integration of risk management and land development. Damage assessment profiles provide support to decision makers and disaster response authorities to allocate resources for reconstruction to minimize induced damages (in the long term).

Prof. Menoni provided examples of methodologies to assess and record post disaster damages. It was reported that exposure to damages is different across sectors and scales, and specific data are necessary. Pre-disaster scenarios are useful to support cost-benefit analysis and portfolio decision making in urban planning.

In the last part of this session Mr. Savov presented the activities of UNECE Convention on Transboundary Effects of Industrial Accidents to further describe the threats deriving from technological disasters. Land use planning is fundamental to minimize cross-boundary effects of industrial accidents (minimising the consequences on citizens' health and safety).

Mr. Gatt described the approach used by the government of Malta towards the preparation of the Strategic Plan for Environment and Development. It was reported that spatial planning is key to reduce risks by controlling development location (especially in coastal zones), densities and siting of infrastructures and critical facilities.

#### **d) Session Two**

Dr. Ehrlich (JRC) opened session two presenting the Global Human Settlement Layer recently introduced by JRC to support decision making with technological tools. Technology could support decision-making by improving information availability and accuracy. Remote sensing tools could be as refined to recognise building typologies from which economic losses could be easily assessed.

Mr. Melchiorri and Mr. Sampson (UNECE Housing and Land Management Unit) presented the initiative of the UNECE Committee on Housing and Land Management for the preparation of a policy study on urban planning as requested during the 75<sup>th</sup> Session of the Committee.

The study includes seven policy areas: 1) Fundamental Services and Informal Settlements; 2) Sustainable Accessible and Inclusive Mobility and Transport; 3) Safe and Resilient Settlements; 4) Spatial Dimensions of Sustainability, Compactness, Climate Responsive Design and Energy Efficiency; 5) Healthy, Livable, Vital and Inclusive Public Spaces; 6) Between Rural and Urban, the Links for Better Regional Policies; 7) City Governance and Regional Cooperation.

#### **e) Breakout Sessions**

Participants were invited to join three thematic groups, according to individual expertise of the participants. At the end of session, each group reported on the outcomes of group discussions.

**The first group** focused on identifying main impacts of natural and human-induced hazards on cities and human settlements. Ms. Manzella, the first group rapporteur, underlined that citizens' security and systemic resilience are among the key objectives of science and urban planning integration. She explained that according to the participants, there is a lack of understanding of direct and secondary impacts of natural and technological disasters; as well as a lack of comprehensive damage assessment methodology to assess physical damages in the built environment.

**The second group** was asked to determine the type of hazard data and evaluation required by policy makers for a comprehensive and risk-sensitive urban planning. Mr. Melchiorri reported that the group agreed on the need of aggregate risk indexes and maps to support decision makers.

Urban planners instead should be informed with disaggregated hazard assessment with clear classes of vulnerability. The need of digital and interactive information (GIS, models and digital cartography) was highly consensual. The noticeable institutional gaps in planning related decision-making introduces uncertainties in the target agencies, bodies or expertise to be informed with hazard data. The minimal standard toolkit for risk informed decision making require: digital elevation model data, ortophoto, built-up and critical infrastructure networks. Furthermore it was agreed that risk informed planning should be reflected more in adaptive design measures rather than statutory limitations to building practices (that might stimulate informal practices).

**The third group** was invited to identify the main challenges associated with the integration of hazard maps within risk-sensitive urban planning. According to the group rapporteur, the discussion allowed to identify three main challenges. The first challenge is the identification of the roles and responsibilities of actors involved and establishment of the communication and mutual understanding between policymakers and scientists. The second challenge is about the decision on the level of acceptable risks according to hazard types. The third challenge is the development of the risk awareness among planners. The planning must be resilient and ensure that the cities are safer places to live and work.

**f) Closing of the session and next steps**

UNECE Housing and Land Management secretariat informed that the next meeting of the task group will be held on 24 February 2015 in the framework of the thematic workshop organized by the UNECE and the Ax:Son foundation. The workshop will address the thematic of policy area 5 “Healthy, Livable, Vital and Inclusive Public Spaces”.

Prof. Costanza Bonadonna thanked participants and closed the meeting at 17:45.