GLOBAL LEARNING EVENT 2016

Risk management solutions and tools (climate models, risk assessments, insurance schemes, adapted technologies, etc.) as a response to the adverse effects of climate change

AGENDA | 12-14 SEPTEMBER 2016

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1. Introduction

The direct risks of climate change are known. These include more severe and more frequent extreme climate events (such as storms, hurricanes, or heat waves), erratic changes in precipitation patterns, and a rise in global sea levels and temperature. Climate change poses global risks that are able to fundamentally change our economic and social systems.

While we may be able to identify effects of climate change, such as desertification or an increase in crop failures, its precise impacts are far from predictable. Notably, on societal consequences of climate change in the decades ahead, different experts who assess climate change risks often reach very different conclusions[1].

Climate change will occur over a long time horizon. Studies that aim to understand the impacts and benefits that result from variability in the climate today, can be important in helping to reduce uncertainty surrounding the consequences of future climate change. Another challenge is to integrate information from risk assessments and climate predictions into practical development planning and activities.

As such, climate change should be approached as a risk management problem, whereby climate policy shall be supported so as it limits the probability of an undesired and detrimental outcome to a reasonable value. But for human societies to yield a greater capacity to deal with climate impact, other dimensions shall be put into the equation, including information derived from our scientific and technological capabilities, but also embracing existing social and cultural abilities.

This paper serves as an introductory framework for the discussions to be held on the topic "Risk management solutions and tools as a response to the adverse effects of climate change", for the Global Learning Event of the Global Climate Change Alliance+ (GCCA+) that will be held in September 2016 in Brussels.

2. Context

The hidden costs of climate change

Evidence shows not only an aggregate rise in climate change-implicated disaster events globally, but also that this rise is quick and recent. The average of 400 natural disaster events annually across the globe in the 1980's passed to 630 in the 1990's and 730 in the 2000's. In 2007, there were 960 catastrophic events, of which 91% were disasters in which climate change may be implicated (i.e. other than earthquakes and tsunamis)[2]. It is expected that these events will occur even more frequently in the future[3].

[1] Climate Change Risk Management, American Meteorological Society, Policy Program Study, 2014

[2] IAIS 2008, pp. 15-16

[3] Carter, et al., 2007

A disproportionate share of economic and human burden already fall on low-income and lower middle-income countries. In the past quarter century over 95% of deaths from natural disasters occurred in developing countries. While the direct economic losses reach an average of about 0,5% of the national income at world level, this figure is at least double in low-income countries[4], and can be multiplied by 14 in the case of some Small island developing states (SIDS) like Vanuatu[5,6]. The Global Assessment Report 2015[7] indicates that "future disaster losses represent *an existential threat* for Small island developing states (SIDS)".

Prospects indicate that more climate action is needed. Direct economic losses from disasters such as earthquakes, tsunamis, cyclones and flooding are now reaching an average of EUR 225 billion to EUR 270 billion each year[8]. Losses due to extensive risk (i.e., minor but recurrent disasters risks) reached an average of EUR 90 billion per annum in the 2000's (globally) and are expected to reach EUR 143 billion by 2050. Africa, the continent with warming deviating most rapidly from "normal" conditions, could see climate change adaptation costs rise by *EUR 45 billion per year* by 2050, even assuming international efforts keep global warming below 2°C this century. It is not only a question of money. Global warming of 2˚C would also put over 50% of the African continent's population at risk of undernourishment. Yet, the IPCC showed that without additional mitigation we are heading to 4˚C of warming[9].

With regard to inaction, i.e. if governments decide against any form of action to combat the impacts of climate change, the cost of inaction in the Caribbean alone is projected to amount to over EUR 20 billion annually by 2050 – equalling 10% of the current size of the Caribbean economy[10].

Elements on main EU policies and tools towards risk management

The EU is a strong promoter of sustainable development and decision-making that takes full account of environmental and climate change risks. The European Consensus for Development and the Agenda for Change (2011) serve as the basis for tackling climate change as one of the global challenges increasing the vulnerability of developing countries and for which more action is needed.

EU support builds upon available vulnerability assessments and on the needs and priorities expressed in partners' national development and adaptation strategies **or plans**. The EU also advocates a move towards the use of evolving and integrated strategies such as **National Adaptation Plans or Nationally Determined Contributions**.

[4] Munich Re research programme, data 2007.

[5] DARA and the Climate Vulnerability Forum, Fundación DATA Internacional, 2010.

[6] If damage and loss of capital are both taken into account, this figures reached USD 6.9 billion in the ACP area in 2014, a 2.3% of the combined GDP (data: United Nations International Secretariat for Disaster Reduction, 2014)

[7] UNISDR with the main support of the EU, UNDP

[8] Global Assessment Report on Disaster Risk Reduction, Making development sustainable: the future of disaster risk management, UNISDR, 2015

[9] 5th African Ministerial Conference on the Environment (AMCEN), 2015, Africa's Adaptation Gap, UNEP

[10] Small Island Developing States – Climate Change edition 2015

Climate models are essential to make predictions and act as a basis for decision making. The EU has established regular dialogues with partner countries on science, technology and innovation. For example, the EU Africa High Level Policy Dialogue allows for the exchange of information of good practices, joint priority setting and implementation of activities in the areas of earth observation data, prediction, climate services and climate adaptation approaches (e.g., MESA, ASMED projects).

The Sendai Framework for **Disaster Risk Reduction** 2015-2030 aims at the substantial reduction of disaster risk and losses. It promotes (i) the prevention and reduction of hazard exposure and vulnerability to disaster, (i) increased preparedness for response and recovery, and thus (iii) strengthened resilience. Priority is to understand disaster risk, as a preamble to enhancing disaster risk governance. As such the EU Action Plan on the Sendai Framework for Disaster Risk Reduction 2015-2030[12] identifies key areas related to the four Sendai priorities, notably: building risk knowledge in EU policies; and promote an all-of-society approach in disaster risk management; leading to better risk informed investments.

The EU has been supporting 40 countries to build and improve National Disaster Loss databases for disaster loss accounting, 30 countries in capacity building to develop probabilistic risk assessments and 15 countries in integrating disaster risk reduction and climate change adaptation in development and public investment planning. The EU also supported the preparation of the Global Assessment Reports (GAR 2011, 2013 and 2015) by the UNISDR[13], by providing the means to conduct modelling and investigate natural disaster risk from the national to the global level.

As such, progress has been made in global **climate and disaster risk assessment**, for instance through the creation of an Index for Risk Management - INFORM[14], and risk assessment tools developed to support decisions about natural crisis and disaster prevention, preparedness, response and resilience. The 2015 Compendium of Risk Knowledge was developed through the 10th European Development Fund, mapping risks in all African, Caribbean and Pacific (ACP) states[15].

The Bali Action Plan launched at the United Nations Framework Convention on climate Change (UNFCCC) Conference of Parties 13 (COP13) in 2007 aimed at a set of decisions that represented the various tracks that were seen as key to reaching a global climate deal. It specifically called for "consideration of **risk sharing and transfer mechanisms, such as insurance**" as a means to address loss and damage in developing countries particularly vulnerable to climate change. The Munich Climate Insurance Initiative (MCII) was started in 2008 in response to the growing realisation that insurance-related solutions can play a role in adaptation to climate change. It is primarily based on ex-ante climate risk management assessments that place priority on preventing human and economic losses[16].

[11] African Monitoring of the Environment for Sustainable Development (AMESD), Monitoring for Environment and Security in Africa (MESA), http://rea.au.int/mesa/node/78

[12] SWD(2016) 205 final/2

[13] United Nations Office for Disaster Risk Reduction

[14] www.inform-index.org

[15] https://ec.europa.eu/europeaid/sites/devco/files/acp-compendium-risk-2015_en.pdf

[16] http://www.climate-insurance.org/home/

Ecosystem-based adaptation (EbA) implies: "sustainably managing, conserving and restoring ecosystems, to provide the services that allow people to adapt to climate change."[17] By boosting the resilience of natural ecosystems, eco-services and its benefits to human, societies can overcome the adverse impacts of climate change. While the concept of EbA is relatively new, its application in the field are known, including: sustainable water management where river basins, aquifers, flood plains and their vegetation are managed to provide water storage and flood regulation; or sustainable management of grasslands and rangelands, to enhance pastoral livelihoods and increase resilience to drought and flooding. The establishment of diverse agricultural systems, incorporating indigenous knowledge, and maintaining genetic diversity of crops and livestock, is also considered ecosystem based adaptation techniques.

The Economics of Ecosystems and Biodiversity studies indicate that an annual global investment of EUR 41 billion into ecosystem protection could deliver an estimated EUR 4.5 trillion a year in benefits. At a more specific level, it is estimated that a EUR 18 billion investment in reducing deforestation could reduce greenhouse gas emissions by 10% while securing livelihoods and reducing poverty in tropical countries[18].

Adapted technologies at sector level are also part of the risk management toolkit. Specific sector notes developed by the EU, together with the Guidelines on Mainstreaming Climate Change and the Environment in Development Cooperation[19], are key documents to identify risks and hazards, and opportunities in the sectors such as: agriculture, water, energy, health, etc. Notably, the Guidelines include full guidance on project climate risk screening and the implementation of Climate Risk Assessments (CRA).

Identified political, institutional and social barriers.

Described as a "wicked problem"[20], as a public issue climate change is characterized as being related to problems so deep that we are not used to them (e.g., the scale of human activities relative to the earth system). However, we will have to live with climate change, and given that climate issues have no boundaries, and that emissions anywhere in the world contribute equally to climate change, there is a genuine need to implement coordinated approaches. Conversely, the same argument can be taken against action: why should one nation begin to reduce its emissions when its neighbour has no intention to do so?

These challenges are exacerbated at the international level. Indeed, most exposed countries are also least developed economies, meaning that countries may have a sense of urgency to respond to climate change without having the capability of doing so. This situation also contributes to the complex ethical dimensions of climate policy.

[17] Definition of the International Union for the Conservation of Nature (IUCN)

[18] www.teebweb.org

[19] http://ec.europa.eu/europeaid/sectors/environment/environment-and-green-economy/climate-change-and-environment_en

[20] Rayner, 2006

Potential technical solutions described above can contribute to robust adaptation, but it is necessary to recognise their main flaws.

- **Climate models**, while improving drastically in the recent years, are still under development and cannot be considered fully accurate[21]. Plausible estimates for probabilities, and possible impacts, of catastrophic outcomes, could be less complex and as useful. Another difficulty remains, which is to **ensure the evidential roles of climate models in policy making**[22].

- **Disaster risk response** is highly dependent on political contextual factors. In fragile states, weak state accountability and government responsiveness means that programmes aiming to work at a regional or local level may encounter a missing connection between central government and local authorities[23]. Further, **Disaster Risk Assessments** may also be poorly used, or not in line with the adaptive capacity needs of local authorities and communities targeted, not allowing success of adaptation interventions. Also, it was found that international adaptation funding modalities are not optimal in addressing root causes of vulnerability or support local transformations[24]. This suggests that the causes for the lack of integration of data available from risk assessments and climate modelling at local level should be better understood.

- Despite high expectations, **the insurance industry alone will not provide the solution to the management of climate risks**. The case of flood insurance in Europe (e.g., in the UK[25]) illustrates these challenges: even national government and industry together cannot fully address these risks and **other actors need to be involved** to create strong incentives for risk reduction. In African countries, uncertainty of income, and weak institutions operating with policies that do not consider the realities of the targeted beneficiary communities, are seen as key challenges to **climate-insurance preparedness**. This implies more capacity building and awareness raising is needed at both demand and supply sides prior to the implementation of sound insurance schemes.

- **Ecosystem-based adaptation initiatives** also face a range of barriers. Ecosystem services (including watershed functions, forest for timber or other products, or land for farming), are managed by diverse stakeholders that may not work in a coordinated way. EbA also requires strong consultation and engagement with the people that depend on the resources. This may be hindered by the inability of local communities to participate in forums where the decisions on ecosystem management are being undertaken.

[21] "What do climate models tell us?", R.S. Pindyck, Journal of Economic Literature 2013, 51(3), 860–872, 2013

[22] "The Roles of Climate Models: Epistemic, Ethical and Socio-Political Perspectives", Eindhoven, The Netherlands, 2013

[23] Strategic Research into National and Local Capacity Building for Disaster Risk Management - Zoë Scott, Roger Few, Jennifer Leavy, Marcela Tarazona, Kelly Wooster and Mireille Flores Avila, Oxford Policy Management, 2015

[24] Barriers to reducing climate enhanced disaster risks in Least Developed Country-Small Islands through anticipatory adaptation. Natasha Kuruppu, Reenate Willie, 2014

[25] Strengthening insurance partnerships in the face of climate change – insights from an agent-based model of flood insurance in the UK, F CRICK, K JENKINS S SURMINSKI, June 2016

3. Some GCCA+ experience and lessons learned

GCCA+ supported actions include, among others, structural action that allows to mitigate risk by having multi-stakeholder approaches (e.g., at geographical level as with the GCCA support to the Mekong River Commission; or through multiple institutions as with the Local Climate Adaptive Living Facility - LoCAL), diversifying livelihoods (e.g., through Budget support in Bhutan), improving access to information (e.g., GCCA programmes in Rwanda, Tanzania), enhancing land management in coherent ecosystemic areas (e.g., GCCA support to coastal zones in Cambodia or in Guyana), and reducing disaster risks (notably, in SIDS).

Risk management in GCCA+ projects is also performed at sector level, such as in agriculture where specific adaptation techniques are promoted such as agroforestry (GCCA support in Timor Leste), climate smart agriculture (Mauritius) as well as soil and water conservation (Nepal, Ethiopia).

Lessons learned include:

- Decision-makers should consider identifying benchmark levels of climate risk, against which action is to be undertaken. Such benchmarks may be based on "reference" climate events (e.g. periods of significant drought or excess rainfall). Such benchmarks provide a basis for developing on-the-spot and more detailed risk assessments so as to develop a tailored response.

- It is important to keep in mind that adaptation options may need to evolve in the future, as their performance may diminish with the increased effects of climate change.

- An objective of climate change risk assessments should be to identify "no regret" climate adaptation options. Such options are anticipated to deliver benefits under any predicted climate scenario.

- It is advised demonstrating "win-win" or "no-regret" actions with clear benefits as early as possible, and communicating climate change and adaptation measures in an appropriate context, to help establish good relations with targeted communities.

- In case "no regret" options are not available, the choice of climate management options will remain uncertain. In these cases, the mainstreaming of climate change risks into sector and local planning remains a sound mitigation strategy.

4. Way ahead

Research and scientific assessments can help reveal risks and opportunities associated with the climate system and support decision-making with respect to climate change risk management. Expanding the knowledge base allows both policy makers and targeted policy beneficiaries including communities to understand, select, and improve specific risk management strategies and thereby to increase the effectiveness of their risk management efforts.

How to bridge the gaps still existing between science-based climate data and risk tools on the one hand and the end-users and decision-makers on the other hand?

Climate-influenced decisions include decisions that could be taken to exploit the opportunities and/or avoid the threats associated with climate change. Taken together, field tests and local knowledge, technical developments at sector level, combined with services relating to climate, can effectively support efforts to meet basic human needs such as the provision of food, shelter, energy, health and safety, helping to create new opportunities for social and economic development.

What should be done more to effectively promote lessons from successful research and capacity building pilots and are made available for different levels of decision making from the national to the local level? How to scale up impacts of best practices/successful projects and actions, given the increasing demand for implementation at a large scale?

Any of the risk management options described above is probably insufficient if self-standing, and none excludes the use of other options. Indeed, a sound climate change risk management system should probably include a combination of policy responses. Policy choices, however, should not only integrate objective information about the climate system, but also how well it shall be used. This depends on the relationship of the end user with the proposed solution, which can be influenced by many factors, including social and cultural ones.

As such what mechanisms should be used to ensure the available data is 1. Translated into user-friendly, and locally accepted information, 2. Reaching the appropriate user 3. with the right information and tools for support for investment decision making?

When trying to answer to these questions, participants may also gather information on the following points, in the context of their own country:

- Which level of information do you have on how the climate may change? On its probable impacts on your sector?
- Do you know of any risks arising in other sectors, that might negatively impact on your sector?
- Overall, were risks valued?
- Were steps taken to reduce these risks?
- Finally, would you consider a sound risk management strategy and/or solutions is taking place?

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