Reducing climate risk: adaptation and vulnerability

Adaptation to climate change is a major focus of SEI's work. Our researchers have been leaders in examining the drivers of adaptive capacity and vulnerability, and in developing methods and tools for assessing vulnerability, planning adaptation, and sharing knowledge.

Key insights

SEI's adaptation work falls into three main categories: research on adaptation and vulnerability; technical support for policy-makers, planners and adaptation practitioners; and capacity-building, including the knowledge-sharing platform weADAPT and network-building and outreach in Asia. Below are some of the key take-home messages in our work across those three categories:

- ***Vulnerability to climate change is dynamic and based far more on development conditions (social, economic, institutions) than on exposure to climate risks.***

A great deal of the political discourse on vulnerability – such as in the context of adaptation finance and, more recently, on loss and damage – treats vulnerability as a function of climate impacts: the places most exposed to droughts, floods, sea-level rise and various disasters are presumed to be "most vulnerable".

Yet in reality, while the severity of hazards clearly matters, it is the underlying conditions that determine whether people can withstand climate impacts: Are they poor or well off? Can they move if they have to, or find a new livelihood? Do they control their own fate, or are they beholden to others? Are there strong institutions to support them? Is the government stable and acting in everyone's best interest? These conditions also change over time, with development, political shifts, etc. – and this affects vulnerability.

This insight has broad policy implications. It calls into question any claim that a country is "particularly vulnerable" because of its exposure to climate hazards. It complicates discussions of attribution of climate damages and relative responsibility: Even if wealthy nations were to blame for almost all climate impacts, they didn't cause extreme poverty, civil wars or corruption. And for national and local governments, such as in Nicaragua, El Salvador, and Quito, Ecuador, where SEI has recently worked, it means adaptation (and climate-related disaster risk reduction) requires not just shoring up infrastructure and improving emergency systems, but also confronting fundamental socioeconomic and political issues.

- ***Development and adaptation are inextricably linked, so forcing distinctions between them is likely to be counterproductive. At the same time, development and adaptation will not necessarily support each other; it takes a concerted effort to build synergies and avoid conflicts.***

Climate finance is meant to be "new and additional", not just repurposed development aid. Conversely, finance recipients are under pressure to show they're spending climate funds on climate-specific projects. This can favour technological solutions that focus narrowly on climate risks – e.g., building dikes – over projects that focus on the drivers of vulnerability, which overlap with development (Klein 2011).

A women's focus group doing community mapping in Ha Tsiu, Lesotho.

SEI has helped illuminate adaptation-development linkages on multiple levels: through our journal *Climate and Development*, which offers perspectives from around the world (including a special issue on international mechanisms for linking climate and development policies); analysis on the integration of adaptation and development finance (Klein 2010); country-specific analyses (e.g. Mozambique and Ethiopia); guidance on "mainstreaming" adaptation into development planning (Lebel et al. 2012); and exploration of specific sectors (e.g. forestry in Bhutan). SEI's academic writing on these issues has been extensively cited, and projects such as the Asia Adaptation Knowledge Platform (AKP) and weADAPT (described below) have brought those insights to researchers, policy-makers, donors and civil-society organizations in the developing world.

- ***Adaptation has limits – both in the natural world and in society – and in real life, it is almost certain to be sub-optimal, even when adaptive capacity is high.***

SEI has built on this insight in several important ways. In an in-depth analysis for the UK's AVOID programme (Warren et al. 2012), SEI explained why those limits make it impossible to replace "1°C of mitigation" with "1°C of adaptation": Adaptation can't protect us from the most severe long-term climate risks, or make natural systems recover after crossing critical thresholds; most countries, even wealthy ones, are starting with adaptation deficits (such as poor coastal protection); policy-makers are often reluctant to act in the face of uncertainty, so adaptation tends to be reactive, not proactive (see also Benzie et al. 2012).

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A coffee farmer near La Celia, Colombia, rakes coffee beans laid out to dry.

As part of the NORD-STAR programme (discussed more below), SEI identified bottlenecks that are keeping Nordic countries from translating adaptation research insights into action – ranging from the uncertainty problem, to mismatches in the time-frame, spatial scale and conceptual framing of research vs. policy-makers' priorities and needs (Klein and Juhola 2013). Addressing these bottlenecks will increase the impact of research and help produce more effective policies.

SEI has also shown that culture and religion can help or hinder adaptation, and has worked to identify knowledge gaps and to illuminate the policy context and political framework in which adaptation occurs. In addition, SEI has examined adaptation in the context of a globalized economy, and the potential for measures in one place to increase vulnerability in another (Atteridge and Remling 2013). Ongoing work led by the SEI-US Water Group, meanwhile, is applying decision science, data visualization tools, and robust decision support methods to help policy-makers deal with uncertainty in adaptation strategies.

Other major activities

SEI's Richard Klein is a coordinating lead author in IPCC's Working Group II , and SEI's highest-profile work on adaptation and vulnerability has been its contributions to the 2011 *Special Report on Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation* (SREX) and work on the *Fifth Assessment Report*. Other major projects and activities include:

- weADAPT.org, launched by SEI-Oxford in 2011 (formerly wikiADAPT.org since 2005), is an online "open space" on adaptation that allows practitioners, researchers and policy-makers to access high-quality information and to share experiences and lessons learnt. Not only is it a rich and valuable contribution in itself, but SEI has engaged in additional projects to expand weADAPT's reach, connect it with other resources, explore how users interact with the site, make improvements, and collaborate with other knowledge-brokers to maximize their impact. This work was presented at both COP17 and COP18.

- The Regional Climate Change Adaptation Knowledge Platform for Asia (AKP), a Sida-funded project, supported an array of innovative research in 13 countries, including pilot projects in Bangladesh, Bhutan, Cambodia, Nepal, Thailand and Vietnam, and scoping assessments in Bhutan, China, Indonesia, Sri Lanka, Malaysia, Lao PDR, and the Philippines.

Though AKP encountered many challenges – not least due to the engagement of research partners who spoke at least a dozen languages, had very different backgrounds and skill sets, and worked in very different countries and organizations – it also produced a rich collection of work and, in the process, engaged a wide range of stakeholders at all levels. And while AKP did not fully succeed in mainstreaming adaptation into any of the participating countries' plans and policies, it did yield valuable lessons and established a platform for knowledge-sharing and a community of practice, which has "sown the seeds" for future action (Salamanca and Davis 2013).

- The Nordic Centre of Excellence for Strategic Adaptation Research (NORD-STAR) pursues the vision of a Nordic region that can adapt to the inevitable consequences of climate change and the unintended consequences of climate policy. The programme's scope thus extends well beyond the traditional interpretation of adaptation – SEI participants focus on bioenergy and climate finance as well. SEI is part of several NORD-STAR projects and also manages the network's communications.

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Villagers on the edge of Tonlé Sap, in Cambodia, have built their houses on stilts to stay above water during the rainy season.

• Mistra-SWECIA, which straddles the governance and climate themes, is a major Swedish research programme on climate impacts and adaptation, spanning climate science, biology/ecology, economics, and social sciences. SEI leads the project "The Process of Adaptation to Climate Change", which has provided insights on determinants of adaptive capacity in developed countries and climate issues in Swedish forestry (Ulmanen et al. 2012), among other topics. The latter also laid a foundation for new work on trans-boundary climate impacts and adaptation needs (Benzie et al. 2013).

• SEI's work evaluating methodologies for vulnerability assessment and adaptation identification – including the comprehensive *Review of climate change adaptation methods and tools* (Schipper et al. 2010) produced for the Mekong River Commission – has been widely cited in policy discussions. It shows that despite a proliferation of such tools, most are of little help in practice, as they require significant resources, specialized training and facilitation, they are not backed by appropriate literature, and they provide only incomplete pictures, and they cannot replace expert judgment.

• SEI has also helped show how to conduct better assessments. In Quito, Ecuador, we developed and tested an indicator-based approach to gauging vulnerability and measuring the effectiveness of adaptation measures. SEI has also advanced mixed-method, bottom-up approaches to vulnerability and adaptation assessment to address the dynamic nature of social vulnerability and multiple interacting stressors that can inhibit adaptation, in work funded by the Netherlands Climate Assistance Programme and a case study of Lesotho. More recently, SEI-Oxford has integrated ecosystems-based approaches in assessments of adaptation needs in Tanzania and Belize.

• Working under the auspices of UNEP's Programme of Research on Climate Change Vulnerability, Impacts and Adaptation (PROVIA), SEI led and co-authored an update of guidance for assessing climate vulnerability, impacts and adaptation (PROVIA 2013). The goal was to help researchers, adaptation practitioners, decision-makers and those involved in policy formulation sort through the wide array of methods and tools available. SEI presented the guidance at COP19 and has since developed a brochure on how to use the guidance to support the National Adaptation Plan process.

• SEI pulled together multiple aspects of its adaptation insights and expertise in a concept note intended to guide the development of Indonesia's Climate Change Adaptation Action plan (RANAPI). SEI's work outlined key issues that policy-makers must address at the outset, starting with the definitions of "risk", "vulnerability" and "adaptation", which can have profound implications. We also dealt with issues of uncertainty; the balance between planned and unplanned (autonomous) adaptation; and strategies for avoiding "maladaptation" – adaptations that exacerbate vulnerability or limit future adaptive capacity.

• SEI has contributed to the increasingly recognized and well-attended Community-Based Adaptation conferences over the years through panel presentations and participation. The Global Initiative on Community Based Adaptation (GICBA) emerging from these conferences and its Community Based Adaptation Layer are both hosted on weADAPT and are showcased at the conference every year.

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Farmers in Trinidad, Bolivia, grow crops on "camel humps" that protect plants during flooding and capture water in adjacent channels.

New research and future pathways

In acknowledgment of the importance of socio-cultural dimensions of vulnerability to climate change and natural hazards, there is a growing demand to shrink the knowledge gap. It is crucial to understand how society and culture influence our attitudes and behaviour toward these risks. We want to continue to research the challenges and opportunities posed by socio-culturally derived world views. By better understanding local cultures, we aim to identify how risk and vulnerability reduction might be encouraged without threatening existing beliefs. This includes not only further work on behaviour and culture, but also exploring how gender plays a role in defining vulnerability and adaptation strategies. SEI is eager to put greater emphasis on gender in the future, and has strengthened our expertise on gender, development and adaptation.

Through Mistra-SWECIA, we are expanding our research to specifically understand and support Swedish private-sector adaptation to climate change; we are also looking at adaptation in private-sector forestry. In addition, SEI is examining the indirect effects of adaptation and development interventions, starting with a look at production of globally traded commodities such as coffee and cocoa, which are important income and livelihood sources for many developing countries. Global trade means the vulnerabilities – and adaptive measures – in one country can affect others producing the same commodities. SEI's goal is to provide guidance to development and climate adaptation practitioners on how to "set the lens wider" in setting up projects or programmes.

At SEI-Asia, meanwhile, priorities for future adaptation research are 1) understanding the barriers to adaptation at the sub-national level – how to make adaptation work better at village, community, local or provincial levels; and 2) understanding the political ecology of disaster and risk: how are "risk" and disasters governed, and how does that impinge on the ability of villages and communities to adapt?

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Coastal erosion and inefficient erosion reduction measures on the beach at Milnerton, Cape Town, South Africa.

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Published by:
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2014

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