Strengthening Capacity in Climate Change Adaptation connecting science and practice

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Abstract

Worldwide, climate change adaptation (CCA) is part of a complex setting that also needs to take sustainable development (SD) and disaster risk reduction (DRR) into account (IPCC, 2012). The uncertainties associated with managing climate change are high. Developing the capacity to reduce the risk associated with disasters (e.g. floods and droughts) is a central theme in water management. Scientific insights, data and practical experience in the form of integrated knowledge when made available to practitioners at the appropriate level, and using the appropriate language and format can contribute to better solutions for DRR and CCA.

To this end, the CATALYST project (www.catalyst-project.eu), uses innovative approaches including a virtual platform together with face-to-face workshops as part of a think tank process to create exchange among scientists and practitioners, and identify potential means of communicating new scientific insights in and approaches to DRR/CCA. Participants in this think tank process have used these fora to discuss the state-of-the-art in hazard management, and identify transformative best practices that enhance capacity in DRR/CCA. This paper describes the approach, its initial results in Europe and Asia and how this contributes to capacity development in the DRR/CCA arena, particularly in the realm of water management.

Keywords: climate change adaptation, disaster risk reduction, capacity development, think tank, science practice interface, stakeholder process, innovation, transformative best practices.

1. Introduction

The world is changing and developing rapidly. Among the major causes of this change are population growth, urbanization, industrial development, consumer behaviour, shifts in climatic patterns and related phenomena. These changes increase the need to develop capacity to address such risks. The way in which we prepare for, respond to,

and recover from climate change related events, can increase our adaptive capacity and resilience to these events. Rather than to go for crisis management, we may wish to go for iterative risk management strategies, in order to address the long time frames needed for the planning and implementation of appropriate adaptation strategies.

The International Panel on Climate Change (IPCC) indicates in its special report on extreme events (IPCC, 2012), that there is substantial knowledge to improve the management of risks stemming from extreme climate change events; the problem is that we often do not manage to take advantage of this knowledge. The critical issue then becomes how to transfer this knowledge to practitioners in an appropriate form? How can we develop our capacity – to make use of innovative and potentially transformative solutions to reduce hazard risks and/or adapt to change? The related capacity development should therefore focus on how to prepare and respond as well as on how to derive appropriate knowledge, out of the multitude of information and knowledge sources.

This paper describes one such innovative approach, as developed in the CATALYST project *(Capacity Development for Hazard Risk Reduction and Adaptation)*, funded by the European Framework Programme 7. The project is intended to strengthen capacity development for stakeholder involvement in disaster risk reduction in the context of natural hazards. With the use of a think-tank process combining face to face with virtual fora to bring together practical experts, scientists and policy makers with existing knowledge and expertise from three fields: climate change adaptation, disaster risk reduction, and sustainable development. These three fields come together in water management, a key sector concerned with hydro-meteorological hazards, in particular floods and droughts. In the Think Tank discussions, current approaches and practices contributing to capacity development in DRR/CCA, and the identification of best practices, are being made accessible to those practitioners, decision-makers and scientists that will benefit from this knowledge. Before presenting the approach used, its results and its advantages and limitations, the setting of climate change adaptation, disaster risk reduction, sustainable development and how this relates to capacity development in water management, is briefly described.

2. Defining Disaster Risk Reduction, Climate Change Adaptation, and Sustainable Development and the link to capacity development in water management

In this section, we briefly define disaster risk reduction (DRR), climate change adaptation (CCA) and sustainable development (SD), and explain the linkage among these in the context of capacity development within water management. For the purpose of this project, we build on the definitions as used by platforms of experts, in particular the Intergovernmental Panel on Climate Change (IPCC) and the United Nations International Strategy for Disaster Reduction (UNISDR), and insights already shared by other scientists and practitioners on the connection among the concepts of DRR, CCA and SD.

Disaster risk reduction is “the concept and practice of reducing disaster risks through systematic efforts to analyse and manage the causal factors of disasters, including through reduced exposure to hazards, lessened vulnerability of people and property, wise management of land and the environment, and improved preparedness for

adverse events" (UNISDR, 2009). Climate Change Adaptation is defined as "the adjustment in the natural or human systems in response to actual or expected climate stimuli or their effects, which moderates harm or exploits benefit opportunities" (IPCC, 2007). As defined in the so-called Brundtland Report, "sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (World Commission on Environment and Development, 1987).

Disaster risk reduction is linked to sustainable development since the need for DRR is often a response to unsustainable elements of development such as urbanization, deforestation, agricultural practices and other land and water use management trends. At the same time, disaster risk reduction can contribute to the achievement of sustainable development by reducing impacts and losses and improving human development practices (UNISDR, 2009). Furthermore, many disaster risk reduction measures can directly contribute to adaptation (UNISDR, 2009). In fact, adaptation rather than being separate from DRR is increasingly perceived within the DRR sector as a form of risk reduction.

Parry (2009) indicates that unsustainable development has been and still is considered to be the root cause of climate change, while at the same time, sustainable development is a necessary, and probably sufficient, condition for overcoming this challenge in the longer term. Simply 'adding on' mitigative and adaptive strategies to unsustainable development will not work (Parry, 2009). Hence effective climate change measures also contribute to sustainable development, as acknowledged by IPCC. For example, water-saving technologies and practices reduce the burden on ecosystems during water scarce or drought conditions. In flood-prone areas, the designation of agricultural and urban land as floodplains can result in the re-naturalization of land, and thus enhancing biodiversity while reducing the exposure of populations and infrastructure to floods.

The term 'climate compatible development' is also used to highlight the link between climate change and development. Climate compatible development is defined as a 'development first' approach that minimizes the harm caused by climate impacts, while maximising the many human development opportunities presented by a low emissions, more resilient future (Mitchell and Maxwell, 2010).

Capacity development, which is at the core of the CATALYST project, is a connecting thread that runs through the practice of DRR, CCA and SD (see figure 1). Capacity development refers to "the process by which people, organizations and society systematically stimulate and develop their capacities over time to achieve social and economic goals, including through improvement of knowledge, skills, systems, and institutions" (UNISDR, 2009, Alaerts and Kaspersma, 2009). In the water sector, much of the discourse has focused on the sustainable development of water as a resource. Developing the capacity to manage this resource sustainably plays a central role, but cannot take place in the absence of developing our capacity to manage water in the context of DRR and CCA. In the discussion of DRR and CCA, the term resilience is commonly used to refer to "the ability of a system, community or society exposed to hazards to resist, absorb, accommodate to and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and

restoration of its essential basic structures and functions" (UNISDR, 2009).

Furthermore, resilience refers to "the capacities of people, places, and infrastructure to not only cope with hazards, but the longer term processes that enable the social system to adjust to and learn from hazard events and adapt to future ones" (Cutter, 2012). There are many debates in the literature on the concept of resilience (Miller et al. 2010) which highlights the need to craft a common understanding.

The need for a common understanding is also acknowledged in the discourse on bringing climate change thinking into development thinking, as stressed by the Climate Development Knowledge Network (CDKN). The creation of a strong evidence base is needed, while there are often gaps in the information and conflicts over the sources of information used to generate models. This can be addressed through participatory processes, which enhance acceptance of the resulting information as a basis for action (Ellis, et al 2013).

The focus of this paper is on bringing the various concepts that are important for effective water-related hazard management together, documenting the state of the art and identifying some of the innovative approaches that can transform current practices into best practices with an emphasis on capacity development. To begin, several criteria for best practices that help to integrate DRR and CCA are drawn from Gero et al (2011). These include:

1. a holistic approach to vulnerability reduction;
2. use of multi-sectoral and multi-stakeholder approach;
3. ensuring genuine community participation;
4. overcoming fragmented policy frameworks;
5. focusing on both "hard" and "soft" solutions to vulnerability reduction;
6. drawing upon traditional knowledge where possible and where possible, link local observations of climate change to scientific knowledge; and
7. practicing roles and responsibilities for disaster response, since severe weather may become more frequent and intense with climate change.

Capacity development to bring about transformative best practices in water management in a manner that responds to the needs of interconnected demands DRR CCA and SD, is the mechanism to bring about increased resilience. The CATALYST project has identified some of the best (or at least good) practices that are concerned with water management in response to DRR and CCA and, that when taken together, fulfill these criteria.

3. Approach: The CATALYST Think Tank Approach

Design of the Think Tank as a tool for capacity development in DRR/CCA

The Think-Tank process as part of the CATALYST project began in 2012. The objective was to create a platform for the development of a common knowledge base. The Think Tank approach involves stakeholder processes at two levels: a multi-regional think tank process at the global level and four regional processes. The regions addressed, represented in Figure 2, are East and West Africa, Central America and the Caribbean, European Mediterranean, South and South East Asia. The Think Tank currently comprises more than 75 participants from research, government, intergovernmental organizations, NGOs and business, and the number of members is

increasing. Think Tank members can engage in joint structured and unstructured discussions through a variety of media - workshops, virtual meetings, online discussion fora, social networks, and bilateral face-to-face meetings - designed to foster a mutually beneficial transfer of knowledge, and to jointly identify topics of relevance to climate change adaptation and disaster risk reduction strategies. The Think Tank process has fostered discussions on such issues as information and data gaps, methodological limitations, and institutional barriers and seeks in particular to encourage exchanges of information and experiences between the research and policy communities.

Hazards faced by the Think Tank Regions

Each of the regional Think Tank processes is described below, including the specific thematic focus area of the region.

East and West Africa

Africa as a continent is large and heterogeneous, and facing numerous climatic hazards, such as floods and droughts. The challenge posed by natural hazards has been amplified by armed conflict, civil wars, political instability and chronic economic crises. Floods in Mozambique and Kenya in 1997-1998 and 2000 spurred major emergency relief efforts as many people lost their lives and thousands more were displaced. Similarly, in 2009, many West African cities experienced torrential rainfalls resulting in death and property loss. Circulation models indicate that climate change impacts are significantly heightening both the frequency and intensity of climatic hazards in Africa, raising the likelihood of extreme events, including droughts and floods (IPCC 2007). DDR and CCA in an urban context is a specific focus of this regional Think Tank as large urban centres are particularly vulnerable to climate-related natural hazards.

In the Think Tank, the countries included in East Africa (EA) are Burundi, Comoros, Djibouti, Eritrea, Ethiopia, Kenya, Madagascar, Malawi, Mauritius, Mayotte, Mozambique, Réunion, Rwanda, Seychelles, Somalia, Uganda, United Republic of Tanzania, Zambia, Zimbabwe. In Western Africa (WA) Benin, Burkina Faso, Cape Verde, Cote d'Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Mauritania, Niger, Nigeria, Saint Helena, Senegal, Sierra Leone, and Togo are included.

Central America and the Caribbean

Central America, more than 500,000 square kilometers in size, is home to over 40 million people. The region has not only suffered from violent conflicts and economic crises but is also prone to a wide range of natural hazards, including seismic and tectonic activities, floods, tsunamis, droughts and tropical storms.

With three active tectonic faults (the Cocos, Caribbean and Nazca plates) and 27 active volcanoes – and situated on the western edge of the Caribbean hurricane belt – Central America is among the world's most disaster-prone areas (Uribe et al, 1999). Some 49 tsunamis occurred along Central America's Caribbean and Pacific coasts between 1539-1996. Striking in 1992, the Nicaraguan tsunami generated a 9.5-metre wave that flooded the west coast (Fernandez et al., 2000). Mountainous terrain and intricate river basin systems in the region are also susceptible to landslides and floods.

In 1998, Hurricane Mitch, whose devastating effects stretched across Central America, came to symbolize the region's vulnerability. The equivalent of one year's worth of precipitation fell in less than a week, prompting floods, mudslides and landslides. Some 10,000 people lost their lives. In 2010, the Atlantic hurricane basin experienced 12 hurricanes, including six storms rated category 3 or higher, causing an estimated 10 billion US dollars in damages.

Central America includes Belize, Costa Rica, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, and Panama. Caribbean includes Anguilla, Antigua and Barbuda, Aruba, Bahamas, Barbados, Bonaire, Saint Eustatius and Saba, British Virgin Islands, Cayman Islands, Cuba, Curaçao, Dominica, Dominican Republic, Grenada, Guadeloupe, Haiti, Jamaica, Martinique, Montserrat, Puerto Rico, Saint-Barthélemy, Saint Kitts and Nevis, Saint Lucia, Saint Martin (French part), Saint Vincent and the Grenadines, Sint Maarten (Dutch part), Trinidad and Tobago, Turks and Caicos Islands, and the United States Virgin Islands.

European Mediterranean

Natural climatic hazards in Europe, which are diverse and frequent, can take place any time of year. Storms and their associated floods often cause billions of dollars in damages – for example, those that took place in the United Kingdom in 2007, the lower Danube in 2006, the Alps in 2005 and central Europe in 2002. Europe also experiences other disasters such as the extreme heat-wave in 2003, which resulted in 70,000 deaths and more than 10 billion US dollars in damages.

Natural climatic hazards may cause elevated sea levels and seawater intrusions into estuaries and groundwater that adversely impact ecosystems. In southern Europe's coastal Mediterranean region, climate-related hazards, especially drought, can deplete groundwater supplies that are already over-exploited due to population growth and increased demand for water associated with tourism, industry and irrigation.

Water demand in the region doubled between 1950-2000, and is expected to increase another 15% by 2025, which by many experts is considered not sustainable. Climate models show a decrease in average rainfall of 4% to 27%, with particularly marked declines in summer.

The southern Europe's coastal Mediterranean region includes 21 countries, of which the Think Tank is focusing more on the particularly vulnerable countries of Spain, France, Italy, Slovenia, Croatia, Montenegro, Albania, Greece, Malta, Turkey and Cyprus.

South and South East Asia

Asia as a continent is prone to a broad range of natural hazards that cause a great deal of death and destruction. For example, a wind and storm surge associated with a tropical cyclone in the Gulf of Bengal in 2008 devastated the Irrawaddy delta, resulting in more than 140,000 deaths. Unprecedented levels of rainfall in 2009 drenched the Philippines creating widespread flooding and landslides. Southeast Asia experienced a devastating drought in 2009–2010. The tragic tsunami that struck on 26 December 2004, one of the largest ever recorded, killed more than 220,000 people in 13 countries on the coast of the Indian Ocean. Bangladesh (2007) and Myanmar (2008) were hit by tropical cyclones that left thousands dead and vast landscapes

flattened by wind and water. Nearly 40% of the world's largest and most densely populated port cities are in Asia, including many located on deltas vulnerable to coastal flooding. In Bangladesh, storm surges claimed 300,000 lives in 1970 and 140,000 in 1991. Flood shelters and elevated structures have been built to house flood victims. But it is not certain this will keep people out of harm's way (Jaspers et al, 2012).

South Asia includes Afghanistan, Bangladesh, Bhutan, India, Iran (Islamic Republic of), Maldives, Nepal, Pakistan, and Sri Lanka, while South-East Asia consists of Brunei Darussalam, Cambodia, Indonesia, Lao People's Democratic Republic, Malaysia, Myanmar, Philippines, Singapore, Thailand, Timor-Leste, and Viet Nam.

Steps in the Think Tank process

The CATALYST Think Tank approach is geared towards sharing current practices and progress towards best practices as mentioned above and in Gero (2011). Participation is voluntary and is described in this section in five steps, and also represented in Figure 3 below.

The first step is the start-up of the process. In a multi-regional discussion, the general approach for the Think Tank was defined, for all four regions, including an initial selection of relevant stakeholders to participate. Those who accepted the invitation to participate then recommended further stakeholders who were invited to participate, in what could be seen as a snow ball effect. The criteria for participation in the Think Tank included sufficient experience of several years in the focus themes of DRR and CCA and working in an NGO, governmental or intergovernmental agency, knowledge institute, and/or private sector (small/medium enterprise).

At this initial stage, thematic preparation for the regional processes took place. For instance, with the help of the EM-DAT database, an international disaster database (http://www.emdat.be), regional overviews were prepared with estimates of total damage, number of people affected, and number of casualties for the period 1975-2011, specified by disaster type (drought, earthquake, extreme temperature, flood, mass movement, storm, volcano, wildfire). This served to provide an overview of the order of magnitude, and the focus or main themes for each region.

In the second step, preparatory online discussions were initiated and a virtual meeting held to verify themes and compile initial views on current practices and best practices. This step took place in regional setting, i.e. four regional online discussions and four virtual meetings were held.

In the third step, further online discussions were held, and the initial planning of the all-important face-to-face workshops was initiated. In this step, the organizers of the regional processes undertook more desk research, and exchanged ideas and experiences, which contributed to a foundation document: report 'CATALYST Report on Capacity Development for Disaster Risk Reduction' (Jaspers et al., 2012), which is available for downloading from http://www.catalyst-project.eu/. The report provides the general framework for the project, and a description of current practices, research, networks and capacity development activities by region.

In the fourth step, the regional workshops were implemented, bringing together both

the Think Tank members, and the members of the consortium working on the Catalyst project. In a lively exchange, information regarding current practices were documented, and capacity development needs discussed.

In the fifth step, which at the time of preparing this paper, has yet to take place, the regional cycle of the Think Tank process will be formally completed and reconvene in a multi-regional setting. Meanwhile the regional discussions may continue online or in bilateral meetings, in an ongoing effort to document best practices. The overall output includes several synthesis reports on best practices in DRR/CCA, networks and gaps, recommendation for fostering capacity development and a training module on DRR.

Time frame of the Think Tank process

The Think Tank begins and concludes with a multi-regional process: with all the regional Think Tank members reconvening in a global Think Tank. Referring to the steps described in the previous section, the first step took about four months (started in Sep 2011), while steps 2, 3 and 4 took place over 6 to 12 months (with the workshops being held from Sept. 2012 - Jan 2013). The experiences of each of the four regions are jointly documented in two reports: a capacity assessment on DRR/CCA (Jaspers et al, 2012) and a workshop report (Hare et al. In press). After the workshop and formulating the lessons learned, the Think Tank returns to work together for the completion of key project deliverables in a multi-regional setting (planned for May 2013). In this way, the Think Tank is a shared experience for the stakeholders, leading to agreed capacity development products, whilst at the same time maintaining a regional focus with specific regionally-relevant products and guidelines.

Think Tank Resources and Dissemination

To support the Think Tank, an information archive of existing natural hazard-related DRR resources and research is being made available on the website www.catalyst-project.eu, so that all the compiled and synthesized information and knowledge is easily accessible to the community of researchers, practitioners and policy makers involved. It has been foreseen that at the end of the project, the archive will be transferred together with the website to an existing organisation concerned with DRR/CCA to ensure that it is maintained and enhanced, thus contributing to further capacity development in this field.

4. Results: Experiences with the think-tank approach thus far

European Mediterranean Think Tank and outcomes

At the moment the European Mediterranean (EUM) regional Think Tank comprises 17 members from nine countries.

The EUM region is the setting for a variety of natural hazards, that can be grouped into two main categories: geological hazards (seismic and volcanic hazards) and hydrometeorological hazards (hydrological and meteorological hazards) including

floods, landslides, and droughts. In the online discussion forum and the virtual meetings the focus was on these events and the state of the art on the occurrence of disasters in the region was discussed. In the workshop, earthquakes, floods and droughts were addressed, although special attention was given to droughts. The discussion focused on priorities, best practices as well as barriers to capacity development. Among the measures for dealing with drought and water scarcity were: (1) economic incentives; (2) adapting land use with a low water footprint; (3) improved monitoring of drought events; (4) acquisition and reuse of data, integrated with hydrological modelling; (5) long-term integrated research and improved translation of scientific knowledge to operationally applicable information; and (6) development of curricula for integrated drought management and accompanying training.

Concerning earthquakes, a number of policy lessons from the L'Aquila in Italy disaster were drawn. These include applying the precautionary principle and taking appropriate action to prepare for disasters when short-term forecasts of earthquakes are made, even if these are judged to be unreliable.

An overview with regard to capacity development can be found on the DRR Preventionweb platform (http://www.preventionweb.net). In Europe, there are a large number of UN organizations providing training, as well as knowledge institutes addressing research and policy needs related to both earthquake and floods/drought-related themes, e.g. CEDEM, METU, PPRD South, RELEMR, UNESCO-IHE, Wageningen University and Research Centre, UNU-ITC, IAMB-CIHEAM. These institutions focus on a range of highly relevant aspects, including governance, risk assessment, use of GIS and modelling, ecosystem based DRR, and others. The Think Tank members recommend that existing capacities be taken into account and more effort be placed in moving from learning to attitude and behavioural changes and beyond in capacity development activities.

The South East Asian Think Tank and outcomes sofar

There are 25 members of the South and South East Asia regional Think Tank from eight countries.

The initial process of data collection was drawn from the EM-DAT database analysis (http://www.emdat.be) in South and South East Asia. The main source of damage is flooding. In considering the number of people affected (by death, injury, or loss of home) by the various natural disasters, it is clear that floods are the primary source followed by droughts and storms. Most deaths are the result of earthquakes. For instance the large earthquake resulting in a tsunami in December 2004 claimed the lives of over 220,000 people. After earthquakes, most deaths are the result of storms and floods. A more detailed summary of the relevant EM-DAT information for this region has been included in Jaspers et. al. (2012).

In the online discussion and the virtual meeting in the South and South East Asia Think Thank process, it was indicated that overall, there is insufficient use of scientific knowledge in local risk assessments, due mainly to a lack of skills and access to information. Because the focus is mainly at the community level, simple participatory risk assessment approaches such as VCA are currently being used, leaving scope for including climate related information.

One member of the Think Tank suggested that knowledge about land use planning and flood zoning, management of floods, landslides, pollution management and control, as well as vulnerabilities and resilience from specific climate change impacts would be useful in this region for improving capacity development. Another Think Tank member suggested that CATALYST would complement well the efforts in the region by looking at risk perception by local government, local governance for risk reduction, and existing capacity development to address key elements of disaster risk reduction, integration of DRR in local development planning/budgeting, and the evolvement of Community-based DRR initiatives. It was noted that the Midterm Review of the Hyogo Framework of Action indicates that, while progress is being achieved at the national level, it lags at the local level because the lack of locally available resources and cultural aspects to ensure effectiveness in improving of capacity development.

Overall, think tank members from in the South and South-East Asia region agree that guidance on finding and accessing information, including that from scientific sources, is desirable. Best practices and capacity development activities would be useful in this region, but the focus should depend on the specific location. For example, for Himalayan mountain areas it was suggested that capacity development activities, coupled with best practices, would work well. One Think tank member suggested that capacity development should strengthen the link between the managers and the practitioners working on DRR and climate change in general, thus supporting the remark of a think tank member operating in Indonesia, that there is a need, from the outset, for linking indicators directly to CCA initiatives.

A workshop was hosted by the United Nations Economic and Social Commission for Asia and the Pacific (UN-ESCAP) at the UN Conference Centre in Bangkok from 23 to 25 January 2013. Lessons learned and recommendations are now being formulated to develop ways to transform current practices to best practices and possibly to operationalize best practices using state-of-the art scientific knowledge.

One of the paths for for future capacity development identified, is the further development of education materials that will be available on internet, referred to as the 'online curriculum'. For such an online curriculum, the target group are the experts with a university background managing DRR/CCA at intermediate level. Potential topics include how to prevent, respond to, and prepare for disasters such as floods, droughts and earthquakes (figure 1), how to deal with uncertainties and complexity especially in decision making and communication, and how to take scientific and non-scientific climate (change) related information into account. The curriculum could include a training block related to the development of an 'enabling environment', 'institutions', 'guiding processes at community to district level', as well as a 'train-the-trainer course'. The latter is to be included as it is expected that many people following the training, will wish to share the knowledge gained within their own setting (in their own language) with colleagues. Taking advantage of earlier experiences on the development of open course ware, methods could include presentations featuring state-of-the-art knowledge, abstracts linked to articles, question and answer formatted information and the option for online discussion (Terwisscha van Scheltinga et al, 2009). Further development of such an online resource into capacity development trajectories combining the online curriculum with face to face education and training options is recommended and will be further

worked out with the help of Think Tank members' suggestions.

5. Discussion and conclusion

The approach described here with the CATALYST Think Tank is an innovative way of bringing various experiences and different types of knowledge from scientists and practitioners with different backgrounds, cultures and sectors (both DRR and CCA) together. This has advantages and disadvantages. An advantage of having stakeholders involved on a voluntary basis is for instance that only those individuals who wish to be involved will make the effort and time. It attracts those who are directly involved in the relevant fields of work, and whose experiences provide a direct benefit to the knowledge base. Stakeholders with hands-on work experience have contributed with information about current practices and are also able to make recommendations based on their experiences of what they consider to be best practices. Bringing these individuals together is quicker than what researchers can do with research and inventory alone. In particular, the 'reality check' aspect is important, as many Think Tank members are working in a practical setting, bringing experiences from diverse countries to the table. This benefits the identification of best practices as well as gaps and barriers.

A disadvantage of working with the method as it is, is that the selection of participants and the linkage to estimated uptake of knowledge / implementation of selected strategies is difficult to estimate at the beginning of the process. The process is rather short in time (2 year), thus stressing the need for quick results. At this point in time the use of the Think Tank approach has not yet been tested in specific situations, e.g. best practice approaches for river and flood management with. At the same time, it is important to note that current developments in the field of DRR and CCA are rapid and it is useful to document these changes as they occur, and at the same time, continuously search for ways and means to bring together various types of knowledge, at different scale and governmental levels.

In conclusion, in the quickly changing setting of DRR and CCA, and in the process of mainstreaming both DRR and CCA in (sustainable) development processes, the Think Tank approach, which is intended to continue beyond the lifetime of the project. forms a means to identify and bring together different types of knowledge, from different fields of expertise (both DRR, CCA and SD). Capacity is created to address DRR/CCA in an integrated manner by creating best practices documents, among others the development of a web-based resource, including an online curriculum, thus effectively using the even increasing wealth of knowledge.

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Figures

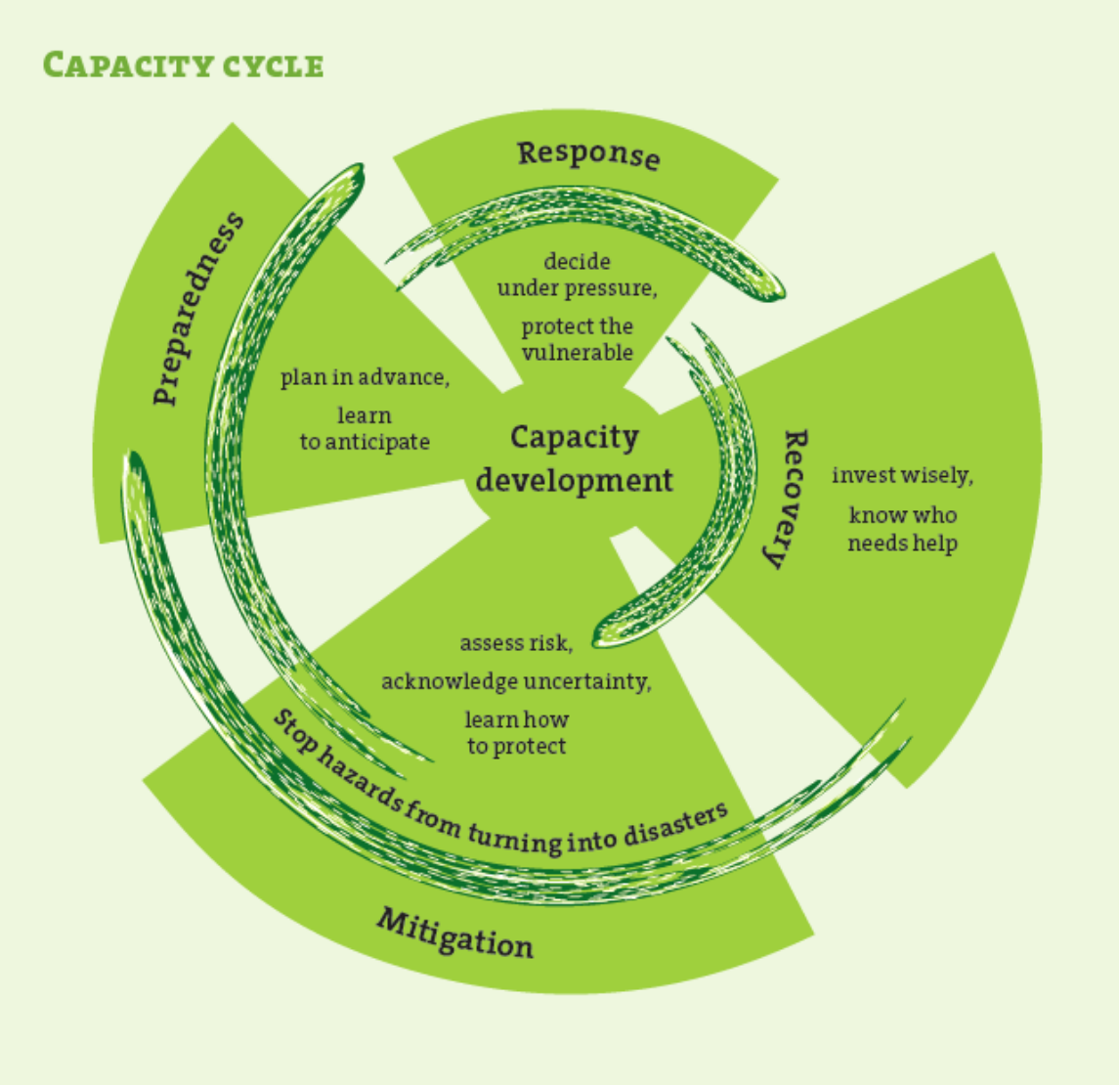

Figure 1: Capacity development cycle in Disaster Risk Reduction and Climate Change Adaptation

Figure 2: Regions covered in the Think Tank Approach for DRR/CCA capacity development

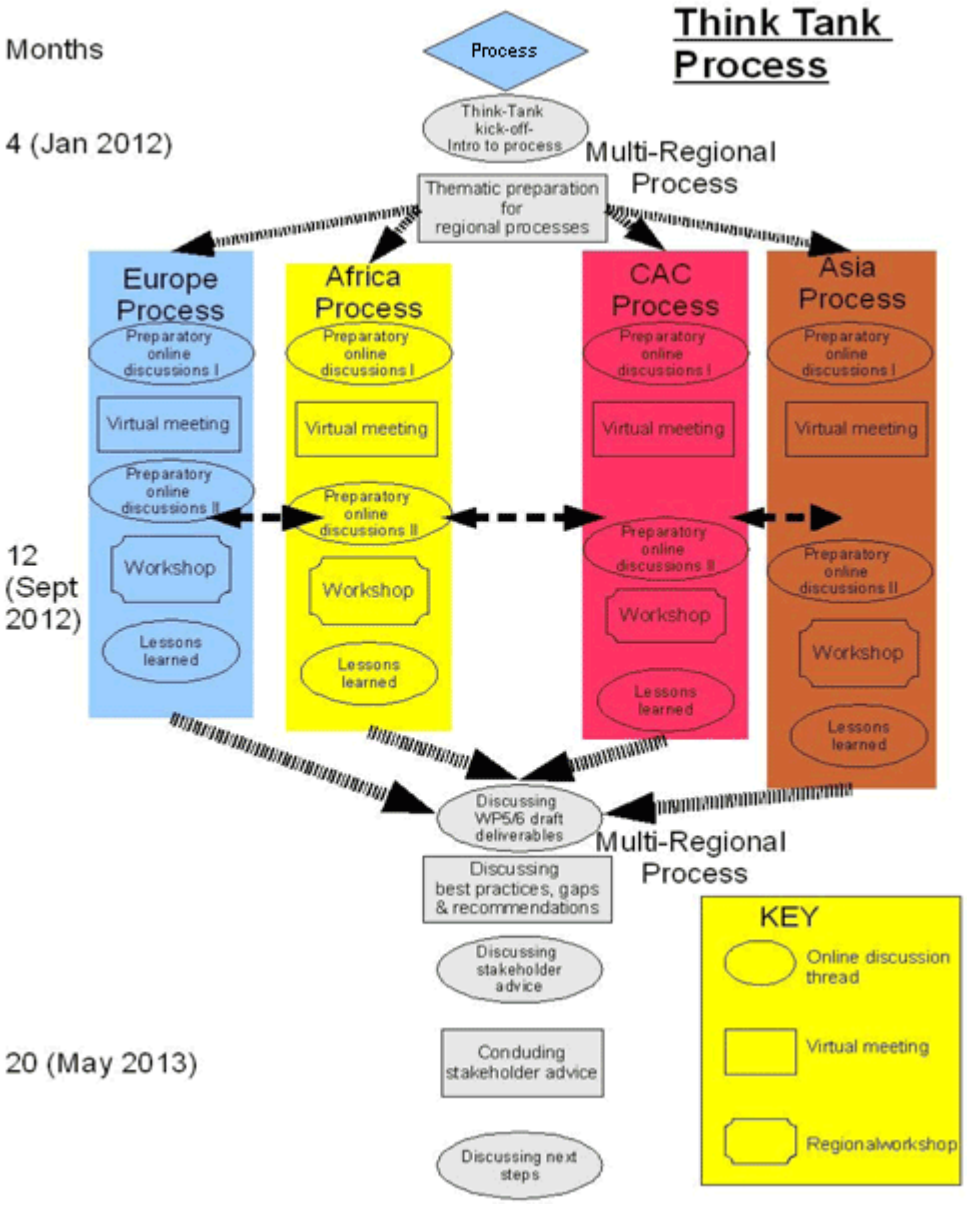

Figure 3: Think Tank process for capacity building in DRR/CCA