



KNOW4RR
Disaster Risk Reduction Knowledge

Towards the Development and Implementation of Effective Policies for Disaster Risk Reduction and Climate Change Adaptation

POLICY BRIEF

Executive Summary

The development and implementation of effective policies to ensure disaster risk reduction (DRR) and climate change adaptation (CCA) need close collaboration and knowledge exchange between decision makers, the scientific community, the private sector, and civil society organisations, as well as the public. In practice, two major problems have been identified. First, knowledge about DRR and CCA is often fragmented among the different stakeholders and disciplines. Secondly, the various regional levels (local, national and international) and different scales of crises involve a range of stakeholders with widely different competencies to deal with constantly changing risks that require dynamic adaptation.

This policy brief indicates the key findings and recommendations for policy making in DRR and CCA based on the results of the FP7- funded project KNOW-4-DRR. Key findings relate to 1) understanding and addressing the gaps between knowledge and the implementation of policies, 2) mechanisms and processes for overcoming barriers to sharing and implementing knowledge and 3) framing a knowledge management system, achieved through interactive workshops and living labs as test environments for tools and methodologies.

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The Challenge

Knowledge fragmentation can create barriers to sharing and implementing knowledge leading to a lack of co-ordination, partnership and cooperation, and a good and traceable communication of knowledge.

Often information is disregarded, not known or inaccessible to the user; sometimes it is tied to and remains within departments and institutions. The case study of Vietnam illustrates that understanding who knows what and who has received which information is invariably far from clear. Yet at the same time, the Lorca living lab and the Mexican case study demonstrate that local knowledge is generally not sufficiently considered in DRR planning. Further, DRR policies are still considered to be too much top down and not grounded in real needs, as shown by the case studies of Mexico, Spain and Vietnam.

Moreover, other priorities, objectives and constraints influence the decision-making process regarding DRR and CCA although awareness of its importance is rising amongst stakeholders. Information about it is sometimes poorly understood. When it is passed on by intermediate communicators, such as the media, it can become inaccurate, as illustrated in the case studies provided by partners and as was found at the workshop on decision making in Bonn, Germany.

Given the challenges, it is evidently very important to engineer an opportunity, possibly a virtual one, which enables communication and overcomes the fragmentation of knowledge among stakeholders by making provision for participation and fruitful exchanges. This is why we have focused on constructing a common multi-scale space which allows for producing, diffusing and using knowledge. This results in a twofold added value: 1) it has the capacity to improve DRR and CCA and consequently reduce damage and losses and 2) it ensures the development of new collective knowledge. For achieving that, the following issues need to be addressed. How to:

- Produce “new collective knowledge” by capitalizing on the very diverse knowledge already available.
- Encourage society to invest resources in disaster prevention and climate change adaptation.
- Encourage the various stakeholders to interact and exchange knowledge not only in times of crisis but also when hazards/disasters are not uppermost in people’s minds.

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Requirements for an effective knowledge management framework

- Different **forms of knowledge need to be comprehended and distinguished.**
- **Learning capacity** could be increased by sufficient training and prior practice.
- Through awareness of current problems the **availability of accessible, relevant information** should be facilitated.
- **Educational programmes** need to be part of a learning strategy. Evidence shows, e.g. in Spain, that students know more about natural hazards than the general population. Therefore programmes should reach **beyond schools and communities** in order to achieve spill-over effects.
- One-sided information flows in knowledge e.g. from research to the public or authorities, need to be replaced by **multiple information flows** as Lorca in Spain exemplifies.
- As demonstrated in the project, living labs and other participatory approaches, e.g. interactive workshops, can generate **feedback mechanisms** that involve targeted stakeholder groups.
- Feedback mechanisms also allow the integration **of local and indigenous knowledge, including tacit knowledge** e.g. in DRR planning activities.
- **Co-designed bottom-up knowledge** bearing in mind that local and indigenous knowledge increases the success of disaster risk management (DRM).
- **Making terminology**, which can be challenging, understandable, e.g. in the case of Vietnam where local stakeholders found that the information they received on extreme weather events was difficult to understand.
- The Vietnam case also showed that **timing and accuracy of information**, e.g. about extreme weather, needs to be improved.
- **Processes** that integrate the **consideration of the scales** in using information and taking decisions need to be put in place. The workshop on decision making in Bonn stressed that not only is uncertainty reduced by using the appropriate data but that different scales of disasters require different emergency responses and therefore can considerably affect the outcomes.



- **Procedures and coordination activities** need to be aligned, for instance in the case of the **EU Flood Directive and the Water Framework Directive**.
- **Effective communication and information-exchange in governmental agencies** needs to be ensured by preserving institutional memory through adequate human resources management, by eliminating competition between agencies, by making available sufficient resources and by clearly defining the roles and responsibilities of stakeholders.
- Awareness on actions over time needs to be developed and maintained. Media can play a vital role in that respect- as the project demonstrates- through **developing multi-media products** including radio- and Web-TV podcasts. The **role of social media** in delivering information needs to be enhanced. The living lab in Vietnam forcefully demonstrated that clear and simple messages via a mix of communication strategies such as theatre, TV, and mobile street displays are useful for **raising awareness**.
- The development of **systems for sharing real-time knowledge** which lead to prompt decisions during the response phase of a disaster are essential, as proved by the findings from the four living labs.
- Effective forms of web-based knowledge and information produced **cooperatively and shared** need to be used and innovative approaches developed.

Innovation in knowledge management: living labs



A living lab is where stakeholders can co-produce new knowledge by developing and testing tools or methodologies. Thus, they contribute to the collective intelligence which supports core experimental capabilities and shared understanding. In living labs, learning and knowledge creation happens within complex environments while providing the opportunity to carry out real-time community studies of DRR and CCA. Four living labs at different levels (local, national, and interregional; see Report on Living Labs) were developed in the project: in Vietnam, Spain (Lorca) and Italy (Po River basin and Umbria Region). They all involved enquiry and consideration of how the exchange of information, and also how the co-production of knowledge by various social/institutional groups might be helped or hindered under differing circumstances.

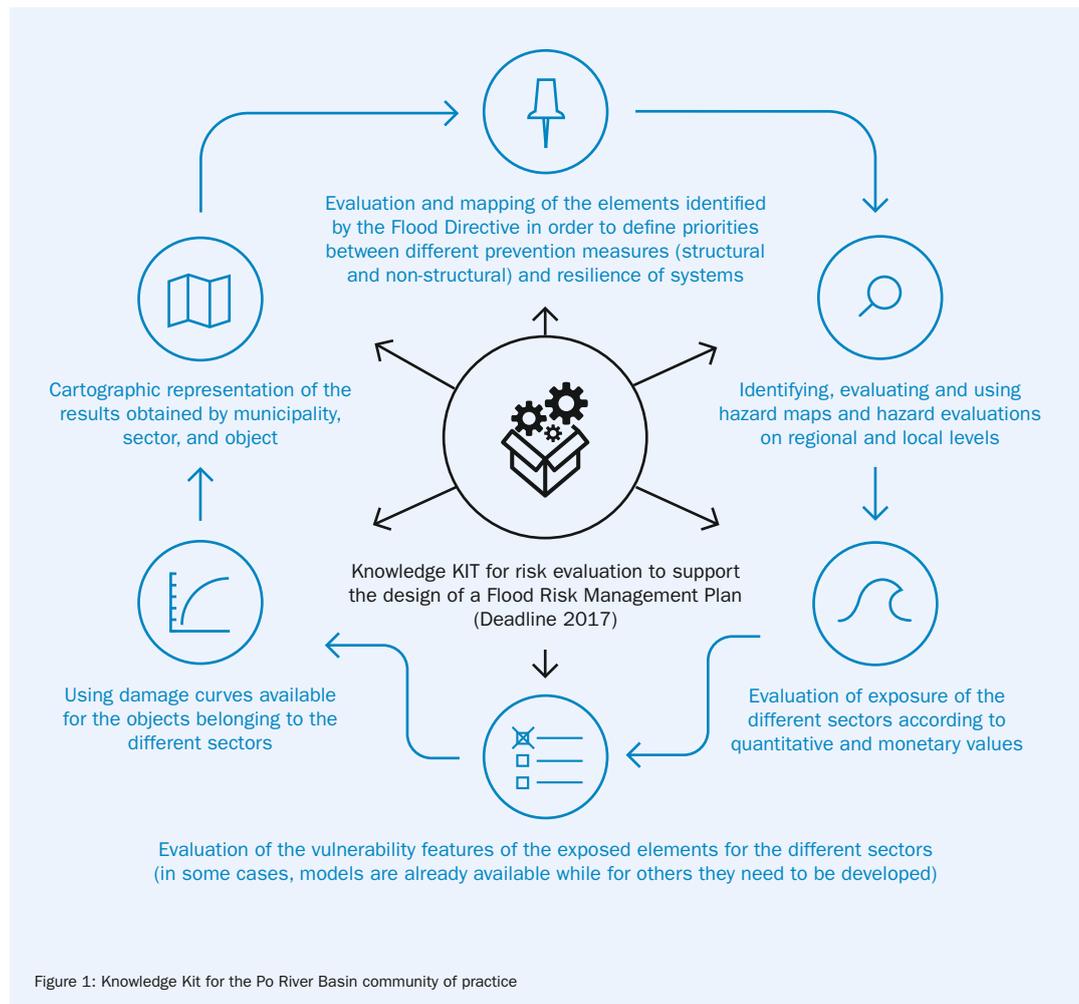
Central Vietnam Living Lab: Activity in the living lab focused on the work undertaken to achieve safer housing for vulnerable communities in coastal regions prone to floods and typhoons. The investigations found that many of the initiatives and actions require successful collaboration between public sector officials and technicians, households, local stakeholders, schools, etc. to strengthen interaction and generate multi-directional learning.

Lorca (Spain) Living Lab: DRR and CCA in Spain were considered in general and also in the local and regional contexts of Murcia and the town of Lorca. In collaboration, researchers, local authorities and secondary schools reported on the events connected with two natural disasters which affected the Lorca municipality. Surveys of stakeholders and other activities showed that flows of information are usually one way; the intended outcome was only partially achieved, and feedback from targeted audiences was generally insufficient.

Umbria (Italy) Living Lab: The living lab brought together a wide range of actors, including researchers, students, public officials, and volunteers to develop and test new, enhanced tools for collecting and analysing post-flood damage data. They combined both reconstruction and prevention by establishing a post-flood damage knowledge database. Through learning from others, the lab helped to raise the awareness of stakeholders, some of whom are generally reluctant to share information outside their institution, and achieved common strategies and willingness to collaborate.

Po River basin (Italy) Living Lab: Work on DRR in the Po River Basin within the activity was undertaken by a core group (represented by the Po River Basin Authority, its staff and a group of researchers) and a second group (comprised of the representatives of different regional and provincial administrations). This distinction was of relevance as the core group directly contributed and actually developed a knowledge asset or knowledge KIT (see Figure 1) while the second group provided KIT input and ideas. The continuous participation of the authority provided a special impulse to the living lab activity and permitted the introduction of ideas that had been discussed directly in the flood risk management plan as required by the Floods Directive.

Figure 1 displays a knowledge KIT showing the process of how to evaluate risk to support the design of this plan.



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Towards a knowledge management framework

To activate informed, evidence-based decisions taken by all stakeholders involved in DRR and CCA, a knowledge management framework (KMF) is needed. Such a framework enables lessons from the past to be applied, and optimizes public expenditure in communication and information diffusion by enlarging the target subjects. Thus the efficiency, effectiveness and robustness of future DRR and CCA policy development and implementation can be increased, which, in turn will deliver long-term budgetary savings. Guidelines or criteria- depending on the circumstances – that need to be considered prior to taking any decision likely to have an impact on a given community and/or environment are prerequisites for a KMF. For the best results all procedural, technical and cultural components must be considered. Also, creating a participatory environment is essential in that respect and can be achieved, as demonstrated in the case of the KNOW-4-DRR project, for example by interactive workshops and living labs.

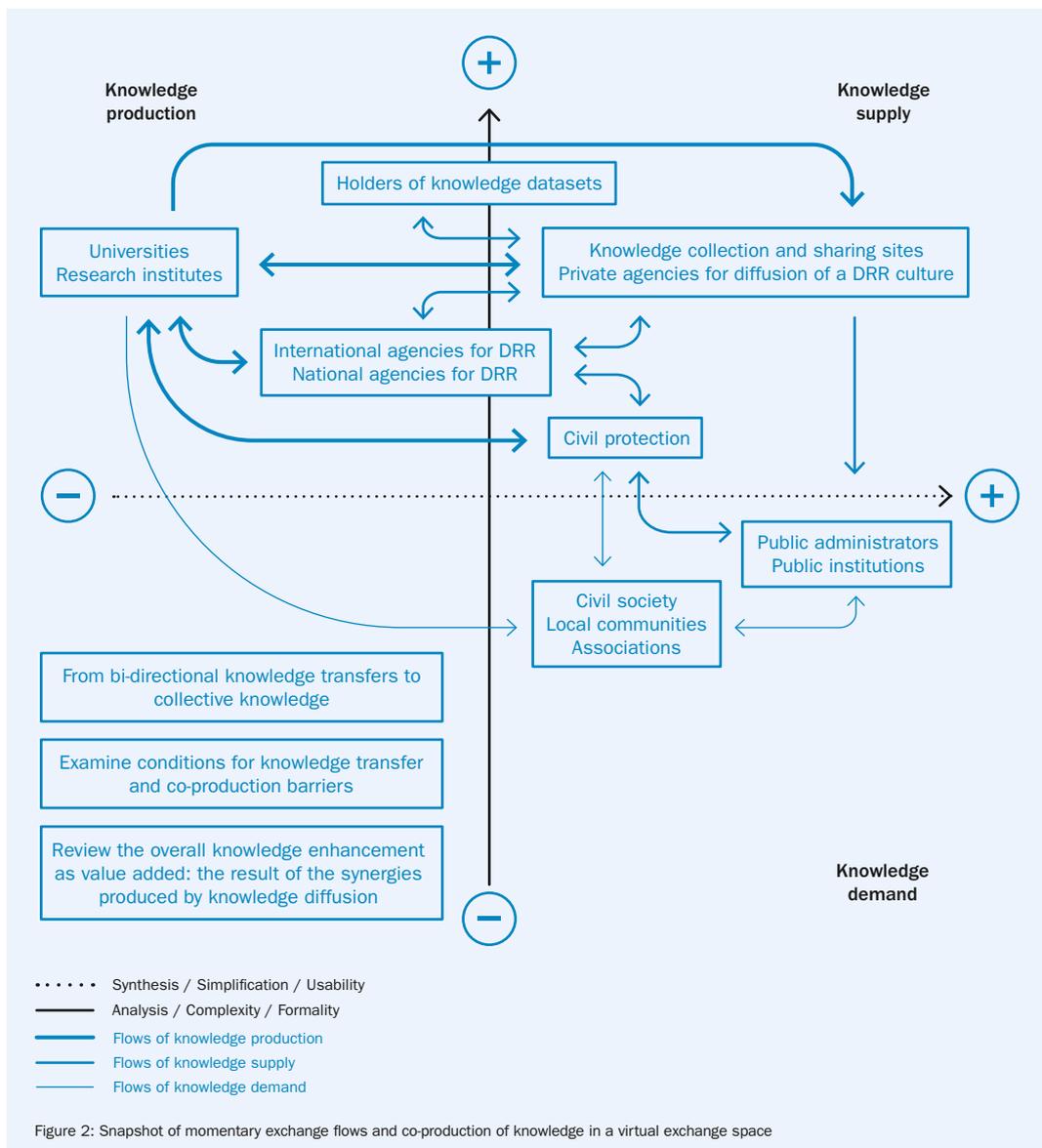
Therefore the KMF is imagined as a virtual exchange space where knowledge stakeholders produce, diffuse and use knowledge, where they interact with each other, exchange knowledge assets and place themselves according to cyclic chains of production-supply-demand for knowledge. The value added derives from 1) the completeness of the exchanges embodied in the expected enhancement of DRR action on all scales and in the associated reduction of damage and 2) the increased capability for building new collective knowledge as the result of a dynamic network of interactions.



The KNOW-4-DRR project results emphasize that the design for a framework should encompass the following qualities: accuracy, transferability, transparency, openness. They equally must be based on reliable data and provide a virtual space for exchanging knowledge and “learning”, without having to be accompanied by someone to orchestrate the search for documents or equipped to know what to look for. Besides, the design has to be adaptable, i.e. able to adjust to what users need from the frameworks and the knowledge they contain. At the same time within the framework there should be demand-oriented packages of knowledge assets and enabling tools, the so-called “Knowledge KITS” or “knowledge assets”. The KMF aims to:

1. Enhance the production of innovative tools and procedures at the research and operational levels.
2. Involve stakeholders across all levels and tailor knowledge to target group and context.
3. Build trust and achieve understandable, collaboratively produced, shared and useful knowledge.
4. Be as relevant to policy makers as to all other actors - scientists, practitioners and civil society, and involve them at all levels.

Figure 2 depicts such a complex space understood as a catalyzer of knowledge transformation that offers a huge variety of knowledge and information from a great range of perspectives and stakeholders in DRR and CCA.



Project Results

1. Case studies

Thirteen case studies allowed uncertainties during the four phases of the DRM cycle to be analysed and recommendations proffered. The case studies also enabled the mapping of the exchange of knowledge. This mapping explored the information, and how it was transmitted. It clarified what happened to the information, whether or not it was used and how by different stakeholders with their various priorities and capacities, and how they have affected decision making for DRR at all stages. The overall intention was to identify where blockages occurred or action was taken on the basis of information transmitted and ultimately to highlight whether or not the information helped decision making and a DRR outcome.

2. Interactive workshops in Bolzano, Salzburg and Bonn: uncertainties, networks and decision making

Uncertainty in crisis in Bolzano, Italy

10-11 December 2013

The workshop elaborated on the requirements of various stakeholder groups (scientific, regional authorities, and national institutions) regarding uncertainty in crisis situations at the various stages of knowledge development and on different spatial and temporal scales. The event drew forth differences in the understanding of what uncertainty means and what level of uncertainty, if any, is acceptable when decisions need to be taken. At the workshop, participants were engaged in a Flood Control Game simulating situations in which different agencies, stakeholders, and social groups in a complex setting and with different mandates respond to an impending risk. It clearly emerged that stakeholders from various entities such as the public sector, private sector and civil society and scientists have different perspectives and attitudes to knowledge priorities. The workshop identified three central topics for discussion: 1) the communication of uncertainties, 2) the existing spaces for a potential reduction of uncertainty and 3) the issue of mapping knowledge flows in the decision-making processes.

The role of networks in DRR and CCA in Salzburg, Austria

27-28 May 2014

This workshop with representatives of various networks from both the disaster and climate change adaptation communities identified synergies, developed a common understanding of the challenges facing the networks and the approaches being used, and found new ways of collaborating. The workshop enabled the mapping of some of the most active networks in the DRR and CCA arena and provided room for discussing what makes a network adapt to changes and become established.

Decision making in disaster risk reduction across different levels in Bonn, Germany

10-11 December 2014

This workshop brought together decision-makers from the DRR community who all work on a common aspect of DRR but at different levels, ranging from legislative authorities to civil society organizations. Using the real case of the Elbe floods in 2002 and 2013, the workshop aimed at elaborating the barriers and bridges in multi-level decision making regarding flood risk management. The simulation exercise provided the opportunity to reflect collectively and decide on mitigation measures. Simultaneously it allowed constraints that decision-makers encounter in real life to be explored.



3. National seminars in Athens, Madrid and Mexico City

DRR integrated with CCA in times of crisis: aspects from Europe

7 April 2014, Athens, Greece

Seminar participants discussed how the economic, social, institutional, and political crises of the last years in Greece have affected decision making and the implementation of mitigation measures concerning DRR integrated with CCA, as well as how knowledge is used at such times. Thus, the event enhanced the dialogue between experts across traditional disciplinary boundaries on the core issue of knowledge management for DRR and CCA. The seminar was a pioneer in this field.

Scientific knowledge and risks implied by DRR and CCA legislation

17-18 November 2014, Madrid, Spain

This seminar looked at the role of scientists in facilitating the implementation of risk prevention and CCA policies and considered the controversies that may arise while interpreting science for policymaking because uncertainties remain. Lawyers, representatives from the insurance business, civil protection officials and researchers exchanged their views on how different interpretations of risks and different knowledge types affect the way severe hazards and risks have been and still are managed in Europe. They further discussed the issues of divergent interpretations possibly triggering social conflict and of the responsibility of scientists working for governments and public administrations.

Gathering knowledge on DRR and CCA between Latin America and Europe

20-22 April 2015, Mexico City, Mexico

The seminar built a bridge between experiences in Europe and Latin America and constituted a unique opportunity to share the project results and to discuss issues that scholars from Europe often take for granted, e.g. the relevance of common sense and vernacular knowledge. A large gap between the topics selected for scientific investigation and the knowledge stakeholders need became apparent. Thus much stronger cooperation is required to overcome the present inefficiencies in knowledge production.

Further information about the KNOW-4-DRR projects & its results

- KNOW-4-DRR Website: www.know4drd.polimi.it
- Project Flyer
- Four Biannual Legisletters: a newsletter monitoring and presenting relevant EU and international policies and initiatives in the field of disaster risk reduction and climate change adaptation
- Reports and keynote documents providing more in-depth and scientific information about the project's findings
- Peer-reviewed journal articles distilling the project's findings
- Events for instance on: 1) how to promote the integration of existing networks active in the field of DRR, and 2) how to develop communication activities for radio and web-TV
- Multi-media products, including radio- and Web-TV podcasts

The Project partners



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