

Building Knowledge to Support Adaptation: Lessons from the Regional Climate Change Adaptation Knowledge Platform for Asia

Key Findings

- National-level knowledge about projected climate change impacts, sectoral implications, drivers of vulnerability, and potential adaptation measures varies greatly across Asia. Some countries – especially those which have faced major hazards and risks, such as the Philippines and Bangladesh – have built a significant knowledge base, while others still have little to work with.
- Across all countries we have studied, knowledge about climate change and adaptation at sub-national levels is far more limited, especially at the local level. To some extent, this is due to systemic failures: lack of capacity-building and training, and inadequate knowledge dissemination mechanisms. However, much of the needed knowledge simply does not exist yet – from meteorological records, to hydrological models, downscaled climate models, region-specific agricultural research, and vulnerability assessments.
- Language is a major barrier, and there is a strong need for materials in national and local languages. Most published climate and adaptation research is in English, and even in national government agencies and research organizations, English-language skills are often limited.
- Climate research is often framed in ways that are difficult for policy-makers, planners and practitioners to grasp, and that doesn't answer questions they consider crucial. This is particularly true regarding climate uncertainty, which in turn hinders action. There are tools that can help, such as scenario analysis.
- Local knowledge and traditions are crucial for effective adaptation, but are sorely under-represented in most countries' current adaptation knowledge base. Participatory processes that combine capacity-building with knowledge generation can help bridge these gaps.
- Knowledge is not just about information, but also about skills and tools and building capacity for generating, reviewing and improving knowledge bases. An important aspect of building knowledge for adaptation is to field-test tools and methodologies, identify those best suited to specific needs, and build local capacity to use them for information-gathering, analysis and planning.



Traditional knowledge plays an important role in adaptation. Above, fish habitat development rings, long used by farmers in Bangladesh, are installed in a rice field in Jhalokhati district.

The Regional Climate Change Adaptation Knowledge Platform for Asia (AKP) grew out of a recognition that countries across the region faced potentially dramatic climate change impacts, but lacked the knowledge and capacity to effectively reduce vulnerability and plan for a more climate-resilient future.

AKP set out to fill this gap by building a strong network of local researchers to gather new knowledge on the ground, bring world-class adaptation expertise to the stakeholders who need it, test new approaches, and share the results with their peers, decision-makers and civil society across the region.

This policy brief draws on AKP's work since 2009, with a special focus on country-level scoping studies of adaptation research, capacity-building and other needs; a 2011 desktop study assessing capacity gaps and needs across East Asia; and insights from the Knowledge Management Workshop on Harnessing Adaptation Knowledge in the Asia Pacific Region, held in Bangkok in February 2011. Along with general lessons, we also present some examples from specific countries to show the diversity of knowledge needs.

A gap between knowledge and practice

Research on climate change impacts, drivers of vulnerability, and adaptation has advanced considerably in recent years, globally and within Asia. The Intergovernmental Panel on Climate Change (IPCC) has published a wealth of material, including country-specific projections; governments have conducted their own assessments, often with international support; and research institutes and NGOs have produced numerous reports and shared knowledge at regional conferences, workshops and seminars.

Yet on the ground, the impact of all this research has been very limited. Even national policies often don't reflect existing knowledge about climate change, vulnerability and adaptation – and when those policies are implemented, directly or through sub-national and local authorities, the gaps are even more evident. On the ground, knowledge and technical capacity for adaptation remain scarce in most Asian countries.

In many cases, the knowledge is simply not accessible to those who need it: materials are not disseminated to potential users, or they're not available in local languages, or they're written in very technical language that is hard for practitioners to understand. Other times, the knowledge is accessible but doesn't readily address the problems that decision-makers and planners are grappling with – often because there's been very little interaction between the producers and users of adaptation knowledge.

Many of these problems are systemic. In both Ningxia and Guizhou provinces in China, for example, we found a great deal of scientific research on climate change impacts had been done, focusing on topics that were very relevant to the provinces' specific adaptation needs – but the institutional arrangements don't necessarily ensure that this knowledge is used to support local adaptation efforts.

Knowledge-action gaps also often result from lack of coordination and collaboration among agencies: if climate expertise is concentrated in the environment ministry, e.g., but key sectors in which adaptation is needed, such as water resources or disaster risk reduction, are under the purview of other ministries.

Meeting planners' and practitioners' needs

A great deal of the information that planners and practitioners may want, however, simply does not exist yet. Across the region, we found a dire need for more downscaled projections of climate change impacts, to provide a clearer picture of the risks that individual cities, provinces or sub-national regions might face.

Some downscaling is being done; for example, a combined hydrologic and climatic model has been built for peninsular Malaysia, and development of a coastal vulnerability index is included in the Ninth Malaysian Plan; in Thailand, the Southeast Asia START Regional Center at Chulalongkorn University developed the first climate scenario for the highly vulnerable northeast region.

Yet filling these gaps requires more than modelling skills and technology: in many places, historical meteorological data are scarce, and even current-day data collection is limited. This hinders not only research, but also routine forecasting that is crucial for farmers, disaster risk managers and others.

Sector-specific information is sorely needed as well. In Cambodia, e.g., we found a need for analyses of how projected climate changes might affect farming, fishing, marine resources, forestry, water resources, infrastructure, human health and ecosystems – and what the best adaptation measures might be. Given the importance of rice in many countries' diets and livelihoods, there is a great need to understand which rice varieties might be best suited to future conditions, and how best to manage water, soil and nutrients.

Clearly, the adaptation knowledge gaps that need to be filled across Asia are about far more than climate change. Depending on the location, socio-economic conditions, and projected climate impacts, countries may also need hydrological models, flood maps, sea-level rise and storm-surge projections, assessments of biodiversity and ecosystems, agricultural data, and much more. The nature and extent of knowledge available in different countries varies considerably.

A snapshot of adaptation knowledge needs: Laos

While several Asian countries, such as China, Indonesia and the Philippines, have built a significant adaptation knowledge base at the national level, in Laos, much of the knowledge-building has occurred at the local level, through scores of small projects and missions throughout the region.

This is particularly notable in agriculture: NGOs are introducing drought- and heat- or cold-tolerant, high-protein food crops, as well as orchard and plantation crops adaptable to different climates. They have also procured new tools from Europe to expedite terracing and easily compost crop and animal wastes. Looking ahead, the hope is that this knowledge will be disseminated across Laos through the National Agriculture and Forestry Extension Service and provincial and district agricultural and forestry offices.

The analysis undertaken of Laos' adaptation knowledge needs found critical gaps in several other sectors as well. Below is a sampling:

- Knowledge of climate change impacts and adaptation in the water resources sector is strong within regional institutions, but limited at the national level. While there have been theoretical training courses, they need to be followed up with practical applications. There is also a need for more research on water resources, including tools for better flood and drought prediction.
- Better meteorological data and climate change projections are needed to inform disaster risk reduction efforts. This is particularly the case in remote areas. Research priorities include further work on weather forecasting, water level/flood forecasting, and early warning

systems, as well as risk assessments to determine the nature and dimensions of the risks posed by climate change.

- Several infrastructure projects have proceeded without adequate provisions for community resettlement and livelihood support, thus exacerbating vulnerability; officials need training on resettlement planning.
- In the transport sector, there is a lack of detailed geospatial knowledge on soil conditions concerning roadsides and steep farmlands at a high risk of landslides.
- In the public health sector, there is a need for data-gathering at hospitals about diseases such as diarrhoea, malaria and dengue, and for better communication to convey knowledge and expertise to the community level, and to raise public awareness of climate-related health and sanitation measures.



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Participatory processes are crucial to building and disseminating adaptation knowledge. Above, a discussion with civil society, local government and party cadres in Tabanan, Bali, Indonesia.

Recognizing local and traditional knowledge

Adaptation measures work best when they are tailored to local conditions and engage the people whose vulnerability they aim to reduce. Farmers may be able to provide detailed insights about their crops, pests and weeds, or rainfall patterns – as well as about existing adaptation strategies. Local customs and traditions may be great sources of resilience, or might become so if adjusted to new conditions. Existing social networks and institutions may also be well positioned to disseminate adaptation knowledge.

Thus, it is crucial to engage with communities and gather local knowledge, which is sorely underrepresented in most countries' current adaptation knowledge base. Several of our projects worked to fill these gaps through local vulnerability assessments and participatory planning exercises.

Linking research and capacity-building

A key insight from our work is that adaptation research and capacity-building are closely interlinked. Local officials and community leaders may need to learn the basics about climate change, about drivers of vulnerability, even about public engagement. Vulnerable populations may need even more support to be able to participate in these processes. As they build their capacity, however, they will be able to share more of their knowledge and experiences, effectively teaching the trainers.

The same basic principle applies to engagement with sectoral planners and experts – e.g., water resource managers. A collaborative, two-way interaction will not only build their capacity to work with climate change projections and understand their implications for sectoral plans and investments, but will also help researchers identify new lines of inquiry and learn to frame their findings in more useful, accessible ways.

As is clear from this discussion, we see knowledge as not just information, but also skills and tools. An important aspect of building knowledge for adaptation is to field-test different tools and methodologies, identify those best suited to specific needs, and train planners and practitioners to use them in their work.

Grappling with uncertainty

One of the greatest challenges in bridging research and practice is helping decision-makers deal with the inherent

uncertainty of climate change projections. Government officials generally want to act on the basis of firm, reliable knowledge, yet climate projections – especially at more local scales – can be very uncertain, with wide ranges of potential warming, rainfall changes, etc. Moreover, the projections typically go to 2050 or 2100, well beyond the time-frame of most plans or policies. In response, officials may be reluctant to act at all; thus, it is important for researchers and knowledge brokers to help them find a path forward even in the absence of certainty.

Our studies found several tools and techniques can help in this regard, such as scenario-based analyses. It is also important to reframe discussions: rather than look for certain threats for which there are certain solutions, decision-makers can look to avoid choices that exacerbate vulnerability under plausible climate change scenarios. They can also try to ensure that major infrastructure investments are robust to climate change – and rather than aim for “fail-safe” options, maybe they need strategies that make it “safe to fail”.

The role of education

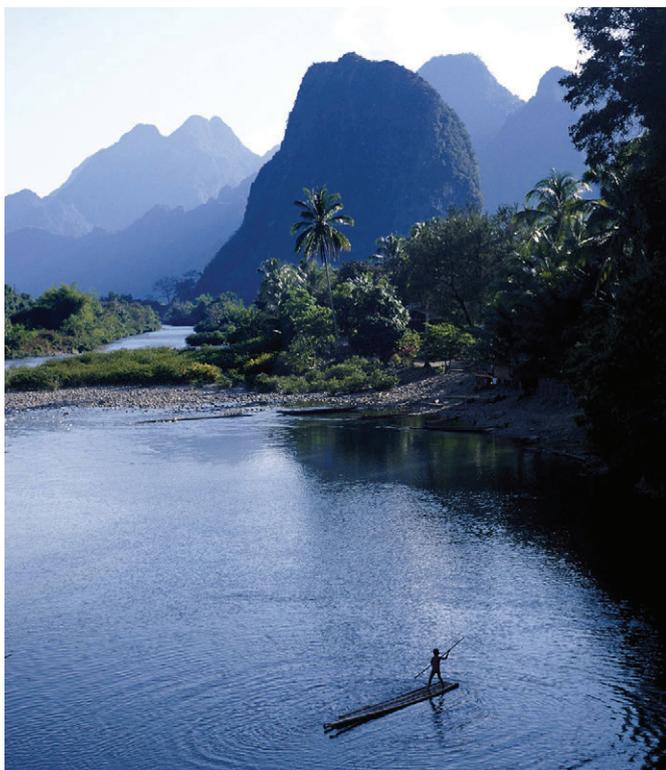
Many of the people involved in adaptation planning and practice today have essentially learned “on the job”. If they've been fortunate, they've been able to attend conferences, seminars and workshops, or been part of projects that involved significant capacity-building. But formal training has generally been limited.

There is a great unmet need for courses and hands-on learning opportunities on climate change, vulnerability assessment, and sector-specific adaptation needs and options. Climate and adaptation knowledge also needs to be integrated into the curricula of agriculture, forestry, water resources, public health and other professional and vocational training programmes.

Language remains a great barrier as well. The vast majority of published climate and adaptation research is in English, but in many countries, English-language skills are quite limited, even within national government agencies. Very little material is available in local languages – much less in simplified form, so it can be understood by ordinary citizens or ground-level practitioners. Filling these gaps should be a priority.

Policy recommendations

- Countries should make it a priority to fill adaptation knowledge gaps, not only about climate-specific issues, but also about modelling, resource planning, participatory processes, vulnerability assessments, and sector-specific needs such as meteorological data-gathering and water-saving agricultural techniques.
- Adaptation capacity-building needs to be stepped-up significantly, especially at sub-national levels. There is also a need for formal training courses and hands-on learning opportunities. Some universities are already developing relevant courses; it is also important to integrate these topics into their training curricula for key sectors such as agriculture, forestry and water resources management.
- The gap between research and practice needs to be closed. Researchers should take the lead, reaching out to policy-makers, planners and practitioners at all levels, helping them build their own capacity, and working to understand and address their needs. These interactions should be viewed as a true collaboration, with learning in both directions.
- Recognizing the importance of local knowledge and traditions, researchers and adaptation planners need to engage local communities, including vulnerable groups, learn from their perspectives and experiences, and identify existing sources of resilience that they can build on.
- A multi-faceted approach can help break language barriers. Key actors who need to access materials available only in English should be offered additional instruction. At the same time, efforts should be made to translate vital knowledge into local languages. A second, crucial layer of “translation” is to produce educational materials that explain concepts in simplified form, so laypeople can understand them.
- Given the extent of the adaptation knowledge gaps across Asia, sharing information and best practices will be vitally important, especially for smaller and less-developed countries. While adaptation measures need to be tailored to local conditions, there are plenty of similarly situated regions and communities – and strategies for rice cultivation, e.g., may be widely applicable.



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Laos needs to build knowledge on several fronts to support adaptation – including how climate change will affect ecosystems. Above, a boy on a bamboo raft in Vang Vieng.

This policy brief was written by Marion Davis and Skye Turner Walker, based on several country-specific scoping studies and a regional assessment published through the Regional Climate Change Adaptation Knowledge Platform for Asia (AKP), all available at www.asiapacificadapt.net or weADAPT.org.

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