Proposal of combined risk management plans in the IT test site

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Sommario

1. Introduction

So far there are no available multirisk plans for the Italian site, nor for the Hr site. This deliverable entirely capitalizes the results of the contribution

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and from the contribution:

Where are we with multihazards, multirisks assessment capacities? Jochen Zschau, https://drmkc.jrc.ec.europa.eu/portals/0/Knowledge/ScienceforDRM/ch02/ch02_subch0205.pdf

Please refer to the above papers to have a detailed insight on the topic. We hereby declare that what reported below is entirely drawn from the above sources and that this deliverable is not in the position of proposing reliable multirisk plans, rather it intends to contribute to the discussion about the topic.

2. Worldwide state-of-the art

The Sendai Framework for Disaster Risk Reduction states that "disaster risk reduction practices need to be multi-hazard and multi-sectoral-based, inclusive and accessible in order to be efficient and effective". Consideration of interactions between risks can make a great difference not only to hazard, risk and vulnerability assessment but also to the related decision-making processes.

On the one side, reducing the vulnerability to one hazard may increase it for another one. For example, in Kobe, Japan, the reinforced concrete roofs made to resist cyclonic winds contributed to the increased vulnerability of these buildings during the 1995 earthquake. Building construction practices made use of heavy roofing materials to protect the buildings from heavy winds, a concern in a city periodically subjected to tropical cyclones. However, the heavy roofs, in turn, made the buildings more vulnerable to earthquake damage. In California, USA, the earthquake proof houses built in wood made entire neighbourhoods vulnerable to fires, as shown during the 2017 wildfires causing the evacuation of thousands and the displacement of more than 7000 households.

On the other side, synergies resulting in the mitigation of multiple risks can also occur. For example, with little additional investment, the cyclone shelters currently being constructed alongside the Indian Ocean could serve also as multi-purpose shelters for cyclones and tsunamis (ibid).

There is a growing awareness that contemporary disasters are an interactive mix of multiple natural, technological, and social events and that considering interactions of risks and emerging cascading/domino effects is essential to improve risk management. On several occasions' inadequate and/or dysfunctional governance have exacerbated the negative consequences of cascading disasters and increased vulnerability. An example is the Fukushima disaster in 2011: a great offshore earthquake (magnitude 9, the largest in Japan's history) triggered a tsunami. The combination of these two events led to the joint failure of the Fukushima Daiichi nuclear power station. This event has been defined by the National Diet of Japan as a failure of risk governance or, more properly, of multi-risk governance.

However, there is little research into (i) the added value of multi-risk in comparison to single risk governance and (ii) the hallmarks of multi-risk governance frameworks and policies.

While new theories and methods for multi-risk assessment have been developed in the past decade the same is not true for multi-risk governance.. There are many open issues related to this concept, its operationalization and implementation. First, the allocation of legal responsibilities for domino effects is not always clear. For example, although there are significant differences between countries, the sharing of responsibility between the public and private sector is especially unclear. Second, the lack of authorities responsible for reducing the risks generated by those domino effects is definitely a problem, along with difficulties in mainstreaming multi-risk governance into risk policies.

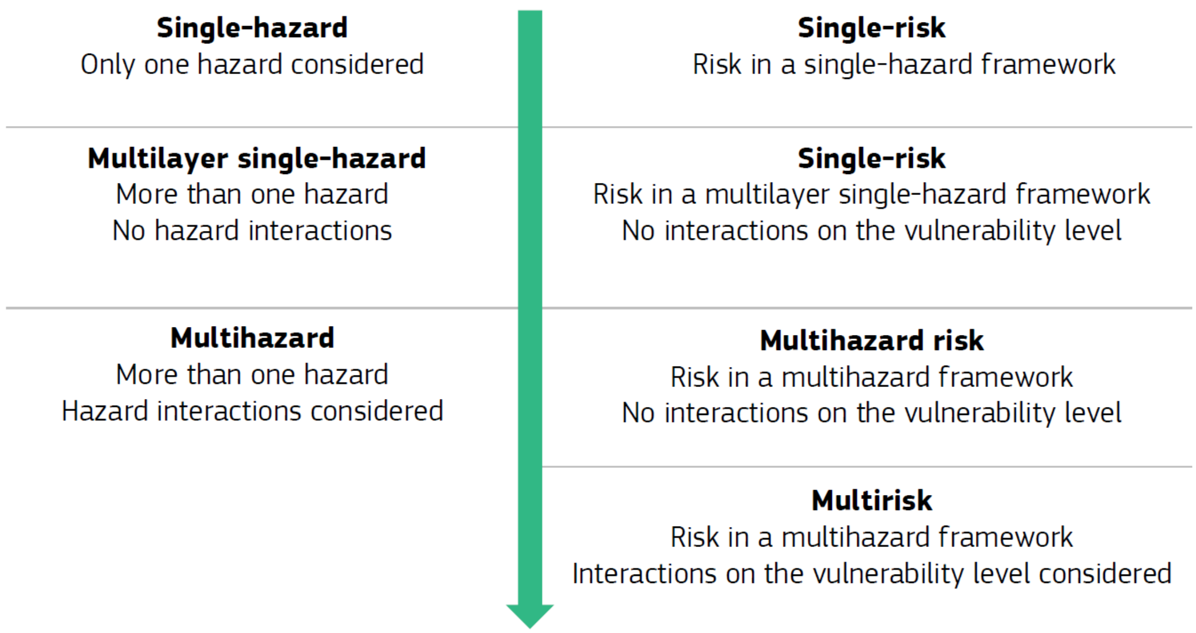

Fig. 1 taken from : Where are we with multihazards, multirisks assessment capacities? Jochen Zschau, https://drmkc.jrc.ec.europa.eu/portals/0/Knowledge/ScienceforDRM/ch02/ch02_subch0205.pdf

The Agenda 21 for Sustainable Development (UNEP, 1992), the Johannesburg Plan for Implementation (UN 2002), the Hyogo Framework for Action (UNISDR, 2005) and the Sendai Framework for Disaster Risk Reduction (UNISDR, 2015) promote multihazard risks of natural hazards. Together with the International Decade for Natural Disaster Reduction (IDNDR) from 1990 to 1999 and the following permanently installed International Strategy for Disaster Reduction (ISDR), they constitute a worldwide political framework for the initiation of a multitude of scientific projects in the risk research community (Zentel and Glade, 2013). These projects include global index-based multihazard risk analysis such as Natural Disaster Hotspots (Dilley et al., 2005) or INFORM (De Groeve et al., 2015). They also include regional multihazard initiatives like the cities project for geohazards in Australian urban communities (Middelmann and Granger, 2000), the RiskScape project in New Zealand (Schmidt et al., 2011) and the platforms HAZUS (FEMA, 2011) and CAPRA (Marulanda et al., 2013) for the automated computation of multihazard risks in the United States and Central America, respectively. The European Union funded projects on multihazard and multirisk assessment within its framework programmes FP4, FP5, FP6 and FP7. The TIGRA project (Del Monaco et al., 1999) and the TEMRAP project (European Commission, 2000) were among the first attempts to homogenise the existing risk assessment methodologies among individual perils. The European Spatial Planning Observation Network (ESPON) compiled aggregated hazard maps weighting the individual hazards by means of expert opinion and taking into account various natural and technological hazards in Europe (Schmidt-Thomé, 2005).

3. Multirisk in EU countries

Multirisk is not systematically addressed among disaster risk management in EU countries (Komendantova et al., 2013a, 2013b, 2014, 2016; Scolobig et al., 2013, 2014a, 2014b). Single-hazard maps are still the decision support tool most often used in DISASTER RISK MANAGEMENT, even more often than single-risk maps. Along with the missing link between scientific multirisk assessment and decision-making in DISASTER RISK MANAGEMENT comes a general lack of integrated practices for multirisk governance.

3.1 Expected benefits

The practitioners involved in the Matrix study emphasised the following benefits: • ranking and comparison of risks.

• Improvement of land-use planning, particularly as the multirisk approach provides a holistic view of all possible risks. It may influence decisions about building restrictions, which themselves may influence urban and economic planning, for example by regulating the construction of new houses and/or economic activities.

• Enhanced response capacity, because a multirisk approach would allow planning for potential damage to critical infrastructure from secondary events and preparation for response actions.

• Improvements in the efficiency of proposed mitigation actions, cost reductions, encouraging awareness of secondary risks and the development of new partnerships between agencies working on different types of risk. 2.5.3.3 Barriers Barriers to effectively implementing multirisk assessment into DISASTER RISK MANAGEMENT are found in both the science and practice domains as well as between them. In addition, individual perceptual and cognitive barriers may play a role in both domains (Komendantova et al., 2016). Barriers in the science domain mainly relate to an unavailability of common standards for multirisk assessment across disciplines. Different disciplines use different risk concepts, databases, methodologies, classification of the risk levels and uncertainties in the hazard- and risk-quantification process. There is also an absence of clear definitions of terms commonly agreed across disciplines, including the term 'multirisk' itself, for which there is no consensus as regards its definition. These differences make it hard for various risk communities to share results, and hence represent a barrier to dialogue on multirisk assessment.

3.2 Risk management

A lack of quantitative information on the added value of multirisk assessment is perhaps more worrying for risk managers than for scientists. The risk managers who participated in the Matrix study pointed out that there are not enough quantitative multirisk scenarios or their comparisons with single risk ones available from which they could learn about the added value of multirisk. Furthermore, they miss criteria or guidelines that would help them to select the scenarios to be included in a multirisk assessment. Most worrying for them, however, seem to be the strong limitations quantitative multirisk assessment methods, in their opinion, have when one regards their user friendliness. According to them, a high degree of expertise is often required to use the scientific tools, resulting in a restriction of their application to only a narrow number of experts. Multirisk is presently not systematically addressed among DISASTER RISK MANAGEMENT in EU countries. The barriers to the implementation of MRA include a lack of agreed definitions Moreover, poor cooperation between institutions and personnel, especially when risks are managed by authorities acting at different governmental levels, was identified as a major reason for a lack of integrated practices for multirisk governance in the practical domain (Scolobig et al., 2014a). Decentralised and centralised governance systems have their own weaknesses and strengths in this regard (Komendantova et al., 2013a; Scolobig et al., 2014b). Furthermore, in some cases a multirisk approach is perceived as competing with rather than complementing single-risk approaches. The Matrix study also argued that in many European countries the responsibility for DISASTER RISK MANAGEMENT has steadily been shifted to the local level (often to the municipal level) without providing sufficient financial, technical and personnel resources for implementing necessary programmes (Scolobig et al., 2014a). This is a clear obstacle for implementing multirisk methodologies. Finally, there are individual cognitive barriers to implementing multirisk assessment approaches into the DISASTER RISK MANAGEMENT decision-making processes, i.e. barriers related to how people perceive the problem of multirisk. Komendantova et al. (2016) presented the case of the 1995 Kobe earthquake in Japan, where the hazard was underestimated, simply because large earthquakes had been absent during the previous decades. Similar consequences are observed when building codes for earthquake-resistant structures are not followed, a problem that still exists all over the world, including in Europe. Individual cognitive barriers may only be overcome by raising awareness. Overcoming these barriers will require a long-term commitment on behalf of risk modellers and officials as well as strong partnerships for a 'stepby-step' approach to progressively implementing multirisk methodology into practice. 2.5.4 Conclusions and key messages Partnership A better integration of scientific knowledge of multirisk assessment into developing policies and practices will require a long-term commitment from both sides, science and practice, and building new partnerships between them. Such partnerships should enhance the knowledge transfer between science and practice and, among others, should help involve practitioners as well as their requirements in the scientific development of multirisk methodology at an early stage. Common efforts will be particularly necessary for simplifying existing methods for practical use. Furthermore, scientists are asked to provide practitioners with more scenarios demonstrating the added value of multirisk assessments in various situations, and together they should collaborate in establishing criteria for appropriate scenarios to be included in a multirisk assessment. More specifically, it might also be worthwhile considering the common development of a multirisk rapid response tool for assessing potential secondary hazards after a primary hazard has occurred. As lack of data is a crucial weakness in multirisk assessments, partnerships should also extend their collaboration to sharing data and building common integrated databases, in particular for demographic, socioeconomic and environmental data. Such partnerships could be realised with common projects or by creating so-called multirisk platforms for common methods and data, and/or establishing so-called local multirisk commissions, institutional areas with an interdisciplinary and multisector character for discussing and acting on multirisk issues. Knowledge Although a theoretical framework for multirisk assessment and scenario development is in place, there is still a need for further harmonisation of methods and particularly terms across the scientific disciplines.

3.3 Quantitative scenarios

More quantitative scenarios on present and future risks in a multirisk environment are needed, particularly with regard to potential indirect effects and chain-shaped propagations of damage into and within the socio - economic system. Such scenarios are still rare, mainly because of two reasons. First, the comprehensive databases needed for a multirisk assessment either do not exist, are not freely available or are insufficient; there is a need for establishing such databases between the disciplines. Second, quantitative fragility/vulnerability in - formation, in particular fragility/vulnerability curves and surfaces, respectively, have so far been developed only for a few specific cases, mostly related to the direct impact of a disaster, but hardly to its indirect consequences; these, however, in many cases may be more important than the direct ones. Therefore, the scientific knowledge base needs to be extended to quantitative vulnerability information, vulnerability curves and surfaces for indirect disaster impacts as, for in - stance, the loss in work productivity, loss of the functionality of systems and networks, costs of evacuation, costs of medial assistances and much more. Innovation A multi-risk modelling approach will be required in order to capture the dynamic nature and the various inter - actions of the hazard and risk related processes driven by both climate change and globalization. Moreover, solutions for risk assessments are needed that are no longer exclusively aiming at the best possible quantification of the present risks but also keep an eye on their changes with time and allow to project these into the future. The future challenges have two dimensions, one focused on empowering good decisions in practice and another on improving our knowledge base for better understanding present and future risks Developing an integrative model for future risk that considers not only the potential climate change-induced hazard dynamics, but also the potential dynamics of complex vulnerability components and the involved uncertainties will require the expertise of all these disciplines. A strong partner - ship will be required between the natural sciences, the social and economic sciences, as well as the climate change research community."

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Disclaimer. The present deliverable is drawn from:

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Where are we with multihazards, multirisks assessment capacities? Jochen Zschau, https://drmkc.jrc.ec.europa.eu/portals/0/Knowledge/ScienceforDRM/ch02/ch02_subch0205.pdf

Please refer to the above papers to have a detailed insight on the topic. We hereby declare that what reported below is entirely drawn from the above sources and that this deliverable is not in the position of proposing reliable multirisk plans, rather it intends to contribute to the discussion about the topic.