CapHaz-Net
Social Capacity Building
for Natural Hazards
Toward More Resilient
Societies

PROJECT FINAL REPORT

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Date of preparation of this report: 23.07.2012

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Declaration of the Coordinator

Coordinator declares and signs:

- Report represents an accurate description of the work
- Project has achieved or achieved most or failed its objectives and goals
- Public website is up to date
- Financial statements are in line with the actual work carried out
- All beneficiaries have verified their legal status

I, as scientific representative of the coordinator of this project and in line with the obligations as stated in Article II.2.3 of the Grant Agreement declare that:

- The attached periodic report represents an accurate description of the work carried out in this project for this reporting period;

- The project (tick as appropriate):
  X has fully achieved its objectives and technical goals for the period;
  o has achieved most of its objectives and technical goals for the period with relatively minor deviations;
  o has failed to achieve critical objectives and/or is not at all on schedule.

- The public website is up to date, if applicable.

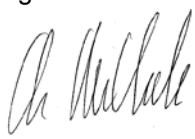
- To my best knowledge, the financial statements which are being submitted as part of this report are in line with the actual work carried out and are consistent with the report on the resources used for the project (section 6) and if applicable with the certificate on financial statement.

- All beneficiaries, in particular non-profit public bodies, secondary and higher education establishments, research organisations and SMEs, have declared to have verified their legal status. Any changes have been reported under section 5 (Project Management) in accordance with Article II.3.f of the Grant Agreement.

Name of scientific representative of the coordinator: Dr. Christian Kuhlicke

Date: 23.07.2012

Signature of scientific representative of the coordinator:



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1. Executive summary

The CapHaz-Net consortium developed a processual and actor-oriented understanding of social capacity building embedded in a framework of risk governance. Moreover, it identified and assessed existing practices and policies for social capacity building in the field of natural hazards across Europe. As its major policy-related outcomes, guidelines for local communities and risk management organisations as well as recommendations for activities to enhance the resilience of European societies to the impacts of natural hazards need to be highlighted.

During the course of CapHaz-Net it became increasingly apparent that organisations involved in managing natural hazards as well as residents and local communities exposed to natural hazards are increasingly confronted with new challenges and tasks they need to consider and address. This not only relates to the potentially growing risks associated with the occurrence of natural hazards due to, among other drivers, the consequences of climate change, demographic transformation and on-going urbanisation processes; it also relates to changing legislative frameworks and an increasing complexity of the management process itself. CapHaz-Net argues that this transformation of risk management into risk governance is a major trigger of the need to consider social capacity building at different scales more thoroughly in the future.

Therefore the CapHaz-Net consortium accomplished the following achievements:

- CapHaz-Net took into account relevant stocks of knowledge, expertise and experiences that have been published and debated in the discourses on capacity building, natural hazards and disasters, as well as recent discussions on climate change, in order to develop a comprehensive overview of the current state of social science research on natural hazards. It brought together different scientific disciplines and focused on synthesising and integrating knowledge and perspectives from well established fields of social science research (i.e. risk perception, social vulnerability, risk communication, risk education, risk governance and capacity building). Extensive literature reviews were conducted, its findings critically discussed and further expanded by interactive workshops and personal feedbacks from a wide range of scientists, policy-makers and practitioners from Europe and beyond.
- CapHaz-Net focused on how current social capacity building practices in Europe in regards to the management of natural hazards by considering different activities of both risk management organisations and local communities. Three so-called Regional Hazards Workshops were organised and accompanied by an intensive pre- and post-phase of communication with regional stakeholders. The workshops focused on the institutional settings and cooperation with regard to heat-related hazards in Southern Europe, social capacity building for alpine hazards and participation in flood risk management in Central Europe. Theses workshops allowed Caphaz-Net to down-scale existing knowledge gained during the first project phase and contextualise it within different risk governance settings in Europe.
- Based on the previous steps and insights, CapHaz-Net achieved to outline a strategy and develop specific recommendation framing social capacity building as a long-term process that starts early and should foster mutual and continuous participatory learning processes. Six principles structure this strategy, whereas theses principles are based both on insights gained through the extensive literature reviews and from the Regional Hazard Workshops. This strategy aims both at reducing the negative impacts of natural hazards as well as serving as a basis for improving the relationships between organisations involved in the management of natural hazards and local communities exposed to natural hazards. Furthermore, the principles serve as the basis for a guidance tool that allows for assessing existing social capacities as well as highlighting those that may need to be developed by organisations or communities. Additionally, recommendations were provided aiming at guiding future actions that encourage more resilient European societies in the face of natural hazards.

2. Summary description of the project context and the main objectives

2.1 Context

Capacity building is increasingly gaining relevance in efforts to reduce the impacts of natural hazards and disasters. At least, this is the impression the reader has when reviewing documents of international and national organisations aiming at reducing the devastating consequences of natural disasters. The Hyogo Framework for Action 2005–2015, for instance, promotes the decentralisation of authority and resources to promote local-level disaster reduction and acknowledges that for such a shift to take place, capacity building efforts are required. This includes, inter alia, to build institutional capacity and to build understanding and awareness about natural disasters (UNISDR 2005, 2011a and 2011b).

However, literature on capacity building efforts is predominantly related to the development context. It usually implies the transfers of knowledge and technology from the developed to less developed countries and more vulnerable parts of the world. In this respect, European countries are viewed as capacity builders. Yet, a look into the National Progress Report on the implementation of the Hyogo Framework for Action of the German Committee for Disaster Reduction DKKV reveals that European countries take up the notion of necessary capacity building (DKKV 2009). Thus, a major strategic goal for Germany is the "development and strengthening of institutions, mechanisms and capacities at all levels, in particular at the community level, that can systematically contribute to building resilience to hazards" (ibid., 4). To give another example: One of the most insightful European post-disaster reports in past years, the UK Pitt Review (Pitt 2008) particularly stresses the need of organisational capacity building at different levels, including the municipal level. These two examples imply that it is also necessary for Europe to enhance capacities in order to better prepare for, cope with and recover from the negative impacts of natural hazards.

This need is furthermore supported by the fact that authorities and organisations involved in managing natural hazards as well as local communities exposed to natural hazards are increasingly confronted with new challenges and tasks they need to consider and address. This not only relates to the potentially growing risks associated with the occurrence of natural hazards due to, among other drivers, climate change, demographic transformation and on-going urbanisation processes; it also relates to changing legislative frameworks (e.g. the EU Floods Directive; EC 2007) and, an increasing complexity of the management process itself. This creates new roles and responsibilities that communities at risk as well as organisations involved in the management process are expected to be able to deal with. The transformation of risk management into risk governance might be considered as a major trigger of the need to consider social capacity building at different scales. New actors, particularly non-state actors, including individual citizens and those from the private sector, are joining those with more established hazard management roles in the risk governance process. Although this process is not taking place evenly across Europe (Walker et al. 2010), it is possible to draw out some broad implications in order to highlight social capacities that need to be developed in order to encourage more resilient societies:

- A shift in the distribution of responsibility from state to local actors, and
- New tasks emerging for authorities and professional actors in the field of natural hazards management

2.2 Objectives of the CapHaz-Net project

CapHaz-Net's main objectives are to (1) identify and assess existing practices and policies for social capacity building in the field of natural hazards at all societal levels across Europe for elaborating strategies and recommendations for activities to improve social capacity building in order to enhance the resilience of European societies and communities to the impacts of natural hazards and (2) identify further research needs in these fields.

Based upon this, the specific objectives of CapHaz-Net were to:

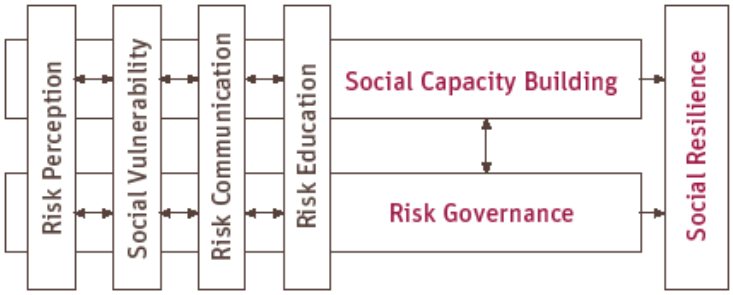
- develop a comprehensive and systematic overview of the current state-of-the-art of knowledge in the main fields of social-science research on natural hazards. CapHaz-Net therefore produced a structured know-how inventory for the topics outlined above by taking into account key studies, initiatives, best practices and legal tools;
- identify current gaps in the knowledge base as well as issues requiring multi- and interdisciplinary research;
- evaluate the contributions and relevancy of the above outlined themes for the creation of more resilient societies and communities by identifying and assessing existing practices and policies at different spatial scales across Europe;
- develop and apply a conceptual frame for institutional learning and transfer of existing knowledge and best practice into action. Therefore stakeholders and policy-makers are included in the main activities of CapHaz-Net to enhance and foster communication between the scientific community, practitioners and policy-makers;
- provide guidance and recommendations for further research and to improve future policy and practice in the field of natural hazards.

To reach these overall objectives, CapHaz-Net brought together knowledge and expertise from a range of different disciplines, examined and evaluated existing practices, projects, strategies and legal tools across Europe. The project was structured in three phases which took place over a three year period (2009-2012).

1. In a first phase, the project focused on synthesising and integrating knowledge and perspectives from six topics. These topics were identified beforehand as central for developing social capacities of organisations and communities for natural hazards. The work completed was structured along the following main research themes:
   - Risk Perception (WP 3) (Wachinger and Renn 2010)
   - Social Vulnerability (WP 4) (Tapsell et al., 2010)
   - Risk Communication (WP 5) (Höppner et al. 2010)
   - Risk Education (WP 6) (Komac et al. 2010)

   These need to be framed by paying attention to two overarching themes:
   - Social Capacity Building (WP 1) (Kuhlicke and Steinführer 2010a)
   - Risk Governance (WP 2) (Walker et al. 2010)

Figure 2.1: CapHaz-Net's thematic structure



During this phase key studies and initiatives were identified and assessed within each of the main topics, achieved through literature review work and thematic meetings. An extensive literature review was conducted to document the state of the social science research on natural hazards in Europe (and partly beyond). This was done by the respective work package (WP) leaders and in tandem with the consortium members. The literature review

was analysed and expanded upon through the means of three CapHaz-Net workshops. The themes of the workshops included (were):

- ⟶ Social capacity building and risk governance (Lancaster, UK, November 2009)
- ⟶ Risk perception and social vulnerability (Haigerloch, Germany, March 2010)
- ⟶ Risk communication and risk education (Ljubljana, Slovenia, June 2010)

In total 126 scientists, practitioners and stakeholders from 17 European and Non-European countries participated (including representatives of the EU) actively in the three CapHaz-Net theoretical workshops and, in doing so, considerably broadened our knowledge about existing studies far beyond the typical scope of English-written research. The main outcomes of this first period of CapHaz-Net are summarised in our "Knowledge Inventory" (Kuhlicke and Steinführer 2010b).

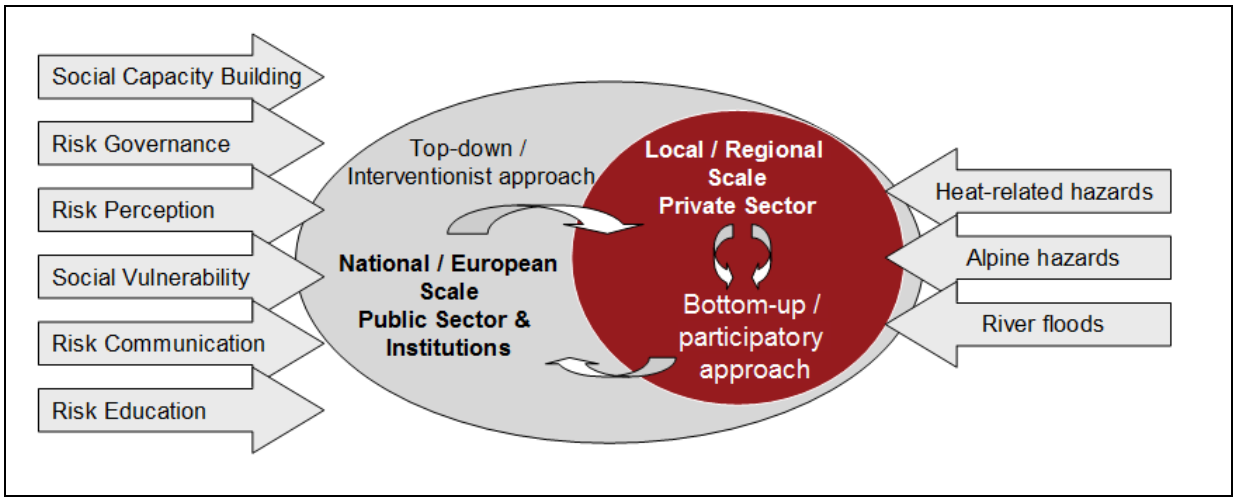
2. The second phase aimed at taking the results of the first phase of the project and applying them within particular regional contexts. Therefore, work packages 7-9 aimed at gaining a regional and hazard specific perspective through describing local experiences and existing practices and tools. CapHaz-Net aimed at better understanding of current social capacity building efforts in Europe in regards to the management of natural hazards by considering different endeavours and activities of both risk management organisations and local communities. This was achieved by assessing the lessons learned from three so-called Regional Hazards Workshops in different regional settings across Europe and with respect to different hazards. The themes of the workshops included were:

   - ⟶ Institutional settings and cooperation with regard to heat-related hazards (droughts, forest fires and heat waves) in Southern Europe (Barcelona, Spain, October 2010) (WP 7)
   - ⟶ Social capacity building for alpine hazards (Gorizia, Italy, April 2011) (WP 8)
   - ⟶ Participation in Central European flood risk management paying particular consideration to the European Floods Directive (Leipzig, Germany, May 2011) (WP 9).

   The practical workshops were made up of 130 participants from 12 different counties across Europe as well as participants from the USA and Australia. The aim of the workshops was to down-scale existing knowledge gained during the first project phase to different risk governance settings and regions across Europe by taking into account various natural hazards. Stakeholders from different backgrounds, including local and regional policy-makers, and scientists met to discuss existing practices, approaches and legal tools in European risk management.

3. During the final phase, the network integrated findings and developed recommendations that provide a synthesis and guideline which aim to assist the improvement of social capacity building in European societies' facing natural hazards as well as provided suggestions for future research.

Figure 2.2: Working structure of Caphaz-Net


Social Capacity Building
Risk Governance
Risk Perception
Social Vulnerability
Risk Communication
Risk Education
Top-down / Interventionist approach
National / European Scale Public Sector & Institutions
Local / Regional Scale Private Sector
Bottom-up / participatory approach
Heat-related hazards
Alpine hazards
River floods

3. Description of the main S and T results/foregrounds

This section provides a description and a summary of the findings of each of the work packages. It concludes by bringing all of these work packages together and presenting an overview of some of the results of these findings, as well as recommendations regarding how to improve social resilience.

Work Package 1: Social Capacity Building

CapHaz-Net understands social capacity building as a long-term process that starts early and fosters mutual and continuous learning. It is a process where information is made available and different types of knowledge are shared. Social capacity building is based on the cooperation and interaction of a variety of individual and corporative actors. It is aided by risk governance, better understood by assessing social vulnerability and risk perceptions, and realised through methods of risk communication and risk education.

Many international organisations have developed tools to assist in enabling capacity building. Among others, the United Nations, the World Bank, the World Trade Organisation and the International Monetary Fund consider capacity building as being central for their mission. They share a few things in common, such as the aim to assist people and institutions to develop skills, abilities, resources, and knowledge but also responsibilities to enable them to better adapt to and cope with a rapidly changing and increasingly complex environment. However, although the term 'capacity building' is to be found in such policy documents, there is still a great deal of debate centring on the question of what it actually might mean. To structure the debate, we therefore propose to distinguish in an (a) interventionist approach on the one hand, and a (b) participatory approach on the other. This difference is also utilised to elaborate relations to subsequent topics.

→ Interventionist approaches: The focus is on the public sector and organisations involved in the management of natural hazards. It aims at stimulating and supporting capacity building in specific sectors, localities, or regions by providing measures, strategies, and entire policy frameworks. An external institutional framework or organisation is hence set up in order to intervene and to initiate and promote endogenous processes; it is hence aiming at enabling social capacity building by including rules and norms "structuring the interaction" of people and creating the "power to achieve purposes that would be unreachable in their absence" (Scharpf 1989, 152) (see Kuhlicke et al, 2012).

Table 3.1: Advantages and possible limitations of interventionist approaches

Advantages
▪ Formulate measures, and strategies to support a certain idea (e.g. resilient societies) or participate in activities or sectors ▪ Provide a general frame aiming at assisting actors to rediscover, develop, and build different kinds of capacities ▪ May delegate responsibilities to adapt to and cope with a increasingly complex environment and stimulate transformation processes allowing adaptation to changing situations and requirements
Possible limitations and challenges
▪ Often entails a paternalistic stance, in the sense that an actor or a group of actors is considered by an outsider as lacking a certain skill, a resource or a capacity ▪ Often capacity building efforts are imposed on actors without their willingness to participate or agreement on deficits, methods and possible outcomes ▪ Focus is often on individual abilities and skills, while economic, political and institutional obstacles and barriers are neglected ▪ Involved actors may be underequipped (e.g. economically) resulting in a bias towards more powerful and better equipped actors

Source: Kuhlicke et al. 2012

→ Participatory approaches: The focus is on communities particularly. Such an approach aims at empowering actors by increasing their autonomy and agency to "develop their own self-confidence and skills to challenge prevailing local and wider structures of domination" (Pelling 2007, 375). Here the focus is on locally driven and locally owned capacity development processes.

Table 3.2: Advantages and possible limitations of participatory approaches

Advantages
▪ May stimulate self-help of communities and an increased autonomy of private actors and communities ▪ Actors and communities can determine their own values and priorities and preferred patterns of organisation without external pressures and aims
Possible limitations and challenges
▪ Difficult to find ideal balance between efficiency (controlling labour and time costs) and inclusiveness (expanding participation) ▪ Local elites may dominate the process as a result there may be a tendency for building the capacity of the powerful and less the capacity of disadvantaged or marginalised groups

Source: Kuhlicke et al. 2012

Three further key insights derived from WP 1 (Kuhlicke and Steinführer 2010a).

→ Social capacity building is a multi-actor process, this includes, among others:

- *Residents at risk, actors from the voluntary sector as well as private actors* (e.g. local companies). Local communities might be independent territorial units or parts of larger settlements, such as neighbourhoods within a city.
- *Organisations and authorities* involved in managing natural hazards (e.g. municipal or regional authorities, hazard protection agencies, ministries etc.) which include both specialised entities as well as organisations that also have other responsibilities (e.g. regional planning agencies). These organisations and authorities are not only developing other actors' capacities but potentially need capacity development themselves.

→ *Social capacity building is an iterative learning process*: Social capacity building should be seen as an iterative learning process which needs to take into account different stocks of knowledge and experience as well as different kinds of expectations. It should be organised as a learning process that recognises and takes into account the mismatch of expectations and actual results; that is to reflect and if appropriate adapt established practices, norms and policies. Such attempts may even lead to questioning the very basis of practices, norms, structures and cultures of the entity of interest itself as well as the context of actors and structures involved.

→ *Social capacity building is a truly participator process*: Social capacity building needs to pay particular attention to the interrelation of capacity builders and those lacking capacities. Attempts at building capacities always face the potential problem of taking a paternalistic stance, in the sense that an actor or a group of actors is considered by an outsider as lacking a certain skill, a resource or a capacity. Capacity building is quite often applied "by donors to recipients" whereas the need for capacity building is defined by external actors. The weakness of this 'deficit model' is that it pays no attention to the capacity of institutions to overcome inherent barriers to engagement. This is surely a central challenge of social capacity building for natural hazards: Who defines based on which (empirical) grounds, who is lacking what kinds of capacity, by which means or processes capacity should be improved (with which resources, which actors involved) and what should the outcomes look like?

Figure 3.1: Elements involved in social capacity building for natural hazards – reconsidered

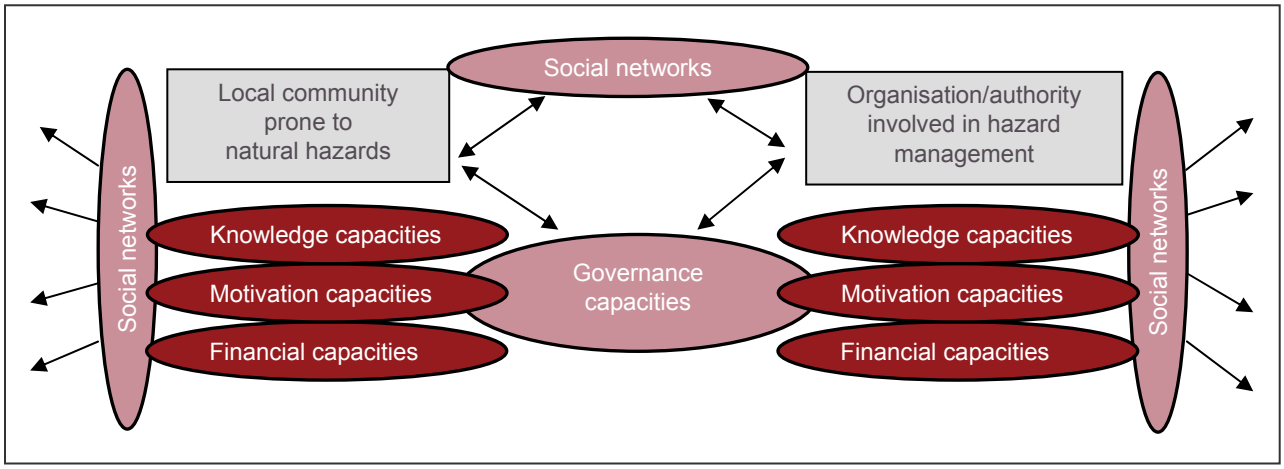
Source: authors' considerations; design: annalogie.de

→ *Social capacity building needs to consider different kinds of capacities*: Based on a thorough literature review as well as the input of participants in different workshops, a typology was developed outlining five different types of social capacities (Kuhlicke and Steinführer 2010b, Höppner et al. 2010). These are knowledge, motivation, social networks, financial resources and governance capacities (see also Fig.3.2):

- *Knowledge* comprises different types of knowledge. These are available in different forms and degrees of codification. This capacity thus includes both formal (e.g. written-down) and non-codified (e.g. local) knowledge.
- *Motivation* relates to the general willingness to take notice of and deal with natural hazards. In this understanding it includes awareness, responsibility and ownership. As a means to establish or trigger risk-related motivations, emotions (e.g. due to previous disaster experience), incentives (e.g. co-funding for hazard-proof buildings), interests (e.g. because of property in risk areas) and trust (in authorities or other members of community) were identified.
- *Social networks* relate to the possession and exploitation of social capital which describes the "aggregate of the actual or potential resources which are linked to possession of a durable network of more or less institutionalised relationships of mutual acquaintance and recognition" (Bourdieu 1986, 248). In CapHaz-Net's conceptualization social networks are considered to be a key social capacity as they might be elicited as transmitters of all other capacities. Furthermore, they are used in interactions among and between communities and organisations. Yet, social networks should not be romanticised, as they not only contribute to internal cohesion but might also lead to fragmentation (such as sub-networks, for example).
- *Financial resources* include incentives, public and private funds as well as insurance policies. There is a strong link to governance capacities as financial resources are often related to issues of distribution, transparency and perceived justice/injustice.
- *Governance capacities* relate to participation opportunities and fair governance. Across Europe we find a highly diversified governance landscape in risk management (e.g., strong vs. weak, paternalist vs. non-paternalist approaches).

These social capacities are either owned by an individual, an organisation or a community (knowledge, motivation, finances) or these actors have access to them (social networks, governance capacities). Governance capacities are considered to be a key resource to enable interactions between private and institutional actors (such as local communities and organisations). Social networks, then, are transmitters of knowledge, motivation and financial capacities and establish links among and between local communities and organisations and beyond (figure 3.2).

Figure 3.2: Types of social capacities in local communities and organisations and their relationship



Source: authors' considerations

Work Package 2: Risk Governance

CapHaz-Net understands risk governance as a concept that encompasses a number of formal and informal social arrangements and procedures with respect to natural hazards, which change over time. They constantly redefine the relationships between state institutions and civil society in this field.

There is a great consensus in the scientific literature that natural hazards need to be dealt with by multiple actors of the society at multiple levels. As such, democratic institutional and regulatory frameworks need to be set up which aim to meet to needs of all members of society. Such an approach requires participation in order to understand the attitudes and relations between different types of actors and, thus, rather distinct interests and power potentials. CapHaz-Net started to map different policy approaches in risk governance in different European countries as they range widely across the continent. Wider changes in society and in ways of conceiving, organising and structuring the coordination of societal objectives inevitably shape the manner in which natural hazards are dealt with. In a general sense, a broad shift is taking place in regards to how societies are governed. This is also relevant to the handling of natural hazards as it is to other societal concerns such as crime, housing, economic regeneration or transport. Although these shifts are expressed in different ways across Europe, two broad changes were identified throughout the CapHaz-Net project:

→ *Changing distributions of responsibility*: The formerly largely linear chain of command has given way to a more complex structure based on networks, as subnational organisations communicate directly with supranational organisations, such as the European Union, and vice versa in the field of natural hazards management. Although the management of natural hazards has always involved multiple actors beyond the public sector, a recent shift towards a greater diversity of actors and the development of new roles and stronger forms of collaboration has been noted (Walker et al. 2010). While this shift may also result in new forms of authority and control as well as a possibly changing distribution of responsibilities, for Rosenau (2004), this new governance is still about the exercise of authority, but through employing a broad range of strategies, including shaping people's shared norms and habits, informal agreements, negotiations, etc. These shifts are also partially reported with regard to natural hazards, as it is increasingly acknowledged that pure technical or structural solutions along with the demand for an 'absolute protection' against the negative impacts of natural hazards are not achievable (which is, for example, mirrored by the Strategy Natural Hazards in Switzerland was developed by PLANAT and published in 2004. In several European countries, public strategies of 'Making Space for Water' (UK; Defra

2005) or 'Ruimte voor de Rivier' (Netherlands; PKRR 2006; additionally for Poland see Begg et al. 2011, 46) as well as policy initiatives which attempt to encourage householders and businesses to make their buildings more resistant and/or resilient to floodwaters highlight such shifts. Similar changes are also taking place in relation to the problem of water scarcity, as the CapHaz-Net workshop in Barcelona on heat-related hazards revealed (Suprmaniam et al. 2011). In these ways, those at risk – residents, businesses, farms, infrastructure managers, etc. – are gradually transformed into risk managers and active participants of the multi-scale risk governance network as they are encouraged or even required to take more responsibility for their actions. This process of "responsibilization" (Garland 1996) and "privatisation of risk", respectively (Steinführer et al. 2008), includes attempts to define these actors as agents that need to take decisions and choices with regard to the prevention and mitigation of hazards. However, as the examples in Table reveal, this process is not taking place with the same intensity across Europe.

Table 3.3: Different degrees of responsibilization in selected European countries with respect to flood risks

Germany	England	Italy	France	Slovenia
Demanding	**Encouraging**	**Encouraging**	**Not expected**	**Not expected**
Citizens in areas prone to flood hazards are obliged to take adaptation measures in accordance with their possibilities and abilities.	Flood policy actively encouraging householders and businesses to be prepared and to increase their resilience.	Citizens share responsibility for civil protection activities with a number of public actors.	Citizens are not encouraged to reduce their vulnerability.	Citizens are not encouraged to reduce their vulnerability.

Source: Walker et al. 2010

→ *New tasks in natural hazard management:* Increasingly during the last two decades, a shift from attempts to control nature and protect citizens from the impact of natural hazards towards more integrated management approaches can be observed in many countries across Europe. This also creates new tasks and challenges for authorities and professionals involved in the field of managing natural hazards.

- A more comprehensive approach to natural hazards assessment is required. This approach should consider not only the hazard itself but also other dimensions such as the vulnerability of people, buildings and infrastructure, as well as prevention and mitigation options and strategies that are still adaptable and resilient to uncertain future developments.
- A participative decision-making approach to natural hazards is required. Risk governance is often equated with the idea of "good governance". Tompkins et al. (2008) associate good governance of disasters with stakeholder participation in decision making, democratic access to knowledge as well as transparency and accountability in relation to policy decisions. Further principles highlighted are openness, effectiveness, coherence and fairness. Meanwhile, a number of policy documents explicitly refer to the idea of 'good governance' (Defra 2005, PLANAT 2008, IRGC 2009). The European Floods Directive (2007/60/EC), for instance, encourages Member States to involve "interested parties" within the development of flood risk management plans (EC 2007, Article 10). However, the exact definitions and guidelines regarding how one should go about participation (i.e. who should be involved and how) are not clearly prescribed by the Directive, instead this is a task of each Member State.
- The management of natural hazards requires continuous communication with a multiplicity of actors. Merz et al. (2010) state with regard to flood risk management: "The increasingly prominent role of non-structural measures requires a much larger involvement of the public, and a functioning dialogue on the flood risk and mitigation options is an essential element of an integrated flood

risk management" (ibid., 522). The task of risk communication has thus become more challenging and more complex. The increasing number and diversity of actors that are perceived to have a legitimate stake or right to be involved in risk management and governance comes with multiplying expectations of how risk communication should be enacted and what it should ideally achieve (Höppner et al. 2010). Risk communication has been enshrined as a fiduciary responsibility of official bodies in a number of European and international policy documents and translated into national law and regulation, though to varying extents across countries. It is important to note that although guidelines on the communication of technological, chemical, food and health risks have emerged, there is hitherto no generic document that specifically sets out legal requirements or recommendations for the communication of natural hazards at the European level (Höppner et al. 2010).

The consequences of such changes in governance and the new challenges that natural hazards pose are manifold and can hardly be summarised here. However, they have immediate implications for any attempt to build social capacities for natural hazards. This implies, for instance, the need to employ good practices of risk communication and to establish trustful relationships between and within organisations as well as between organisations and the public, to handle the increasing complexity of the management process itself and to identify and handle new responsibilities and duties that emerge out of these governance changes. Table 3.4 attempts to draw together some of the key features of this 'new' risk governance by considering the possible positive and negative ways in which these features may materialise in the governance of natural hazards.

Table 3.4: The implications of shifts to governance for the governance of natural hazards

	Governance of natural hazards	**Potential positive implications**	**Potential negative implications**
Networks of multiple actors beyond the state	Government agencies, private sector utilities, businesses, community groups, householders	Different voices are heard; different skills, knowledge and capabilities are drawn on; better communication and coordination	Unclear accountability; illusion of involvement; tokenistic inclusion; slow decisions and compromise solutions
Multi-level governance networks	International agreements; cooperation between nations; regional and local networks	Greater flexibility, sharing of skills and resources; more cooperative solutions between levels	Unclear distribution of responsibilities; conflicts between scales; disaster capitalism
Diverse forms of control	Communication and persuasion; use of market mechanisms; regulation of private companies	More effective and efficient ways of achieving policy objectives	Reliance on market mechanisms disadvantages those with fewer resources; fragmentation and ineffective regulation
Distributed responsibility	Sharing of responsibilities with private sector, NGOs and individuals	Empowerment; more effective action; local decision making; more resources	Unclear responsibilities; fragmentation of policy making and policy implementation; under resourced and marginalised groups may become more vulnerable

Source: adapted from Walker et al. 2010

In order to utilise these findings CapHaz-Net has developed a framework which enables the assessment of the state of structures of governance that exist in a given country. This framework enables:

- → Any chosen national, regional or local natural hazard governance context to be profiled against a set of eight governance characteristics
- → Positioning of the current situation for each governance characteristic along a spectrum

→ The direction and strength of past and expected future change either towards or away from the present situation to be indicated

The eight governance characteristics cover key matter of:

→ Governance level and scale (national, regional and local)
→ How much those at risk are expected to be responsible for protecting themselves
→ The culture of stakeholder participation in the governance system,
→ The type of insurance provision in place
→ The extent of public risk communication
→ The balance between governance tasks and available resources

These provide a set of broad characteristics that can be applied in a generic way for different hazards. Table 3 provides an example of how this assessment can be applied.

Table 3: Flood risk in the UK, 2012

Strong national policy framework	Weak national policy framework
Strong role for regional institutions	Weak role for institutions
Strong local/municipal role	weak local/municipal role
Major responsibility on those at risk to protect themselves	Minor responsibility on those at risk to protect themselves
Strong culture of multi-stakeholder participation	Weak culture of multi-stakeholder participation
High reliance on segmented and marketised insurance	Low reliance on segmented and marketised insurance
Extensive public risk communication	Very little public risk communication
Good balance between governance tasks and available resources	Imbalance between governance tasks and available resources

Source: Walker and Tweed, 2012

Work package 3: Risk Perception

The research field on risk perception is well established within the social sciences. However, it focused so far on technological risks and on the underlying heuristics, values and assumptions that lead to more or less acceptance of novel technologies. There is still a major research need with regard to natural hazards and how individual, social and cultural determinants influence natural hazard perception.

CapHaz-Net collected around 30 risk perception studies from Europe that were conducted over the last decade in order to figure out those factors found which influence people's risk perception

most (an overview of these studies is to be found in Wachinger and Renn 2010). Out of the studies considered, only a few of them draw valid comparisons across the whole range of natural hazards. In addition, these studies differ in approach and test design. Most of the studies focus on floods but some include avalanches, mud slides, volcanic risks and heat waves. They all have in common that the perception of the natural hazard is linked to potentially influencing factors. These factors can be divided into four groups: risk, informational, personal and context factors (Table.5).

Table 3.5: Tested risk factors in risk perception studies in natural hazards research

Groups of factors	Factors
Risk factors	Perceived likelihood of an event, perceived or experienced frequency of hazardous event
Informational factors	Source and level of information, media coverage, involvement of experts in risk management
Personal factors	Age, gender, educational level, profession, stakeholder membership, personal knowledge, personal disaster experience, trust in authorities, trust in experts, confidence in different risk reduction measures, involvement in cleaning up after a disaster, feelings associated with previously experienced floods, world views, degree of control, religiousness
Context factors	Economic factors, vulnerability indices, home ownership, family status, country, area of living, closeness to the waterfront, size of community, age of the youngest child

Source: Wachinger and Renn 2010

Although the limited number of 30 studies does not allow representative inferences, this sample is sufficient to explore the most important factors and to discuss their significance for risk perception (cf. Wachinger and Renn 2010).

- *Risk factors* do not play a very important role in the risk perception of natural hazards. The likelihood of a disaster is barely taken into account when making judgments about perceived risk levels. The perceived magnitude of a disaster is also of little importance for people's risk perception. This is surprising since catastrophic potential is a rather strong predictor for risk perception in the field of technological risks.
- *Informational factors*: The type and source of information has been shown to have a significant though low impact on risk perception. However, much of this impact could be explained by differences in the perceived trustworthiness of the authorities providing the information. Information provided by the mass media shapes risk perception to some degree but if persons report that they have had personal experience with hazards media coverage does not play a major role. However, media reports about an expected flood can stimulate people to recall the previous experience of a flood event.
- Most of the *personal factors* tested in the studies show little to no significant influence on risk perception. Most studies did not find any age-dependency. A similarly ambiguous situation exists with regard to gender. Women rate flood risk as more serious than men. They also seem to be more worried about volcanic risks. However, when these effects were controlled for hazard-experience, gender did not make any difference. Lastly, the educational level of the respondents had hardly any influence on risk perception.
- Several studies were able to demonstrate that *experience* is a significant and strong predictor for risk perception. Positive or negative feelings associated with personal flood experience were found to have different effects on perception and preparedness intentions: negative feelings associated with previous experience decrease trust in official flood protection measures and increase risk perceptions while positive feelings increase trust in authorities and decrease risk perception. Risk perception and risk awareness reach high levels directly after a flood event, but soon fade away over time and approximate average levels. It seems to be essential to help people recall the

experience of the flood if one wants to motivate them to take protective actions against a new flood.

- ⟶ In addition to personal experience, the second most important factor for risk perception of natural hazards seems to be *trust in authorities and confidence in protective measures*. The influence of trust on risk perception has been extensively studied in the context of risk preparedness. Trust in flood protection, for example, lessens perceptions of flood likelihood and magnitude and, through this route, reduces intentions to prepare for floods. These different effects of trust on risk preparedness as shown in the two studies may be due to differences in political culture and different experience with authorities in general.
- ⟶ *Context factors* are routinely investigated but they are often conflated with personal factors. For example, personal flood experience is often documented as an intervening variable for explaining regional differences in flood risk perception. Many studies show that the perception of flood risks depends on the place of residence (areas with frequent floods versus rare floods).
- ⟶ *Economic factors* do not seem to play a significant role in risk perception, with the exception of home ownership.

The findings of risk perception studies (cf. Wachinger and Renn 2010) have implications for risk governance, risk communication as well as social capacity building in general as through the broader governance shifts a greater responsibility is put on actors from the private sphere as they are increasingly encouraged or demanded to individually reduce the potentially damaging consequences of a natural hazards. However, findings from risk perception studies clearly underline that the awareness of a hazard does not necessarily translate into preparedness or concrete actions. The findings rather underline the relevance of the experience of hazardous events as well as the trust in authorities and measures as factors influencing risk perception. This finding suggests some important implications for any social capacity building effort: A possible information campaign, for instance, will only be successful if it is based upon trusting relations between residents and the authorities providing information. Therefore, the development of trust-building strategies is a crucial part of the capacity building process.

Work Package 4: Social Vulnerability

Social vulnerability studies aim to identify and understand why certain groups of people may be more exposed, more sensitive, and / or have less capacity to adapt to and cope with the impacts of natural disasters than other groups.

It is not the height of the flood or the intensity of the earthquake but the social context in which these events occur that we need to understand in order to be able to appreciate the true consequences of hazard events. Moreover, improving risk reduction and disaster preparedness for natural hazards requires the identification and assessment of various vulnerabilities of individuals, societies, economies, institutional structures, and environmental resource bases.

Social capacity building efforts should target both (external and internal) sides of social vulnerability: the external side by working towards an overarching form of risk governance; and the internal side by focusing on educating, improving the level of perceived risk, building motivation, and a sense of individual responsibility within communities to manage and mitigate their own risk. Moreover, the question of “who defines what on which ground?” is key to any vulnerability assessment. People’s vulnerability needs to be seen in light of their capacities to influence and define their own fortunes. Appropriate bottom-up and top-down approaches need to be contextualised and explored.

Furthermore, there are different types of vulnerability assessments: taxonomic-deductive and participatory-inductive approaches (Wisner et al. 2004, Wisner 2005, Pelling 2007). Both approaches follow different aims and purposes that rely on different methods, focus on different spatial levels, and allow different degrees of participation:

→ *Taxonomic, deductive vulnerability assessments*: Such assessments aim at identifying areas, groups or sectors with the greatest needs (i.e. a high level of vulnerability) by relying on different indicators and indices. The underlying hypothesis of such assessments is the existence of a strong positive correlation between socio-economic and/or demographic status and vulnerability. There have been many different indexes developed over the last decade. The spatial level may go from the level of neighbourhoods, to the local, regional, national and international level. One purpose is to identify vulnerable areas to set priorities and develop intervention measures and strategies aimed at reducing the vulnerabilities of areas or population groups with the greatest needs; it is hence policy oriented.

Table 1.6: Strengths, possible limitations and challenges of taxonomic, deductive vulnerability assessments

Strengths
Puts the issue of social vulnerability on the public agenda and into the "heart of government thinking"
Provide information for strategies measures and plans
Provides simple and understandable information and allows comparison of the vulnerability of specific areal units (e.g. locality, regions, nation states)
Possible limitations and challenges
Often fail in that they produce too many 'false positives', as, for example, not all elderly people are equally vulnerable throughout the entire risk cycle
Mostly rely exclusively on statistical (e.g. census) data or on the use of quantitative techniques neglecting the local/regional context
Challenge of down-scaling the assessment as many national-level assessments can result in loss of information and capturing local pockets of variability
In the European context there is a lack of empirical studies of social vulnerability hampering the validation of indices and indexes

Source: Kuhlicke et al. 2011

→ *Participatory, inductive vulnerability assessments*: Such assessments aim to better understand actors' perceptions of their own vulnerabilities and capacities in order to identify and strengthen various forms of capacities and to raise awareness on the local or regional level and, finally, to develop locally embedded and applicable adaptation and coping measures. As they follow an inductive approach such assessments do not have a clear hypothesis in mind but rather provide the space to allow actors to develop definitions of their own vulnerabilities and capacities. There have been many different techniques developed and applied during decades such as Participatory Rural Appraisal (PRA), Participatory Action Research (PAR), 'sustainable livelihoods' (SL) (e.g. Chambers 1983, Chambers and Conway 1992, Winchester 1992, Moser 1998, Cannon et al. 2003), community or citizen-based risk assessments (Wisner 2006), as well as participatory disaster risk assessment (Pelling 2007). They have so far mostly been applied to non-European cases.

Table 3.7: Strengths, possible limitations and challenges of participatory, inductive vulnerability assessments

Strengths
Actors can identify and assess their own vulnerabilities and capacities Allows the integration of local stocks of knowledge, experiences, and perceptions into the assessment Makes different and possibly conflicting views and opinions apparent and allows mutual learning processes
Possible limitations and challenges
Up-scaling is a challenge as results are dependent on the definition context and therefore, making comparison and aggregation across locations difficult

Source: Kuhlicke et al. 2011

→ *Integrating taxonomic and participatory assessments*: Recently, attempts were made at integrating taxonomic and situational approaches which allow for cross-location or cross-regional comparison but are still context-sensitive (Kuhlicke et al. 2011). Similarly, Kolkman et al. (2005; 2007) advocate a frame reflection and mental model mapping technique to enable mutual understanding between decision-makers, experts, and stakeholders. Burgess et al. (2007) propose a deliberative mapping methodology to engage experts and citizens in an interactive dialogue on problem framing and option definition that might be adopted for the appraisal of natural hazard risks. Kenyon (2007) and Scolobig et al. (2008) have recently presented participant-led multi criteria approaches for evaluating flood mitigation measures.

Work Package 5: Risk Communication

Risk communication can be broadly defined as exchange of risk-related information between decision-makers, experts, stakeholders, and the affected public. However, in reality, risk communication is more complex, as it occurs between different spatial scales, between a multiplicity of societal actors, for varying purposes and through various tools and channels – making communication research and evaluations particularly challenging.

Little empirical knowledge is available on the effect of risk communication in regards to social capacity building. What is more, there is hardly any active reflection on what capacities are actually needed and to what extent. The bulk of relevant literature refers to technological or health risks. Moreover, empirical findings on the effects of one-way risk communication (for example, flyers or information campaigns) suggest that while such communication efforts often are successful in raising risk awareness and in increasing risk-related knowledge, their effects on people's actual risk preparedness and emergency behaviour are very limited. In addition, two-way, dialogue-based risk communication, however, appears to enhance trust in authorities and the mutual understanding between experts and local stakeholders which provide a valuable basis for more effective one-way risk communication. CapHaz-Net conducted a review of 60 risk communication practices in 16 European countries (see Table 3.8).

Table 3.8: Inventory of risk communication practices

Number of practices:	60
Countries:	16
Hazards:	40 floods, 8 debris flows, 7 landslides, 6 storms, 5 heatwaves, 4 snow avalanches, 4 storm surges, 3 rockfalls, 3 droughts, 3 earthquakes, 2 rock avalanches, 2 forest fires
Spatial level:	24 local, 13 national, 8 national-regional, 6 regional-local, 4 national-regional-local, 3 regional
Communication mainly serves to:	46 provide information, 22 warn of events, 12 train emergencies, 11 forecast events, 10 implement non-structural measure (6 land-use planning, 4 risk/hazard maps), 8 develop non-structural measures (7 land-use planning, 1 risk/hazard map), 7 implement structural measures, 7 develop structural measures, 2 develop warning systems

Source: Höppner et al. 2010

The results of this explorative analysis of communication practices can be summarised as follows:

→ There are only a few 'best practices' that comprehensively apply lessons and guidelines from the risk communication literature, e.g. that communication should be based on the needs of the audience. Hence, we can conclude that there is a considerable gap between the theory and practice of risk communication on natural hazards in Europe.

→ We furthermore found that particularly at the national and regional level one-way communication with stakeholders and the public dominates. Two-way communication practices were largely limited to the local level and were found in the context of floods but hardly for any of the other natural hazards CapHaz-Net is concerned with.

→ The bulk of communication practices aims at informing the public (on hazard, risks, mitigation and prevention measures, how to behave in the case of an event, and to promote acceptance), raising awareness, triggering protective action, and warning of upcoming events. Only few practices explicitly consider relationship management, outrage management, the preparation for adverse psychological/emotional effects, keeping memories alive, mutual understanding and learning as explicit objectives of communication. Or, from the perspective of social capacity building, the bulk of communication practices aim at developing knowledge capacities and attitudinal/motivational capacities (e.g. awareness) rather than at fostering social/organisational and psychological capacities.

→ Most of the reviewed communication practices include good or innovative tools that could be combined to produce more comprehensive and effective communication strategies. Indeed, while many promising tools are currently being trialled in Europe, they are often disparate and not embedded in long-term communication plans.

In line with the basic differentiation of social capacity building in interventionist approaches on the one hand, and participatory approaches on the other, CapHaz-Net distinguishes between (a) information provisioning communication measures and strategies and (b) information seeking and/or dialog-oriented communication measures and strategies, with regard to risk communication (Höppner et al. 2010). Both approaches follow different aims and purposes and rely on different channels and tools.

→ *Information providing communication*: Such communication measures and strategies may have many different purposes such as: raising awareness, encouraging protective behavior, or warning residents at risk. What they share is that they are mostly developed and implemented by a responsible public organisation. Such communication measures or strategies are indirect, one-way communication with no feedback mechanisms. The relevance of this dimension of risk communication is underlined by the Hyogo Framework for Action 2005-2015 as governmental organisations should "provide easily understandable information and disaster risk reduction and protection options, especially to citizens in high risk areas, encourage and enable people to take action to reduce risks and build resilience"[1]. Yet, this dimension should not only relate to providing easy accessible information about natural hazards, it should also include the task of providing information about legal and regulatory systems.

Table 3.9: Advantages and possible limitations of information providing communication

Advantages
Cost-effective and low transaction costs
May be a necessary and quite efficient way of warning actors about an immediate possible crisis in order to stimulate a prescribed behaviour
Possible limitations and challenges
Seems to have a positive effect on awareness, but hardly any effect on behaviour, learning and active engagement
Cannot overcome the expert/lay dichotomy and hence the view that risk communication is mostly about information transfer
How to bring together the instrumental side of risk communication with normative (e.g. the right to be involved on the grounds of democratic emancipation) and substantive rationales (contribute values, perspective and values)?

Source: Kuhlicke et al. 2011

[1] http://www.unisdr.org/eng/hfa/docs/Final-report-conference.pdf

→ *Dialogic versus non-dialogic communication processes:* Such communication measures and strategies may also have different purposes such receiving feedback on certain measures and strategies, looking for relevant information which are missing, enabling mutual exchange, understanding and learning, building and improving trust and relationships, or engaging actors in an interactive and open appraisal and assessment processes. Such communication measures or strategies are set-up in two way communication forms and this either in a non-dialogical, information seeking/consulting manner, or in a dialogical manner. Information seeking communication aims at receiving some kind of feedback for reassuring, for instance, that previously provided information is understood and taken up. Dialogical communication aims at open and mutual exchange and allows, among others, the identification of different or similar opinions, views, worldviews and values among and between different actors.

Table 3.10: Advantages and limitations of dialogic communication

Advantages
Seems to have positive influence on risk perception, behaviour, engagement and social and mutual learning.
Acknowledges the relevance of underlying values and norms and aims at gradually eliciting and exchanging these values.
Increases trust in governing organisations and improves relationships and achieves wider acceptance of measures and hence reduce conflicts and improves mutual understanding.
Possible limitations and challenges
Practicability, given time and financial constraints in management practice.
Sense of responsibility of the stakeholders/the public

Source: Kuhlicke et al. 2011

→ *Complementary communication strategies*: In recent debates, trends have been towards combining single approaches to benefit from their respective strengths and ultimately to increase the effectiveness of risk communication (Höppner et al. 2010). Attempts to conceptualise different approaches as complementary rather than mutually exclusive are remarkable given that the past has been rich in tensions between some of the outlined approaches. These tensions stem from seemingly fundamentally different assumptions regarding the nature of risk, human rationality, and the purposes of risk communication. Instead of focusing on single risk communication actions, recent research findings suggest to shift to long-term risk communication strategies based on reflections on the context (Höppner et al. 2010).

Work package 6: Risk Education

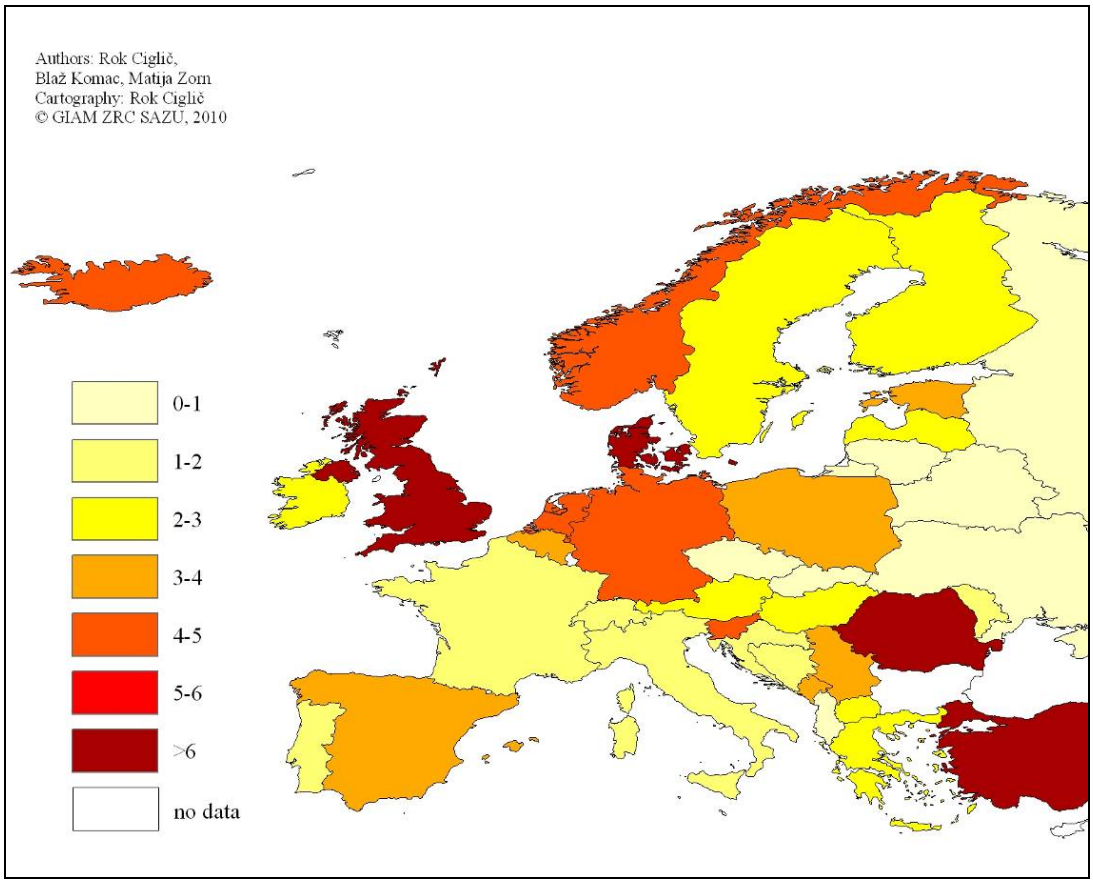
In recent policy documents, it is widely agreed that education for disaster reduction must become an integral part of any educational strategy aimed at promoting and creating thriving and sustainable societies. However, in general, the social dimensions of natural hazards are rare in European risk education; support from research is needed for changes in this regard. In future, studies should further investigate if and how risk education influences risk perception, social vulnerability and behavioural changes. Currently there is a lack of evaluation and research in the field of (school) risk education in Europe. Therefore, there is lack of knowledge about the efficacy of risk education (transmission of knowledge, skills).

Therefore an explorative study on current risk education with a special focus to curricula and textbook research was conducted: In the following some of the findings from our review of 166

textbooks and more than 37,000 pages from thirty-five European countries are presented. The analysis provided an insight into the current situation in various countries, in which attention must be drawn to the fact that the textbooks selected naturally do not represent the only possible selection because it was impossible to examine all the textbooks and also because the institute does not have all of them. The majority of the textbooks were regional geographic (36%), about a fifth (23%) were more physical-geographic while 42% were social-geographic.

Both with regard to the single European countries (Figure 3.3) and to different European regions at a large scale, a highly differentiated risk education landscape becomes obvious. Western Europe dedicates the most attention to natural hazards (5.2%), and Eastern Europe the least (0.7%). The share of pages containing descriptions of natural hazards is still above 3% in Northern Europe (3.6%) and South-eastern Europe including Turkey (3.4%). The shares in Central and southern Europe exceed 2% (2.8 and 2.3%, respectively). There are certainly many reasons for these differences. Among them, we suggest the political division of Europe after WWII and the distinct world and nature views related to the different regimes as well as persistent welfare differences as being important.

Figure 3.3: Natural hazards as course content expressed in the share of pages in European secondary-school geography textbooks**.**



Source: Komac et al. (2010)

Nearly 1,000 pages (i.e., 966) or four-fifths of the total pages in the textbooks covering natural hazards are dedicated to descriptions of natural hazards. The largest share is dedicated to earthquake descriptions (23%), and more than one-fifth (21%) of pages focus on describing volcanoes as generators of volcanic hazards. These are followed by descriptions of floods (18%) and, surprisingly, erosion (14.5%). The share of other natural hazards mentioned in textbooks is below 10%. Fairly large attention is directed to landslides and rockfalls (8%), and storms (7%), whereas droughts (3.5%) and avalanches (2.5%) are dealt with less often. Descriptions of wave surges and tsunamis (1%) are even more frequent than descriptions of forest fires (0.8%), although forest fires are quite common in southern Europe, for instance.

The textbooks are furthermore suggestive of the impression that natural hazards are less common in Europe than 'elsewhere' in the world, because examples from non-European regions predominate. For example, floods are in a number of European textbooks presented by the case of Bangladesh although monsoon floods can be rather different than lowland or torrential floods in Europe. This imbalance toward non-European hazards and disasters, respectively, is perhaps due to the fact that out of Europe disasters are more 'spectacular' or cause higher levels of casualties and economic damage, and are therefore more often reported in the media.

In spite of its explorative character, the textbook analysis brought about that the 'European risk education landscape' is far from uniform. However, a number of textbooks do not cover the topic accordingly – either at all or in its European dimensions or in covering the social aspects alongside the physical ones. On the other hand there are many good examples of textbooks from methodological and contents' perspective (for details see the WP 6 report; Komac et al. 2010).

Generally, risk education, with respect to natural hazards, is a genuine social capacity building effort which includes all age groups and goes well beyond mere dissemination of knowledge. It also includes capacity building on a motivational and procedural basis, as teaching always includes the notion of 'learning to learn'. To start with in this rather poorly developed research field, CapHaz-Net has a major focus on formal education, the curricula and materials used there. This can be justified, among others, by the fact that children and teenagers are mostly not part of risk management exercises and formal participation processes. Yet, within compulsory institutional settings (what schools typically are) they can be easily addressed. Moreover, children and teenagers are also important transmitters of risk-related knowledge to parents, other children etc. However, risk education is by far not restricted to formalised schooling, but rather includes a wide range of arenas, tools, actors, and materials within the broad field of Education for Sustainability (EfS).

In line with the basic differentiation of social capacity building in interventionist approaches on the one hand, and participatory approaches on the other, CapHaz-Net distinguishes between (a) curriculum based, standardised education as well as in (b) participatory and locally embedded education, with regard to risk education

→ *Curriculum based, standardised education on natural hazards*: Such modes of education are based on a clearly defined and prescribed curricular specifying relevant stocks of knowledge to be transmitted within specific subjects, measurable steps, outcomes, and aims. They are embedded in the larger education systems. Its overall conditions are constructed around the teacher as the central transmitter of knowledge and mostly rely on text-books and ready-made material.

Table 3.11: Advantages and limitations of curriculum based, standardised education on natural hazards

Strengths
Enables the introduction of the topic into schools and hence prepares a frame stimulating and encouraging engagement with the topic of natural hazards.
May increase trust in science and thus in information on risk management
May contribute to an improved understanding of underlying natural and societal processes resulting in decreased vulnerabilities.
Contributes to the acquisition of procedural knowledge (ability and knowledge of how to learn, where to obtain information about natural hazards and so on).
Seems to contribute to a higher degree of preparedness and knowledge among pupils, although empirical bases remain small.
May contribute to a further spreading of knowledge via personal networks (e.g. parents etc.).
Possible limitations and challenges
If the system is very standardised it may be difficult for teachers to innovate and provide space for hazard related experimental learning
Precondition is to train teachers in new knowledge and skills related to natural hazards (e.g. if topic is newly introduced to a curriculum)
Needs the development of human resources, as well as infrastructural, organisational and institutional contexts

Source: Kuhlicke et al. 2011

→ *Participatory, locally embedded education on natural hazards*: Such modes of education may provide a general frame that needs to be (and, indeed, may be) adapted to the local context. It engages with a specific locality and focuses on concrete events, environments, and relations. They mostly rely on participatory methods by including other actors (e.g. NGOs, local authorities, scientists etc.) and may be based on specific school related projects.

Table 3.12: Advantages and limitations of participatory, locally embedded risk education

Advantages
It is suggested that hands-on, experiential learning based on local experiences, events, and stocks of knowledge is most effective way of educating pupils; however, empirically not investigated yet.
Allows the integration of different actors from the public and private sectors (e.g. NGOs) for integrating different stocks of knowledge and expertise.
Stimulates engagement with the local environmental situation as well as with, personal histories of relatives and the wider civil society.
Possible limitations and challenges
If the system is very standardised it may be difficult for teachers to innovate and provide space of hazard related experimental learning.
Depends mostly on the commitment of individual teachers or schools, might be difficult to involve other local actors/organizations.

Source: Kuhlicke et al. 2011

Work Package 7: Heat Related Hazards in the Barcelona Context

The theme of the Barcelona workshop was heat related hazards. These hazards include droughts, forest fires and heat waves.

One of the central points arising from the Barcelona workshop was the importance of dealing with institutional fragmentation. This problem occurs when there are too many actors performing similar tasks without effectively communicating their actions to each other. Before describing the workshop findings, we therefore start with a description of the institutional management of heat-related hazards in Catalonia.

Droughts: The EU Water Framework Directive (WFD) encourages public participation in the design of water management plans. In Spain state water authorities at the regional and local levels can establish different types of management measures to mitigate the consequences of droughts. In Catalonia, the Catalan Water Agency (ACA) is the public institution with authority over the entire water cycle for the internal watersheds. Stimulated by the WFD, the ACA carried out a participation process during 2006 and 2009 to develop a management plan for river basin districts in Catalonia. Through this process the Agency has developed and implemented a series of instruments and management plans which include a variety of measures aimed at reducing water consumption, the recovery of aquifers and the application of the Drought Decree in 2007 (a result of persistent drought in Catalonia in that year)[2]. Measures taken by the ACA have resulted in reduced water consumption of 6% between 2005 and 2008. The workshop discussion about drought revolved mainly around the right to use water and the right to charge for this use. In the negotiation of these rights, transparency was signalled as a main issue.

Forest fires are managed within the context of the National Forest Programme (NFP) from 1996. The Central Government has the authority to create legally binding frameworks and define guidelines to meet international commitments. The Autonomous Communities implement these frameworks and guidelines in their given area. In Catalonia, prevention and fire fighting

[2] The Government of Catalonia revoked the 2007 Drought Decree in January 2009, once the conditions justifying the emergency situation no longer existed.

authorities are allocated in different departments. The administrative structure for forest fire risk management is complicated. The complexity requires an intra- and inter-organisational setting in order to avoid the overlapping of functions within the regions and at the national level.

The workshop discussions focused on the idea of both social and organisational learning through education and communication due to the problems created by lack of coordination, in addition to the idea of personal responsibility for that learning. The current complexity of institutions involved in, for example, forest fire management results in confusing, incomplete and even contradictory messages. Participants particularly emphasised the need for an overarching institution which is able to group and coordinate all the current actors involved in the management of this hazard. While representatives of the civil society often would like to work more on the 'living with fire' idea, the institutions are seen to be slow on the uptake.

Heat waves are a largely underestimated hazard in terms of the damage they cause. 2003 saw 50,000 causalities in Europe which was twice the amount of the previous year. In Catalonia, this resulted in the creation of an Action Plan (POCS). This plan responded to the recommendations of the Spanish Ministry of Health Care and Consumption and observed an inter-sectoral cooperation embracing the Catalan health care system, the Meteorological Service of Catalonia and the General Directorate for Civil Defence. However, it seems that a clearer definition of roles and responsibilities is required. The main point of concern for the workshop participants was risk perception issues (whether heat waves are perceived as hazards or ignored) and vulnerability (which focused on the position of people within their social networks and the relation of this position to their own vulnerability).

At the Barcelona workshop, participants furthermore referred to the emotional consequences of the hazards, with many of the effects discussed being at the individual and community level. However, many of the conflicts surrounding what is being done centred on a discussion over information provision and the rights of access to a resource. Although most of the effects pointed at the individual and society levels, participants found improvement aspects were better handled at an institutional level. To better understand how to work together, the discussion revolved around the division of responsibilities, communication practices and cross-cutting themes among different administrative levels.

The following table summarises the main strengths and weaknesses of institutional management of heat-related hazards in Catalonia.

Overall assessment of the institutional framework of heat-related hazards in Catalonia

Table 3.13: Strengths and weakness of current heat-related hazard management.

Hazard	Characteristics	Strengths	Weaknesses
Droughts	▪ Multiple actors, networks and partnerships. ▪ Public participation processes. ▪ Multi-scale governance.	▪ Decentralised management at the different scales. ▪ Overall institutional structure: Catalan Agency of Water. ▪ Inter-institutional commission. ▪ Risk communication and risk education.	▪ Inter-sector collaboration. ▪ Reinforcement of participatory processes. ▪ Emergency management. ▪ Connection of stakeholders.
Forest fires	▪ Guided by EU directive. ▪ Multiple actors, networks and partnerships. ▪ Multi-scale governance.	▪ Decentralised management. ▪ Transition towards a risk management.	▪ Complex institutional structure. ▪ Lack of an overall coordination. ▪ Overlapping of functions. ▪ Emergency management. ▪ Connection of stakeholders.
Heat waves	▪ Local scale governance.	▪ Inter-sector collaboration.	▪ Allocation of institutional responsibilities. ▪ Raising awareness. ▪ Emergency management. ▪ Connection between stakeholders.

Source: Supramaniam et al. 2011

During the workshop, several weak points were identified in the way natural heat-related hazards are handled in Catalonia:

→ Risk communication and education need to be improved in order to encourage social capacities and awareness. Communication can be improved by enhancing transparency which can therefore, improve trust.

→ Instead of aiming at a one-size-fits-all approach to encouraging social resilience for heat-related hazards, the different social, geographical, institutional and temporal context of each hazard need to be recognised.

→ There is a need to view disturbances and risks as part of the natural processes and dynamics of socio-ecological systems. A culture of coexistence needs to be built and a holistic approach looking at the interactions between human and environmental/ecological systems facing risks must be adopted.

→ Current policies to handle natural hazards are mostly reactionary and need to take into account all stages of the risk cycle (preparedness, response, recovery and mitigation)

Work Package 8: Alpine Hazards

In the alpine countries, mountain hazards, such as flash floods, avalanches, landslides and debris flows, constitute major threats for human life, human activities, settlements and economic areas, transport routes, supply lines and other infrastructure. These phenomena occur suddenly, are localised, fast moving, violent and difficult to predict. Major events in past decades were the snow avalanches which hit Switzerland and Austria in 1999 and resulted in more than 60 fatalities as well as the floods in the Italian, French and Swiss Alps in the year 2000 that caused €12 billion in losses. The natural sciences recognise the main trigger of alpine hazards in both natural and anthropogenic factors. From the physical perspective, reference is made to climatic changes and particularly to modification of precipitation patterns and temperatures. Also human induced factors (e.g. pressure on land by urbanisation, industrial and economic activities in risk areas, deforestation, building of new infrastructures, etc.) play a relevant role in some alpine areas.

The Gorizia workshop was mainly interested in the relevance and applicability of the CapHaz-Net typology of social capacities to natural hazard management practices. To this aim, for the two alpine case studies Malborghetto-Valbruna (Friuli Venezia Giulia Region) and Vitpiteno/Sterzing (Trentino Alto Adige Region) a Strengths–Weaknesses–Opportunities–Threats (SWOT) analysis was prepared by the workshop organisers and revised by the participants.

In regards to the different capacity, the workshop identified that with regards to knowledge capacities, modern societies have progressively created the illusion of the possibility of 'zero risk'. Due to trust in technology and science, the local population's feeling of safety is therefore relatively high. As a result, risk awareness and 'local knowledge' (that is, knowledge based on experience, observation, understanding nature and transmitting the practices onto the next generations) concerning the territory and previous flood events may decrease, leading to the disappearance of habits and behaviours to be adopted in case of disaster as well as appropriate behaviours in a vulnerable territory. Therefore, in terms of social capacity building, workshop participants deemed the 'rediscovery' of historical and local knowledge as well as risk education as very relevant factors to strengthen communities facing natural hazards.

The relevance of social networks was an issue that was particularly discussed in the workshop. Volunteer civil protection networks are an historical, well rooted reality in the areas of the former Austro-Hungarian Empire. Slovenia, northern Italy and the Austrian region of Carinthia have strong volunteer networks in risk management (Civil Protection in Italy, fire brigades and mountain rescue services in Slovenia and Austria) but also cooperative trans-alpine networks. The volunteers' corps have the characteristics of an institutionalised body for risk and especially emergency management. Volunteers represent a major link between the professional operators and the community. They are prepared in case of emergency and also have a strong presence in the territory. Thus, they are a major factor of community resilience but also an important source of the networks at the local and regional levels.

The governance capacities discussed mostly related to the time period between a disastrous event and the implementation of risk mitigation measures. It was highlighted that the involvement of the public in the processes of mitigation and prevention is stronger if this phase coincides with the phase of reconstruction. However, this is conditional on the situation. In fact, involvement and participation of the local population may work, provided that it is given the possibility to really decide and choose – beginning with the choices related to the immediate aftermath of a disastrous event (e.g. recovery in shelters vs. moving somewhere else) and ending with decisions about reconstruction options (e.g. relocating and building a new town vs. re-building on the same place). Further successful experiences of public involvement were reported with regard to risk assessment and mapping.

Local mediators emerged as an important means of connecting local communities and natural hazard management experts. In northern Italy and Slovenia this expertise is embedded in the local culture, as an expression of the above mentioned volunteers of civil protection. In other contexts such mediators were intentionally created, as in the UK ('local champions') and in Switzerland ('local natural hazard advisor'). However, also in countries with a strong presence of volunteers, mediators of a different nature are needed to bridge the gap between the different domains of knowledge pertaining to the many actors involved in the management of natural hazards.

Moreover, financial capacities were considered as being closely related to governance capacities. The distribution of responsibility, given by the institutional framework, determines the organisation that has to carry the financial burden of natural hazard mitigation and prevention. Clearly defined roles and responsibilities are of great importance, on the part of both the public authorities and the population (according to ownership of land and building and to the running of economic activities). Distribution of responsibility is also a major issue for what concerns insurance schemes. In Switzerland, for example, where such instruments are mandatory, more responsibility is formally allocated to the citizens. On the other hand, a mandatory insurance

might also have the effect that citizens feel less responsible for risk management issues. This issue requires more in-depth research.

The Gorizia workshop particularly highlighted the importance of the role of volunteers in disaster risk management as well as the need for local facilitators to improve the dialogue and reciprocal understanding between the experts and the general public. Public participation thus arose as a field full of potential for the enhancement of social capacities for alpine hazards. The workshop came to the following insights:

- A need for improved communication and participation in decision-making between risk management experts and the public, as well as among other actors involved (authorities, operators, volunteers, stakeholders, etc.) was highlighted. The lack of cooperation was underlined as a concrete barrier for the formation of a 'culture of civil protection'. The flow of information should be multi-directional and knowledge coming from different sources should be acknowledged and used.
- Additionally, communication and the local understanding of disaster reduction management actions can be improved by turning to local knowledge as a further source of information and insight into potential discrepancies between local and expert views. To this purpose the historical perspective can be used as a tool that can provide a valid understanding of past experiences, successes and failures and can help reinforce the memory of the past to strengthen present awareness.
- Numerous successful experiences of managing alpine hazards were reported during the workshop. There is a need of singling out and sharing institutional innovations ('good practices') among different countries (e.g. Swiss local 'hazard advisor'; 'Friuli' model of recovery in the aftermath of the 1976 earthquake in Italy). This can be achieved by the strengthening of cross-country and within-country opportunities for collaboration.

Work Package 9: Floods in Central Europe

Floods are Europe's most widespread and frequent natural disasters. The European Floods Directive (2007/60/EC) defines floods as "the temporary covering by water of land not normally covered by water"[3]. The Directive itself was the response to a number of disastrous floods in Europe during the 1990s and early 2000s. The Elbe flood 2002 alone caused over €20 billion in losses from a total of €150 billion in losses caused by natural hazards in the EU-27 countries (1980-2009), making this event the most considerable in terms of economic damage and losses. Within the frame of current flood management approaches, it is increasingly acknowledged that 'big solutions' in terms of large-scale engineering works cannot always solve 'big problems' like the severe consequences of major floods. The Floods Directive is but one example of this transformation towards risk management.

However, it is not only with regard to flood management that perspectives have changed in recent years. In general, a more comprehensive view on natural hazards is being established, considering not only the hazard itself but also other dimensions such as the vulnerability of people, buildings and infrastructure, risk perceptions and awareness of residents and decision-makers as well as prevention and mitigation strategies that are adaptable and resilient to uncertain future developments[4]. CapHaz-Net is interested in these social aspects of managing natural hazards and the way in which they can be understood in order to encourage more resilient societies.

[3] Directive 2007/60/EC of the European Parliament and of the Council of 23 October 2007 on the assessment and management of flood risks, *Official Journal of the European Union* L288, 27-34.

[4] A good overview of natural hazards and their impacts in Europe was recently published by the European Environment Agency (EEA): *Mapping the impacts of natural hazards and technological accidents in Europe — an overview of the last decade*. Technical Report no. 13/2010, IISN 1725-2237, Luxembourg, http://www.eea.europa.eu/publications/mapping-the-impacts-of-natural (retrieved 20 January 2012).

The findings from the Leipzig workshop showed that although participation is encouraged by the European Floods Directive it is not a new notion. It is rather already taking place at various levels to various degrees.

The European Floods Directive (2007/60/EC) encourages Member States to involve so called "interested parties" within the development of flood risk management plans (Article 10). However, the exact definitions and guidelines regarding how one should go about participation (i.e. who should be involved and how) are not clearly prescribed by the directive, instead this is a task of each Member State.

CapHaz-Net understands participation as taking part, influencing, taking responsibility and empowerment of different interested parties. Interested parties and who they are was a topic of hot debate throughout the workshop. In the end, three parties were defined: (1) the professional public (experts, government representatives and practitioners), (2) the organised public (NGOs and interest groups) and the (3) general public (residents and other individuals). Participation is encouraged between those parties through different levels to different degrees:

- Levels of participation: policies and legislation, plans and programmes, and projects which all comprise of structural and non-structural measures.
- Degrees of participation: While the first three categories focus on different intensities of interaction between decision-makers and the interested parties at risk, the fourth category relates exclusively to interactions between different authorities: 1) information provision, 2) consultation, 3) decision-influencing and 4) inter-organisational exchange.

The main findings from the Leipzig workshop include:

- There are two main types of participation in flood risk management: decision-making that involves the professional/organised public (inter-organisational collaboration/cooperation) and decision-making that involves the general public (public participation: mainly bottom-up, but may be initiated from higher levels, too).
- It was found that while inter-organisational participation usually takes place in the concept of developing policies/legislations and plans/programmes, public participation is usually found at the project level, when main and strategic decisions have already been made.
- At the international and national levels inter-organisational cooperation exists but there is very little participation in terms of consultation and co-decision making with other interested parties, such as the general or the organised public. Bottom-up approaches do exist within education programmes (e.g. in Poland).
- It seems that at present the most intense participation with multiple actors occurs at the project level with respect to structural measures. However, we found that while there are certain trends, there is no one-size-fits-all approach to how this is or should be applied. Furthermore, on the levels of plans, programmes, policy and legislation, although participation is not explicit, projects do not evolve unaided. They are products of previous work, networks and experience.
- Consultation seems to be a popular mode of participation and largely exists in the form of information provision and a time frame within which the public (organised and general) can react in writing. For example, each country mentioned the existence of an Environmental Impact Assessment (EIA) which is required before any large constructions and allows interested parties to make comments in writing. However, only Austria mentioned having two consultation periods; one at the scoping stage and one after the plans have been drafted. The other Central European countries considered mentioned that this consultation only exists in the latter stage.

The workshop clearly showed that social capacity building also needs to take place at the level of the organisations in charge of flood risk management. At this stage these organisations do not have a clear understanding of how to organise the involvement of interested parties. The Leipzig workshop itself offered a forum for horizontal exchange and learning. There is a need for more such forums. However, local and regional participation cultures in the different catchments and

countries also point to different traditions of either more top-down intervention or more participatory bottom-up approaches. This will not change overnight – it will rather require time and resources as well as an acceptance of participation and the benefits that it can bring into the decision-making process.

The following insights arose from the discussions during the Leipzig workshop:

- ⟶ Participation is relevant in the context of flood risk management. It can help to build trusting relationships, encourages learning and sharing of experiences. Moreover, the different modes of participation identified improve relationships and achieve acceptance or consensus.
- ⟶ Defining and identifying "interested parties" that are meant to participate in the development of flood risk management plans is a challenging and at the same time important task. This endeavour should provide a broad overview of the main actors and their interests and relationships. The main questions to be clarified in the course of each participation process are: Who are the interested parties, how and when to involve them, who defines the type of participation, and what are the rationales for a participation process?
- ⟶ Not all interested parties can or should be involved at every level, particularly for larger river catchments. Rather, a two-step approach is suggested. On the catchment level general frames should be developed outlining the overall goals of a flood risk management plan and defining specific roles and responsibilities. This would mostly take place through inter-organisational participation as well as by involving representatives of the organised public. On the local level the general public should participate in the planning and development of measures by including local needs, views and expectations. In other words, representatives of the professional public should act as facilitators while the public should have more freedom to co-design their own solutions.
- ⟶ It was also highlighted that the role of each actor in the decision-making process and therefore the power they possess is of importance and must be taken into account. There are the people with decision-making power (elected officials) and the people who are interested in protecting their interests (e.g. NGOs). It is important to be able to deal with such different actors and their different interests.

Work Package 10: Social Resilience

In the course of the project a number of principles – as general normative statements – were elaborated to steer the process of social capacity building. These principles take the different types of capacities, the major fields of research (risk governance, social vulnerability, risk perception, risk communication and risk education) as well as the findings of the Regional Hazard Workshops into account.

These principles that aim to guide social capacity building activities are explained in more detail in the final Deliverable 10.3. The structure follows for each principle a similar logic: Firstly, the principle is embedded within the scientific debate and challenges are outlined within the context of risk management ('background'). Secondly, the principles are further specified by considering its relationship to social capacity building and provide examples of good practices from across Europe ('what does it mean for social capacity building?'). Third, the relevance of the principle in light of policy approaches and scientific discussions are discussed ('why is it relevant?'). Finally, based on the former descriptions, recommendations for how to improve social capacity building for natural hazards are provided ('recommendations'). In this report, we will only present the recommendations.

CapHaz-Net achieved to outline a strategy and develop specific recommendation framing social capacity building as a long-term process that starts early and should fosters mutual and continuous participatory learning processes. Six principles structure this strategy, whereas theses principles are based both on insights gained through the extensive literature reviews and on

insights gained from three Regional Hazard Workshops. These principles are translated in more specific recommendations and guidance.

Principle 1: Identifying vulnerabilities and prioritising the needs of the most vulnerable

- The most vulnerable members of the community should be identified and this process of identification should be a participative process which involves members of the community and, preferably, the most vulnerable themselves.
- The identification of the most vulnerable as well as their needs should be taken into account in short term emergency management as well as long term strategic management.
- Funds and other types of support should be made available for the most vulnerable in order to better prepare for, cope with and recover from the negative impacts of natural hazards.
- Education and skills development also need to be made available to all actors in order to better prepare for, cope with and recover from the negative impacts of natural hazards.

Principle 2: Making information available

- Information about hazards, risks and vulnerabilities should be made easily accessible and presented in a manner that is understandable to non-specialists.
- Information about responsibilities, rights and obligations of different actors should be clearly communicated with a focus on the implications they have for authorities and communities at risk.
- Information about outcomes of decision-making processes should be transparent and clearly communicated to local (and other) communities.
- Information from different sources on the same issue (e.g. warning or recommendations what to do in emergency case) should be consistent and congruent.
- Information should be presented in a holistic manner; taking into account other risks and issues that affect everyday life quality (e.g. climate change, health, wealth, etc.)
- New ways of making information available to reach the population at large should be explored, tested and applied without losing sight of traditional modes of information provision.
- Information should be shared among organisations working at different levels (e.g. national, regional and local).
- Research results should be made easily accessible in different languages and should be presented in a manner that is understandable to practitioners.

Principle 3: Being participatory and inclusive

- Efforts should be made and resources utilised to identify and engage with the community in order to raise awareness of the opportunity for participation in the decision-making process as well as what impact participation can have and how to get involved.
- Local expertise and knowledge should be considered in the assessment of risks and vulnerabilities as well as in decision-making processes on policies, plans and specific measures. It is beneficial to include not only local knowledge but also different types of knowledge, thus involving experts from different disciplines throughout a process.
- Not all actors can or should be involved at every level. It is important to identify which actors should be involved and when, at what stage of the decision-making processes they should be involved and to what end.
- It is important that any attempts at participation have a clear objective which is communicated from the outset. It is important that community members are informed from the beginning of the influence that they can have on the decision-making process. Otherwise, a lack of clearly communicating the intended objective can have negative

consequences for the participation process itself as well as its outcomes (Twigger-Ross et al. 2011).

- ⟶ In order to ensure that all interests are taken into consideration during a participatory process, it is important that the process of assigning trade-offs between each of the options needs to be open to public input and new forms of decision-making.
- ⟶ A participatory process should enable and facilitate not only a learning process but also network building to leave a heritage for the participants and the community. Moreover participation should be an effective tool for sharing responsibilities among decision-makers and citizens and for providing justifications for risk management decisions.
- ⟶ Participation is not restricted to communication with the public. Rather it also takes place as cooperation between different organisations (horizontal) and within one organisation (vertical). While for some hazards (again triggered by EC directives, such as the Water Framework Directive and the European Floods Directive; EC 2000 and 2007) vertical, inter-organisational, and partly even transboundary cooperation has gathered momentum in recent years, from other hazards a strong institutional fragmentation is reported (e.g. heat-related hazards; Supramaniam et al. 2011). In such a case, it is important that the roles and responsibilities of different organisations working on the management of the same hazards are clear and that there is communication between them.

Principle 4: Building networks

- ⟶ Communication should aim at building or strengthening formal and informal networks and reinforcing adaptive capacity, especially at the level of local communities. This means engaging in a continuous and dynamic process of establishing durable relationships among residents, interest groups, organisations, and institutions involved in risk mitigation and management (Steinführer et al. 2009). The importance of building long-term networks that increase motivation to act is a critical aspect of all three stages of a natural hazard (pre-event, during and post-event).
- ⟶ People rely more on advice, opinions and behaviour from people that surround them in their daily lives. A promising way to get across messages and to encourage specific actions in the face of risk might thus be to team up with ‘local champions’ (e.g. key people strongly embedded in different local social networks and beyond).
- ⟶ A communication strategy that enables dialogue between actors with different forms of knowledge and interests is needed. It involves stakeholders and people at risk in the pre-assessment of the risk and in the planning and decision-making on structural and non-structural measures through two-way communication (Höppner et al. 2010).
- ⟶ Social networks can be employed for warnings and calls to action in communities at risk. Effective one-way communication but also two-way channels that allow for feedback and confirmation are required. Such communication should employ a mixture of formal communication and utilise local networks to disseminate warnings (Höppner et al. 2010).

Principle 5: Starting early

- ⟶ Risk education should be an obligatory part of formal and informal education from childhood onward as social capacity building for natural hazards is a never-ending effort. Ideally, it should thus be a life-long process of social learning. For the time being, however, according to the results of our study, the majority of (secondary) educational systems in Europe are underdeveloped with regard to education about natural hazards; therefore we particularly recommend strengthening formal education.
- ⟶ Teaching about natural hazards and their impacts needs to apply different approaches (e.g. various media and tools). A shift towards comprehensive understanding of the relations between natural and social processes is required.
- ⟶ As well as learning about the hazard, students need to be taught what to do in the event of an emergency.

- → Natural hazards education should include locally based forms of participatory learning focused on a specific locality, concrete events, environments and relations.
- → Local communities can contribute to both formal and informal risk education of children and teenagers. Flood markers, local archives and eye witnesses of past events should be included as valuable sources of local knowledge.

Principle 6: Sharing responsibilities fairly

- → Public funds should be made available to support individual/communal adaptation and coping measures (e.g. making properties resilient to natural hazards), rather than this being dependent upon the differentiated and uneven availability of resources within households and communities.
- → The delegation of responsibilities to other levels (e.g. local level) or other actors (e.g. community members) needs reconsidering social vulnerability as this transfer might create new vulnerabilities if it is not accompanied by additional resources.
- → In the aftermath of a disaster, funds should be made available for mitigating unequally distributed recovery capacities.
- → Organisations need to work together with other agencies and organisations (e.g. NGOs, private sector) when delivering pre-event (e.g. raising awareness), event (e.g. warning and emergency response) and post-event (e.g. providing shelter and support) responsibilities.

4. Potential impact

CapHaz-Net aimed at establishing links (i) within academia, (ii) between different knowledge communities including academics and practitioners (iii) as well as within practice oriented stakeholder groups.

In total CapHaz-Net managed to get in direct contact with 356 participants from 17 European and Non-European countries, which were involved in 8 different workshops across Europe over the course of the project. Table 4.1 provides an overview about the single workshops, their participants and potential impacts.

Table 4.1: CapHaz-Net workshops

Workshop	Nr of external participants, specification from which sector from which area
"1st Thematic Meeting on Social Capacity Building & Risk Governance" (Lancaster, UK, November 2009)	13 external guests from a total of 39 participants. Sector: - Government Ministry – 2 - Government agency – 1 - Consultant – 1 - Planner – 1 - Research – 8
"2nd Thematic Meeting on Risk Perception & Social Vulnerability" (Haigerloch, Germany, March 2010)	16 external guests from a total of 38 participants. Sector: - Government Ministry – 1 - Consultant – 1 - Research - 14
"3rd Thematic Meeting on Risk Communication & Risk Education" (Ljubljana, Slovenia, June 2010)	17 external guests from a total of 47 participants. - Municipality – 1 - Insurance– 1 - Teacher – 1 - Research – 14
Dialogue avec l'équipe du projet européen CapHaz-Net, (Paris, France, September.2010)	Additionally to the scheduled workshops, a larger meeting was organised by AFCPN (Association Française pour la Prévention des Catastrophes Naturelles). The aim was to further stimulate the interaction with representatives of the French research community and NGOs. About 70 scientists, decision makers and representatives of the civil society participated in this meeting.
CapHaz-Net Southern Europe Hazard Workshop: Heat-related hazards – droughts, forest fires and heat waves (Barcelona, Spain, October 2010) (WP 7)	31 external guests from a total of 51 participants. Sector: - Forest Consortium of Catalonia – 2 - Emergency services (fire brigade) – 1 - Utilities (water) – 1 - Civil protection – 1 - Health agency – 1 - Civil society (pensioners association) – 2 - Water New Culture Network – 1 - Government Ministry – 3 - NGO (Red Cross) – 1 - Research - 18
2nd CapHaz-Net Regional Hazard Workshop: Social capacity building for alpine hazards (Gorizia, Italy, April 2011) (WP 8)	19 external guests from a total of 35 participants. Sector: - Law – 1 - Civil protection – 4 - Engineering – 2 - Consultant – 1 - Municipality – 3
Participation in Flood Risk Management as a means for Social Capacity Building (Leipzig, Germany, May 2011) (WP 9).	22 external guests from a total of 41 participants. Sector: - Municipality – 1 - Government Ministry – 5 - Water board – 1 - Landscape design – 1 - Consultant – 1
Final CapHaz-Net Workshop	7 external guests from a total of 25 participants.

(Zürich, Switerland, December 2011)	Sector: - Government ministry – 1 - Research - 6

In sum, throughout the project, CapHaz-Net engaged with various groups of stakeholders by different means and in different degree of intensity. In general, by the very activity of the consortium the relevance of the very idea of social capacity building was highlighted and practiced. So far the term was used in policy-documents in a rather abstract and general manner: CapHaz-Net managed to give some more substance to this notion and connect it with more established fields of research and practice.

- ⟶ The Regional Hazard Workshop on Heat-Related Hazards managed to bring together practitioners and policy-makers operating in different hazards fields (i.e. forest fires, heat waves and droughts) and offer them a forum for exchange. The workshop achieved to develop a shared understanding among participants to strive for a more integrative view on the management of heat-related hazards attempting to overcome the current institutional and organisational fragmentation and considering more overarching questions of risk prevention and governance.
- ⟶ The Regional Hazard Workshop on Alpine Hazards, on the contrary, brought together practitioners and policy-makers operating in the same hazard field but come from different European countries and regions. Similar as the workshop before, it increased the participants' awareness for the need for improved communication and participation in decision-making between risk management experts and the public, as well as among other actors involved (authorities, operators, volunteers, stakeholders, etc.). Apart from that, numerous successful experiences of managing alpine hazards were reported during the workshop underlining the need of singling out and sharing institutional innovations ("good practices") among different countries. There is an increased awareness that this can be achieved by the strengthening of cross-country and within-country opportunities for collaboration.
- ⟶ The Regional Hazard Workshop on Floods in Central Europe focused on participation as encouraged by the European Floods Directive. The workshop clearly showed that social capacity building also needs to take place at the level of the organisations in charge of flood risk management. At this stage these organisations do not have a clear understanding of how to organise the involvement of interested parties. The Leipzig workshop itself offered a forum for horizontal exchange and learning. There is a need for more such forums.
- ⟶ Furthermore, a workshop with French ISDR activists, stakeholders and representatives of the research community from the field of social science natural hazards research was organised in Paris in September 2010. The workshop made the project well known within the French community and provided valuable input for further exchange and collaboration.

Furthermore, CapHaz-Net disseminated three Policy-Briefs to more then 350 stakeholders (about 200 copies as printed versions and 150 as digital version), across Europe. The briefs outlined the central findings of the project. Brief 1 and 2 were translated into Italian, Slovene, Catalan, Spanish and German (Brief 1 also in French) to make the Briefs also available to local and regional stakeholder. As this was considered as a relevant part of the dissemination activity of the project, it was an extra-effort of the consortium to make sure that the results are also made available for those working on the more practical side of the management activities.

All WP reports were made publicly available after their official submission and can be downloaded from the project website. From several colleagues the coordinators received positive feedback on these reports. They pointed out that the reports provide very valuable overviews of the state of the art in the respective thematic field and, not least, that it can be used for teaching purposes in universities.

The consortium prepared and contributed to two sessions at larger international conferences. There was one session at the 21. IAPS conference on „Vulnerability, Risk and Complexity: Impacts of Global Change on Human Habitats" (27 June – 2 July 2010) in Leipzig and another session at the General Assembly of the EGU in Vienna in April 2012

Furthermore, the consortium proposed a Special Issue to the Open Access Journal Natural Hazards and Earth System Sciences entitled: “Building Social Capacity for Natural Hazards: An Emerging Field of Research and Practice in Europe”. The proposal was accepted and we meanwhile received more the 20 abstracts from with the projects, from colleagues accompanying the project as well as from experts from all over Europe and am sure that Special Issue will further increase the visibility of this topic and the project across Europe (all the more as it is an Open Access Journal)

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Call for Papers for a Special Issue to be published in Natural Hazards and Earth System Sciences (NHESS)

“Building Social Capacities for Natural Hazards:

An Emerging Field for Research and Practice in Europe”

Edited by Christian Kuhlicke[1] and Annett Steinführer[2]

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Call for papers

Building capacities for natural hazards is a topic increasingly gaining relevance not only for so-called developing countries but also for European welfare states which are increasingly and continuously challenged by the social, economic and ecological impacts of natural hazards. This is quite remarkable, as European countries have so far been considered as the capacity builders; the idea that it is necessary to build capacities in Europe itself is rather a recent one and implies that there is also a lack of capacities on the part of contemporary European societies. Yet, while the concept is referred to in various policy documents, the scientific discussion needs yet to evolve.

The purpose of the NHESS Special Issue is to offer forum to different views and conceptualisations and to structure this emerging field of research and practice by identifying different types of social capacities, different approaches to building and enhancing capacities as well as good practices. We will consider contributions from a broad range of research and policy initiatives centring on more established concepts in risk and hazard research such as

- Risk governance (e.g. how is the risk governance landscape in Europe but also in other parts of the world changing and what implications does this have for building capacities?);
- Risk perception (e.g. how does people’s risk awareness influence their capacities to adapt to and cope with natural hazards?)
- Social vulnerability (e.g. how are people’s capacities influencing their vulnerability?),
- Risk communication (e.g. which forms of communication seem particularly relevant for developing social capacities?) and
- Risk education (e.g. how can we develop social capacities in the long term by starting at a young age?)
- Resilience (e.g. how should adaptive capacities as well as learning capacities of individuals and organisations be developed?)

The Special Issues intends to stimulate and document discussion and exchange in this area of research and practice and will therefore cover different thematic topics. We particularly welcome include papers discussing practical examples and good (or poor) practices of social capacity building in different regions across Europe as well as papers that focus on different hazards (e.g. floods, droughts, alpine hazards etc).

We will only consider abstracts with a clear reference to capacity building (cf. also www.caphaz-net.org)

Please send your abstract to christian.kuhlicke@ufz.de and annett.steinfuehrer@vti.bund.de by Friday, 8 June 2012. We will send out letters of acceptance until the end of June 2012. Final paper need to be submitted to between July 2012 and November 2012.

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A number of scientists and stakeholders from different European countries accompanied the project throughout its existence, provided feedback, asked for results and came to more than one of the workshops.

Another meaningful way of networking occurred by means of CapHaz-Net's Advisory Board with representatives from three national ISDR platforms: The Advisory Board (AB) consists of representatives of three national ISDR platforms, that is, AFPCN (France), DKKV (Germany) and PLANALP (Alpine Convention). The senior advisors to CapHaz-Net are:

- Roland Nussbaum (Board member of the Association française pour la prévention des catastrophes naturelles AFPCN and Managing Director of Mission Risques Naturels, MRN, France)
- Gerd Tetzlaff (Deutsches Komitee Katastrophenvorsorge e.V. DKKV, Germany)
- Maria Patek (Federal Ministry of Agriculture, Forestry, Environment and Water Management – Lebensministerium, Austria, and representative of the Austrian delegation with PLANALP – Platform on Natural Hazards of the Alpine Convention)

The advisors used their networks to disseminate information about about and outcomes of the CapHaz-Net project. With the support of Roland Nussbaum, even a French version of the Policy Briefs (originally not intended) was produced and widely spread. While conducting these activities, the AB members particularly highlight the new role of social scientists in the field of natural hazards research.

Generally, the final outcome of the project (Del 10.3) could have an impact on the practical and policy-related side. As these principles encourage a conceptualisation of social capacity building efforts that not only aim at reducing the impacts of natural hazards, but also serve as a basis for improving the relationships among organisations involved in the management of natural hazards as well as between such organisations and local communities exposed to natural hazards. In order to operationalise the findings of the CapHaz-Net project, these principles form the basis for a guidance tool that allows for assessment of existing social capacities as well as highlighting those that may need to be developed by organisations and local communities. This guidance tool could eventually be developed further towards a participatory audit tool that would allow assessing the capacities of organisations and communities in regards to adapting to, coping with and possibly recovering from the impact of natural hazards.

Table #: List of Scientific (peer reviewed) publications

NO.	Title	Main author	Title of the periodic or the series	Number, date or frequency	Publisher	Place of publication	Year of publication	Relevant pages	Permanent identifiers	Is/Will open access provided to this publication?
1	Natural hazards and resilience: exploring institutional and organisational dimension of social resilience	Christian Kuhlicke	Natural hazards	Online first	Springer	New York	2011	1-6	DOI 10.1007/s11069-011-9901-x	No
2	Perspectives on social capacity building for natural hazards: Outlining an emerging field of research and practice in Europe	Christian Kuhlicke	Environmental Science and Policy	7 (14)	Elsevier	Online Journal	16. Sept. 2011	pp. 804-814		
3	‚Robuste Anpasung': Einige Einsichten der geographischen Hazardforschung zur Diskussion um den Klimawandel.	Christian Kuhlicke	Berichte zur deutschen Landeskunde	85/3	Institut für Länderkunde	Leipzig	2011	257-266		No
4	Building Capacities for Natural Hazards: An Emerging Field for Research and Practice in Europe (Special Issue)	Christian Kuhlick	Natural Hazards and Earth System Sciences	Proposal accepted	European Geoscience Union	Göttingen	2013			Yes
5	Soziale Verwundbarkeit gegenüber Hochwasser. Eine Fallstudie in Deutschland und ihre Implikationen.	Annett Steinführer	GIAI	21 (3)			In print (2012)			
6	Freiwillige Feuerwehren	Annett	LIT			Münster	In print			

	als Einrichtungen der Daseinsvorsorge – tradiertes Ehrenamt im gesellschaftlichen Wandel. In: Kaufmann, Stefan; Jenki, Markus; Ellebrecht, Nils (eds.): Organisationen und Experten des Notfalls. Technik und Kultur von Feuerwehr und Rettungswesen im Wandel	Steinführer					(2012)		
7	Vulnerability, Risks, and Complexity. Impacts of Global Change on Human Habitats	Sigrun Kabisch			Hogrefe	Göttingen	2012		
8	Localism and flood risk management: highlighting the potentials and challenges for communities in England	Chloe Begg	Environmental Planning C				To be submitted		
9	The role of participation in natural hazard management. Evidence and challenges from two case studies in the Alps	Chiara Bianchizza	Natural Hazards and Earth System Sciences (NHESS)				The article is in progress-abstract has already been submitted		
10	Neodgovorna odgovornost	Matija Zorn	Naravne nesreče	2	Založba ZRC	Ljubljana	2011	149 pp.	http://giam.zrc-sazu.si/sites/default/files/Naravne-nesrece-02.pdf
11	Izobraževanje o naravnih nesrečah	Blaž Komac	Georitem	18	Založba ZRC	Ljubljana	2011	110 pp.	Fully avail. On Google Books
12	Linking social	Hoeppner, C.	Natural				Accepted		Yes

	capacities and risk communication in Europe: a gap between theory and practice?		Hazards					
13	The Risk Perception Paradox –Implications for Governance and Communication of Natural Hazards	Gisela Wachinger	Risk Analysis			Accepted (In revision)		
14	Some lessons for resilience from the 2011 multi-disaster in Japan	Walker G	Local Environment	16(9)		2011	937-941	
25	Reflections on risk governance and resilience in a European context	Walker G	Risk governance. The articulation of hazard, politics and ecology	Edited book	Springer-Verlag	forthcoming	N/A	

Table #: List of Dissemination Activities

NO.	Type of activities[5]	Title	Main Leader	Date	Place	Type of audience[6]	Size of audience	Countries addressed
1	Workshop	CapHaz-Net: Kick-Off Meeting	UFZ	9-10 July 2009	Leipzig, Germany	Scientific	31	Germany, UK, France, Slovenia, Spain, Italy, Switzerland
2	Workshop	CapHaz-Net 1st Thematic Meeting on Social Capacity Building & Risk Governance	LANC	9-11 Nov. 2009	Lancaster, UK	Scientific, civil society, policy makers	39	Austria, France, Germany, Switzerland, UK, Italy, Slovenia, Spain
3	Workshop	CapHaz-Net 2nd Thematic Meeting on Risk Perception & Social Vulnerability	DIA	11-12 March 2010	Haigerloch, Germany	Scientific, civil society, policy makers	38	France, Germany, Italy, Romania, Slovenia, Spain, Switzerland, the Netherlands, Turkey, UK
4	Workshop	CapHaz-Net 3rd Thematic Meeting on Risk Communication & Risk Education	ZRC SAZU	06-09 June, 2010	Ljubljana, Slovenia	Scientific, civil society	47	Czech Republic, Finland, France, Germany, Italy, Norway, Poland, Romania, Serbia,

[5] e.g. publications, conferences, workshops, web, press release, flyers, articles published in popular press, videos, media briefings, presentations, exhibitions, thesis, interviews, films, TV clips, posters, and other.

[6] e.g. scientific community (higher education, research), industry, civil society, policy makers, media

								Slovenia, Spain, Switzerland, UK
5	Workshop	CapHaz-Net 1st Regional Hazard Workshop: Heat-related hazards – droughts, forest fires and heat waves	UBA	06-09 Oct. 2010	Barcelona, Spain	Science, industry, civil society, policy makers	31	Australia, Austria, France, Germany, Italy, Slovenia, Spain, Switzerland, UK, USA
6	Workshop	2nd CapHaz-Net Regional Hazard Workshop: Social capacity building for alpine hazards	ISIG	04-05 April 2011	Gorizia, Italy	Science, civil society	35	Austria, Italy, Germany, Switzerland, France, Slovenia, Spain, UK
7	Workshop	CapHaz-Net 3d Regional Hazard Workshop: Participation in Flood Risk Management as a means for Social Capacity Building	UFZ	10-11 May 2011	Leipzig, Germany	Science, policy makers, civil society	41	Germany, Slovenia, Spain, Italy, Switzerland, Austria, Poland, Czech Republic, UK
8	Workshop	CapHaz-Net final Workshop: Knowledge Inventory: State of the art of natural hazards research in the social sciences and further research needs for social capacity building	WSL	15-16 Nov. 2011	Zurich, Switzerland	Science, policy makers	25	UK, France, Germany, Switzerland, Poland, Slovenia, Austria, Italy, Spain
9	Meeting	Social capacity building for natural hazards: Towards more resilient societies	UFZ	27 Oct. 2009	Coordinators meeting – natural hazards, Brussels Belgium	Science	20	EU
10	Meeting	CapHaz-Net: Social capacity building for natural hazards:	UFZ	03 March 2010	Meeting of the Working Group on “Knowledge Base on	Science	30	EU

		Towards more resilient societies			Climate Change Impact and Adaptation, Brussels Belgium			
11	Workshop	Social Capacity Building in the field of natural hazards and the role of risk communication	WSL	06 July 2010	EC/UNISDR-Workshop: Climate Change Impacts and Adaptation: Reducing Water-related Risk in Europe, Brussels Belgium	Science, policy makers	100	EU
12	Bulletin	Social Vulnerability Bulletin No. 4	UFZ	Oct 2010	Munich Re Foundation	Science, policy makers, industry, civil society		International
13	Newsletter	Description of CapHaz-Net	UFZ	March 2010	IGU Commission C09.29 – Mountain Response to Global Change	Science, policy makers, industry, civil society		International
14	Newsletter	Information regarding the 1st thematic “Kick-Off Meeting”	UFZ	August 2009	DKKV	Science, policy makers		Germany
15	Newsletter	European Research Framework Programme Research on Climate Change” prepared for chapter VI “Climate relevant projects of Natural Hazards and Extreme Event CapHaz-Net an Exercise to Assess Research Needs and Policy Choices in Areas of Drought	UFZ	2009	The Third World Climate Conference (WCC-3) and the UNFCCC Conference of the Parties (COP-15)	Science, policy makers, civil society		International
16	Newsletter	Druga delavnica mednarodnega projekta "CapHaz-Net" Lancaster, Združeno kraljestvo, 9.-11. 11. 2009	ZRC SAZU	2009	Geografski vestnik Zveza geografskih društev Slovenije, 81, (2), 143-145, Ljubljana, Slovenia	Science, policy, makers, civil society		Slovenia
17	Newsletter	Tretja delavnica mednarodnega projekta	ZRC SAZU	2010	Geografski vestnik Zveza geografskih društev Slovenije,	Science, policy, makers,		Slovenia

		"CapHaz-Net" o ranljivosti družbe zaradi naravnih nesreč in dojemanju ogroženosti zaradi naravnih nesreč, Haigerloch, Nemčija, 10.-12. 3. 2010			Vol. 82, No. 1, 123–125, Ljubljana, Slovenia	civil society		
18	Newsletter	Četrta delavnica mednarodnega projekta "CapHaz-Net" o komuniciranju ob naravnih nesrečah in izobraževanju o naravnih nesrečah, Ljubljana, 7.-9. 6. 2010	ZRC SAZU	2010	Geografski vestnik Zveza geografskih društev Slovenije, Vol. 82, No. 1, 129–132, Ljubljana, Slovenia	Science, policy, makers, civil society		Slovenia
19	Newsletter	Peta delavnicamednarodnega projekta "CapHaz-Net" o suši, gozdnih požarih in vročinskih udarih, Barcelona, Katalonija, Španija, 6.-9. 10. 2010	ZRC SAZU	2011	Geografski vestnik, Zveza geografskih društev Slovenije, Vol. 83, No. 1, 113–114, Ljubljana, Slovenia	Science, policy, makers, civil society		Slovenia
20	Newsletter	Sedma delavnica mednarodnega projekta "CapHaz-Net" o nižinskih poplavah v srednji Evropi, Leipzig, Nemčija, 10.-11. 5. 2011	ZRC SAZU	2011	Geografski vestnik , Zveza geografskih društev Slovenije, Vol. 83, No. 1, 115-116, Ljubljana, Slovenia	Science, policy, makers, civil society		Slovenia
21	Conference	»Dialogue avec l'équipe du projet européen CapHaz-Net, www.caphaz-net.org « Social Capacity Building for Natural Hazards: Toward More Resilient Societies »	AFPCN/UFZ	24.09.2010	Paris, France	Science, NGOs, Policy-makers	70	France, UK Germany, Switzerland, Slovenia, Italy, Spain
22	Presentation	Introduction to CapHaz-Net	UFZ	24 Nov. 2010	Paris, France	Science, NGOs, Policy-makers	70	France, UK Germany, Switzerland, Slovenia, Italy, Spain
23	Presentation	WP 1 social capacity building for natural hazards	UFZ	24 Nov. 2010	Paris, France	Science, NGOs,	70	France, UK Germany,

							Policy-makers		Switzerland, Slovenia, Italy, Spain
24	Presentation	Risk governance in the field of natural hazards : state of the art and research challenges	LANC	24 2010	Nov.	Paris, France	Science, NGOs, Policy-makers	70	France, UK Germany, Switzerland, Slovenia, Italy, Spain
25	Presentation	Risk perception in the field of natural hazards : state of the art and research challenges	DIA	24 2010	Nov.	Paris, France	Science, NGOs, Policy-makers	70	France, UK Germany, Switzerland, Slovenia, Italy, Spain
26	Presentation	Social vulnerability in the field of natural hazards : state of the art and research challenges	MU	24 2010	Nov.	Paris, France	Science, NGOs, Policy-makers	70	France, UK Germany, Switzerland, Slovenia, Italy, Spain
27	Presentation	Risk communication in the field of natural hazards : towards a new framework	WSL	24 2010	Nov.	Paris, France	Science, NGOs, Policy-makers	70	France, UK Germany, Switzerland, Slovenia, Italy, Spain
28	Presentation	Risk education in the field of natural hazards : state of the art open research questions (with specific consideration for formal education efforts	ZRC SAZU	24 2010	Nov.	Paris, France	Science, NGOs, Policy-makers	70	France, UK Germany, Switzerland, Slovenia, Italy, Spain
29	Presentation	CapHaz-Net and RiskMap : Natural hazards management projects including the issue of socio-economic resilience	UFZ	07 2010	Oct.	International workshop on resilience: Harnessing science for better disaster management, Venice Italy	Science	50	International
30	Presentation	Soziale Fähigkeiten im Umgang mit Naturgefahren in Europa : Befunde und Forschungsbedarf	UFZ	18 2011	Jan.	Risiko 2.0 Neuer Umgang mit alten Naturgefahren, 11. Forum Katastrophenvorsorge, Postdam, Germany	Science, policy makers	70	Germany

31	Presentation	On the cleavage between the 'general public' and the 'experts' in flood risk management : implications for integrated adaptation strategies	UFZ	02 March 2009	Risk and Planet Earth, Vulnerability, Natural Hazards, Integrated Adaptation Strategies, Leipzig, Germany	Science, policy makers	100	International
32	Presentation	Radical surprises and human security – Theoretical and empirical insights from the 2002 flood	UFZ	22 June 2009	GECHS Synthesis Conference, Human Security in an Ear of Global Change, Oslo, Norway	Science, policy makers	100	International
33	Poster	Socail capacity building for natural hazards : the CapHaz-Net project	UFZ	19 Sept. 2009	Deutscher Geographentag 2009, Vienna, Austria	Science	50	EU
34	Presentation	Social dimension of risk and vulnerability	UFZ	13 Sept 2010	Storm Surges Congress 2010: Risk Management of current and future Storm Surges, Hamburg, Germany	Science	100	EU
35	Presentation	Risk communication and natural hazard : State of the research	WSL	13 Sept 2010	Storm Surges Congress 2010: Risk Management of current and future Storm Surges, Hamburg, Germany	Science	100	EU
36	Presentation	Social Capacity Building towards disaster risk resilience in England: The impacts of risk governance	Chloe Begg - UFZ	28 March 2012	Lancaster, UK	Science	30+	UK
37	Conference presentation/poster	Social Capacity Building towards disaster risk resilience in England: The impacts of risk governance	Chloe Begg - UFZ	22-27 April 2012	European Geophysics Union General Assembly, Vienna	Science	11,000+ for whole conference	95 for whole conference
38	Conference presentation/poster	Social Capacity Assessment for Communities and Organisations in the CapHaz-net Context	Chloe Begg - UFZ	22-27 April 2012	European Geophysics Union General Assembly, Vienna	Science	11,000+ for whole conference	95 for whole conference
39	Conference presentation	Social Capacity Building towards disaster risk resilience in England: The impacts of risk	Chloe Begg - UFZ	03-05 July 2012	Royal Geographic Society Conference, Edinburgh, UK	Science and civil society	30+ (in the session)	UK (in the session)

		governance							
40	Conference presentation	A capacity assessment towards resilient societies	Jochen Luther - UFZ	22-27	April 2012	European Geophysics Union General Assembly, Vienna	Science, policy makers	11,000+ for whole conference	95 for whole conference
41	Stakeholder/policy workshop	Participatory practices in flood risk management in central Europe: Towards an assessment of organisations' capacities.	Jochen Luther - UFZ	17-19	April 2012	Thematic Workshop Stakeholder involvement in flood risk management, Bucharest, Romania	Science, policy makers, civil society and the media	200+	Almost all EU member states
42	Stakeholder/policy workshop	Central European experiences with the implementation of the EU Floods Directive and Participation	Jochen Luther - UFZ	17-19	April 2012	Thematic Workshop Stakeholder involvement in flood risk management, Bucharest, Romania	Science, policy makers, civil society and the media	200+	Almost all EU member states
43	Conference presentation	Soziodemographischer Wandel und Verwundbarkeit gegenüber Extremereignissen. Eine akteursbezogene Perspektive auf schrumpfende und alternde ländliche Räume (Socio-demographic change and vulnerability to extreme events. An actor-centred perspective on shrinking and ageing rural areas)	Annett Steinführer – vTI	12.-13	Nov. 2010	Working Group Rural Areas of the German Association of Geography „Entwicklung ländlicher Räume: Theoretische Ansätze, empirische Forschung und politische Gestaltungsmöglichkeiten", Vechta University, Germany	Science	40+	Germany
44	Meeting of the Scientific Board of the German Committee for Disaster Risk Reduction (DKKV)	CapHaz-Net: Erste Projektergebnisse zur Halbzeit (Half time results of the CapHaz-Net project)	Annett Steinführer – vTI	06	Dec. 2010	DKKV, Bonn, Germany	Science and policy makers	20+	Germany
45	Lecture Series „Land use systems and land use conflicts"	Ländliche Räume in Deutschland als Alltags-, Siedlungs- und Hochwasserrisikogebiete: ein unlösbarer Widerspruch? (Rural areas in Germany as	Annett Steinführer – vTI	11	Jan. 2011	Ludwig Maximilian University Munich, Germany	Science	15	Germany

		places of daily life, settlement and flood risk: a contradiction without solution?)						
46	11th German Forum Disaster Mitigation "Risk 2.0. Neuer Umgang mit alten Naturgefahren"	Soziale Fähigkeiten im Umgang mit Naturrisiken. Ein skalenübergreifender akteurszentrierter Zugang zur Katastrophenvorsorge in Europa (Social capacities facing natural risks. A cross-scale and actor-centred approach to disaster mitigation in Europe)	Annett Steinführer – vTI	18.-19 Jan. 2011	GFZ German Research Centre for Geosciences Potsdam, Germany	Science, policy makers and civil society	80+	Germany
47	Conference „Organisationen und Experten des Notfalls. Technik und Kultur von Feuerwehr und Rettungswesen im Wandel"	Freiwillige Feuerwehren als Einrichtungen der Daseinsvorsorge in ländlichen Räumen: Ehrenamt im gesellschaftlichen Wandel (Fire brigades as services of general interest in rural areas: volunteering in social transformation)	Annett Steinführer – vTI	29.-30 Sept. 2011	University of Freiburg, Germany	Science and civil society	50+	Germany
48	Lecture Series Agricultural Economics	„Um Mitternacht stimmt die Norm". Freiwillige Feuerwehren als Einrichtungen kommunaler Daseinsvorsorge zwischen professionellen Ansprüchen und tradiertem Ehrenamt ('At midnight we keep the standard': Voluntary fire brigades as services of general interest between professional demands and traditional volunteering)	Annett Steinführer – vTI	01 Feb. 2012	Johann Heinrich von Thünen Institute, Federal Research Institute for Rural Areas, Forestry and Fisheries	Science	50+	Germany
49	3rd Moravian Conference on Rural	When the volunteers cannot come anymore: German fire	Annett Steinführer –	03.-07 Sept. 2012	Mendel University Brno, Czech Republic	Science and civil	Event to come	International

	Research EURORURAL '12, poster presentation	brigades facing and responding to socio-demographic challenges	vTI			society		
50	12th Forum Disaster Mitigation "Risk. Learning – Teaching – Living"	Session "Risk communication and self protection" (session chair together with representative from German Red Cross)	Annett Steinführer – vTI	13.-14 Nov. 2012	DKKV Bonn, Germany	Science, policy makers and civil society	Event to come	Germany
51	Presentation	Ende oder Anfang, top-down oder bottom-up? Zugänge zur Verwundbarkeit im deutschsprachigen Raum und einige empirische Beispiele	Christian Kuhlicke	10.05.2010	WSL	Science	20	Switzerland
52	Presentation	Social Dimensions of Risk and Vulnerability	Christian kuhlicke	17.10.2010	Storm Surges Congress	Science	50+	International
53	Presentation	The dark side of resilience: exploring the meaning of resilience in the context of institutions and power	Christian Kuhlicke	03.6.2011	Journée d'études, Séminaire resilience urbaine, Département de Géographie, École normal supérieur	Science	20+	International
54	Presentation	Social capacity building and vulnerability from a European perspective	Christian kuhlicke	16.03.2012	Flooding in Ireland: Perceptions, Preparedness and Policy	Science, policy makers, civil society	120+	Europe
55	Policy Brief	Policy Brief 2: On the shoulders of gaints: a summary of Caphaz-Net's initial findings	UFZ	02 March 2011		Science, policy makers, civil society	300+	Europe
56	Policy Brief	Policy Brief 3:Between institutional fragmentation and community involvement: Practices of social capacity building in the management of natural hazards in Europe	UFZ	02 March 2012		Science, policy makers, civil society	300+	Europe
57	Presentation	Interventionist and participatory approaches to flood risk mitigation decisions: two case studies in the Italian Alps	Chiara Bianchizza – ISIG	27 April 2012	European Geophysics Union General Assembly, Vienna	Science	30+	Italy, Europe

58	Presentation	The role of participation in natural hazard management and decision making	ISIG	26 March 2012	National Research Council (CNR) Padova Italy	Science	30+	Italy, Europe
59	Presentation	Public participation in natural risk mitigation decisions and a simulation exercise with PhD. Students	ISIG	7-9 September 2011	6th LARAM workshop, University of Salerno. Salerno, Italy	Science	30+	Italy, Europe
60	Meeting on possible further research work based on CapHaz-Net findings		ISIG	18 March 2011 and 18 May 2011	Ravenna (Italy) – MedIngengeria headquarters	Science	10	Italy
61	Meeting of dissemination of project results on resilience/social capacity building for natural hazard management		ISIG	14-16 November 2010	Centro Studi Foligno (Italy)	Science	12	Italy
62	Meeting of dissemination of project results on resilience/social capacity building for natural hazard management		ISIG	10 and 27 September 2010	National research Council (CNR) , Padova; Centro studi Foligno (Italy)	Science	12	Italy
63	Final conference for the EC FP7 ENSURE project , Distributed CapHaz-Net flyers		MU	10-11 Mary 2011	Orleans, France	Science and policy makers	200+	EU
64	Presentation	Social Capacity Building for Floods: An emerging field of practice and research in Europe	MU	27-29 September 2011	International conference 5th International Conference on Flood Management (ICFM5), Tokyo, Japan	Science and policy makers	450+	41
65	Series of 4 lectures	Lecture titles: 1. Concepts and definitions of	MU	October 2011	Cambridge University, Cambridge UK	science	60	Mainly UK but some overseas

		environmental hazards, risk and disasters 2. Dimensions and complexity of hazards and disasters 3. Mitigation measures for environmental hazards Flood hazard case studies						students
66	Poster/presentation	Social vulnerability assessment: a growing practice in Europe	MU	27 April 2012	European Geophysics Union General Assembly, Vienna	science	11,000+ for whole conference	95 for the whole conference
67	Knowledge transfer workshop		MU	13 June 2012	WSKEP Flood Risk Management Workshop, Oxford, UK	Science, industry, civil society, policy makers	45	UK
68	Presentation	Natural hazards and education in Europe	Blaž Komac – ZRC SAZU	July 12-16, 2010	IGU Regional Conference, UGI conférence régionale, Tel Aviv, Israel	Science, policy makers	400+	International
69	Presentation	Natural hazards and risk education	Primož Pipan – ZRC SAZU	27 June - 2 July 2010	Vulnerability, risk and complexity : impacts of global change on human habitats : abstracts of presentations / 21. IAPS Conference, Leipzig, Germany	Science and policy makers	400+	International
70	Presentation	Understanding European education landscape on natural disasters - a textbook research	ZRC SAZU	27 April 2012	European Geophysics Union General Assembly, Vienna	Science	30+	International
71	Conference	Naravne nesreče v Sloveniji ’11 / Natural Disasters in Slovenia ‘11	ZRC SAZU	March 25 and 26, 2011	Ig, Idrija, Solvenia	Science, Civil society, Policy makers, and Media	200	Slovenia
72	Presentation	Rationales and effects of stakeholder involvement	WSL	26 October 2011	Lyon, France	science	400	France
73	Presentation	Effects of risk communication	WSL	27 April	European Geophysics Union	Science	30+	International

		on property owners' risk awareness and prevention behavior		2012	General Assembly, Vienna			
74	Poster	IFKIS – ten years of experience with the intercantonal early warning and crisis information system as a good-practice example for local capacity building	WSL	27 April 2012	European Geophysics Union General Assembly, Vienna	Science, policy makers	11,000+ for whole conference	95 for whole conference
75	Focus group	What kind of education is possible to improve risk awareness in flood hazards?	DIA	20 May 2010	Stuttgart, Germany	Civil society and policy makers	12	Germany
76	Presentation	Auenwälder und Flutgefahren Naturschutzverantwortung versus Partizipation?	DIA	30 August 2010 – 1 Sept. 2010	Vilm, Germany (Biodiversität und Klimawandel - Vernetzung der Akteure in Deutschland VII)	Science, civil society and policy makers	120	Germany
77	Presentation	The risk perception shift of natural hazards: risk governance is needed	DIA	3 May - 6 May 2012	Salzburg SCUPAD Congress 2012 Front Page Planning: Before and After Major Events, Disasters and Social Unrest	Science, civil society, policy makers and the media	50	International
78	Presentation	A Shift in Natural Hazard Perception: Implications for Risk Governance	DIA	18 July 2012 – 20 July 2012	Sydney (World Congress on Risk 2012 "Risk and Development in a Changing World")	Science, civil society, industry, policy makers and the media	1000+	International
79	Conference presentation/poster	A framework for profiling the characteristics of risk governance in diverse European natural hazards contexts	LANC	27 April 2012	European Geophysics Union General Assembly, Vienna	Science, policy makers	11,000+ for whole conference	95 for whole conference
80	Presentation	The complexity of natural hazards in the perception of	DIA	27 June 2010	International Association People-Environment Studies	Science and policy	100	International

		decision makers and the concerned public			(IAPS), Vulnerability, Risk and Complexity: Impacts of Global Change on Human Habitats, Leipzig, Germany	makers		
81	Presentation	Risk communication for resilient societies – A critical review of practices and trends in Europe	WSL	27 June 2010	International Association People-Environment Studies (IAPS), Vulnerability, Risk and Complexity: Impacts of Global Change on Human Habitats, Leipzig, Germany	Science and policy makers	100	International
82	Presentation	Natural hazards and risk education	ZRC SAZU	27 June 2010	International Association People-Environment Studies (IAPS), Vulnerability, Risk and Complexity: Impacts of Global Change on Human Habitats, Leipzig, Germany	Science and policy makers	100	International
83	Presentation	Risk governance, resilience and natural hazards: Towards a framework for analysis?	LANC	27 June 2010	International Association People-Environment Studies (IAPS), Vulnerability, Risk and Complexity: Impacts of Global Change on Human Habitats, Leipzig, Germany	Science and policy makers	100	International
84	Presentation	Risk communication and natural hazard: State of research	WSL	13 Sept. 2010	Storm Surges Congress 2010: Risk Management of current and future Storm	Science and policy makers	100	International

Surges, Hamburg, Germany

5. Public website address and relevant contact details

http://www.caphaz-net.org/

http://caphaz-net.org/project-overview/extended-network/Institutions/portal_factory/Company/company.2012-06-26.8804434191/edit

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