ACTIONS ON URBAN CLIMATE CHANGE RESILIENCE

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Thailand Environmental Institute
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December 2013

Published by:
Institute for Social and Environmental Transition-International
Boulder, CO USA

For a downloadable PDF of this publication, please visit:
www.i-s-e-t.org/publications

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ACKNOWLEDGEMENTS

The preparation of this report was a collaborative effort that relied upon the contributions of a number of individuals. This report was written and prepared by Justin Henceroth, Richard Friend, Sarah Reed, Suparerk Janprasart, Pakamas Thinphanga, Jim Jarvie, Ratri Sutarto, Phong Tran, Tuyen Nghiem, Huy Nguyen, and Dilip Singh.

Purnomo Dwi Sasongko, Anniessa Delima Sari, Erwin Nugraha, Gautam Gupta, S.S. Verma, Wannobon Khuan-Arch, Suwannapa Homchuen, Waraporn Burirak, Parisud Seethongdee, Krongjit Kitikard, Nguyen Anh Tho, Ngo Thanh, and Ngo Thi Le Mai all contributed as part of the research team.

The report was copy edited by Abrina Williams and Lea Sabbag, designed by Michelle Fox, and produced by Pimolwan Singhawong.

This report was made possible by the generous support of The Rockefeller Foundation as part of the Asian Cities Climate Change Resilience Network (ACCCRN).

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EXECUTIVE SUMMARY

Urbanization and climate change represent fundamental transformation. Climate change means that climate conditions, including natural hazards, are increasingly uncertain and unpredictable, while urban growth, especially in many parts of the developing world, means that more people are living in these vulnerable cities, facing new hazards and risks. Against this backdrop, building the resilience of urban areas is gaining currency as a way of dealing with future uncertainties and risks of climate change.

The Asian Cities Climate Change Resilience Network (ACCCRN) was one of the first major programs worldwide to work directly at the city level to apply knowledge of resilience to urban and climate change issues. Funded by the Rockefeller Foundation, ACCCRN brought together a range of national and international organizations across India, Indonesia, Thailand, and Vietnam to develop, apply, and refine tools and techniques for building urban climate change resilience (UCCR). As an experimental program, ACCCRN included mechanisms for learning and critical reflection among network members and city partners. In each city, stakeholders worked with ACCCRN country coordinator organizations and regional partners to carry out an iterative process of building resilience that included conducting vulnerability assessments, developing resilience strategies, and implementing intervention projects. These intervention projects, in particular, accounted for a large proportion of the time, energy, and resources in ACCCRN. This report draws on experience implementing projects across ACCCRN in order to better understand the role of projects within resilience processes as well as the characteristics of projects that enabled them to build resilience.

There has been and still is significant interest and academic debate on the nature and characteristics of resilience. Resilience theory embraces the complex nature of social-ecological systems and emphasizes the ability to deal with change and uncertainty using a range of tools and techniques that enable continued function, growth, and development. By applying these concepts of resilience to urban and climate change contexts, ACCCRN has facilitated a convergent understanding and practice of resilience. This convergent practice is in line with much of the academic literature, but highlights key areas of interest and focus. Practical experience in ACCCRN indicates that UCCR requires long-term, iterative, and facilitated processes that bring together different knowledge and interests and allow stakeholders to work from identifying vulnerabilities to implementing actions. These processes create space to analyze, understand, and work in ways that address integrated systems dynamics and promote systems-oriented approaches by developing new networks and promoting collaboration amongst a diverse set of stakeholders. At its core, UCCR focuses on building the capacity to learn and reorganize. Projects present an opportunity for stakeholders to experiment; crises and disasters become opportunities to critically reflect on experience; and recovery and rebuilding can allow cities to shift development in more favorable and resilient directions.

Individual intervention projects, thirty-eight of which were conducted within ACCCRN, have played an important role in UCCR processes. In many cities, projects served as entry points for resilience programming. Providing support for projects made the ACCCRN process and ACCCRN partners more credible, ensuring that the program would do more than just support 'talking' in the city. The tangible benefits that projects were

expected to deliver were key incentives for engaging many stakeholders. Projects supported under ACCCRN also enabled stakeholders to undertake new kinds of activities and styles of working with less risk than if undertaken by programs funded through government mechanisms. In many cases, these kinds of projects have promoted incremental changes that over time can lead to more large-scale reform. Finally, as projects ensure continued engagement at the city level, they are a conduit for ongoing facilitation of resilience building processes in a city.

Within ACCCRN, a diverse portfolio of intervention projects was funded to represent a range of options for what resilience actions might look like. These include flood modeling, mangrove restoration, building storm-resistant housing, and ecosystem restoration, among others. Notably, none of these projects stand out on their own as 'resilience' projects—all projects could have been conducted under many different urban, environmental, or development programs. However, within ACCCRN, these projects incorporated specific project and process design elements that, in addition to the specific benefits they provided, contributed to overall UCCR. Based on experience conducting projects in ACCCRN, there are core elements of projects that ensure they contribute to resilience.

These core elements ensure that projects achieve their stated goals, while contributing to the resilience of the city more generally. Explicitly incorporating these elements into project and process design can help donors, cities, governments, and NGOs design better and more effective approaches to building resilience.

Core Elements of Resilience Projects

Tangible improvements

Activities directly and measurably impact and improve peoples' lives

Capacity to learn and reorganize

Projects build capacity for stakeholders and citizens to learn and reorganize based on new evidence, experience, and information

Future-oriented approaches that consider complexity and uncertainty

Incorporation of elements that recognize and accommodate the uncertainty and unpredictability associated with urbanization and climate change

Collaboration and network building

Diverse groups of people across different sectors and organizations convene and work together to analyze issues and solve problems

Citizen access to information

Development of mechanisms to generate, share, and expand citizen access to and ownership of information

Effective citizen engagement

Citizens are actively engaging in analyzing, making decisions about, and implementing projects

Distinct understanding of urbanization and resilience

Projects reflect and address a distinct understanding of the challenges and opportunities that urbanization presents

INTRODUCTION

At the start of the twenty-first century, cities around the world are facing numerous challenges. They are growing rapidly—since 2010 the majority of people have lived in cities and by 2050 more than 70% will call urban areas home, even while absolute numbers increase. With much of this expansion of urban area occurring in the coasts, deltas and river basins that are already hazardous, globally, but particularly in the developing world, these rapidly growing cities are also prone to some of the most severe impacts of climate change, such as more frequent, extreme, and unpredictable climate events. As the most populous region in the world, Asia has numerous cities that are particularly vulnerable. Against this backdrop of change and uncertainty, resilience, specifically urban climate change resilience (UCCR), has emerged as a new perspective for helping cities deal with change.

Over the past few decades, academic research on complex social-ecological systems has developed an understanding of resilience as being founded on the ability of systems to absorb disturbance, recover from shocks, and continue to develop in the face of turbulent change (Folke, 2006; Holling, 1973; Walker, Holling, Carpenter, & Kinzig, 2004). Resilience thinking embraces complexity, change and uncertainty, thereby providing a critique of conventional approaches to management that focus on certainty, a predict-and-act approach, and component-by-component management. It advocates cultivating forms of adaptive management for complex systems to be able to deal with changing circumstances and uncertainty of the future (Folke, Hahn, Olsson, & Norberg, 2005).

The concept of resilience has come to take a central place in global debates on climate change, disaster risk reduction, and development. It is seen as offering a new way of approaching inevitable change, shocks, and crises in a turbulent and increasingly unpredictable world. With growing attention on cities and urbanization, resilience is now being taken on by a variety of organizations and entities that have traditionally worked in climate change adaptation. Along with this growing interest, challenges remain in understanding how UCCR can be achieved in practice.

This report attempts to provide some answers to this core question by drawing on practical experience in a large, innovative program, The Asian Cities Climate Change Resilience Network (ACCCRN). Supported by the Rockefeller Foundation, ACCCRN is a multi-year regional program in Asia that was designed to develop, test, and implement tools for building UCCR. ACCCRN was one of the first initiatives aimed specifically at addressing the nexus of urbanization, climate change, and resilience. ACCCRN recognized that UCCR was different than other climate change response theories, such as mitigation and adaptation. However, within ACCCRN, the understanding of UCCR has not been static; it has been translated and interpreted differently between partners, countries, and cities such that even within single organizations or in the minds of individuals, the concept of UCCR has evolved. As UCCR has been tested and implemented throughout the program, a convergent understanding and practice has begun to develop among cities, partners, and donors.

ACCCRN targeted ten medium-sized cities in four countries in Asia that are particularly vulnerable to climate change: India, Indonesia, Thailand, and Vietnam. Each city engaged in an iterative, multi-stage process to assess vulnerability in the context of urbanization and climate change, develop strategies for building resilience, and undertake intervention projects to build resilience. These intervention projects function as the 'implementation' element of the resilience building process and have been the focus of significant amounts of effort and resources. It is through these projects that city leaders and stakeholders are able to consolidate efforts at building capacity and addressing the core issues influencing their vulnerability.

When developing implementation activities under ACCCRN, there was also an explicit interest in selecting a diverse suite of projects that collectively demonstrate the many ways in which resilience can be built—information that could help guide replication in other parts of the world. Throughout ACCCRN, thirty-eight projects have been funded and have been or are being implemented. Activities supported under ACCCRN projects include mangrove reforestation, loans to support storm resistant housing, rainwater harvesting, early warning systems, establishment of information centers for climate change, river basin management and hydrological modeling studies, among many others. The activities undertaken through these projects are important in their own right and have been described previously in a number of publications ("ACCCRN City Projects," 2013). However, when seen simply as projects and activities, almost all of these interventions could have easily have been part of other types of programs (i.e. programs not specifically targeting resilience). Yet within the context of ACCCRN, each has been part of a broader process that has helped shaped them as resilience-focused interventions.

This report considers what it is that is special about these projects as resilience building interventions. Understanding the role of projects in processes to build UCCR and how those projects contribute to resilience is critical for cities, organizations, and donors interested in further work in this field. This report, which is based on feedback from organizations implementing ACCCRN and city leaders, reviews the projects that took place in ACCCRN in order to better understand projects within the context of resilience building process. We conclude that it is this larger process—and the central emphasis placed on promoting social learning and adaptive processes—that distinguishes projects as resilience building initiatives.

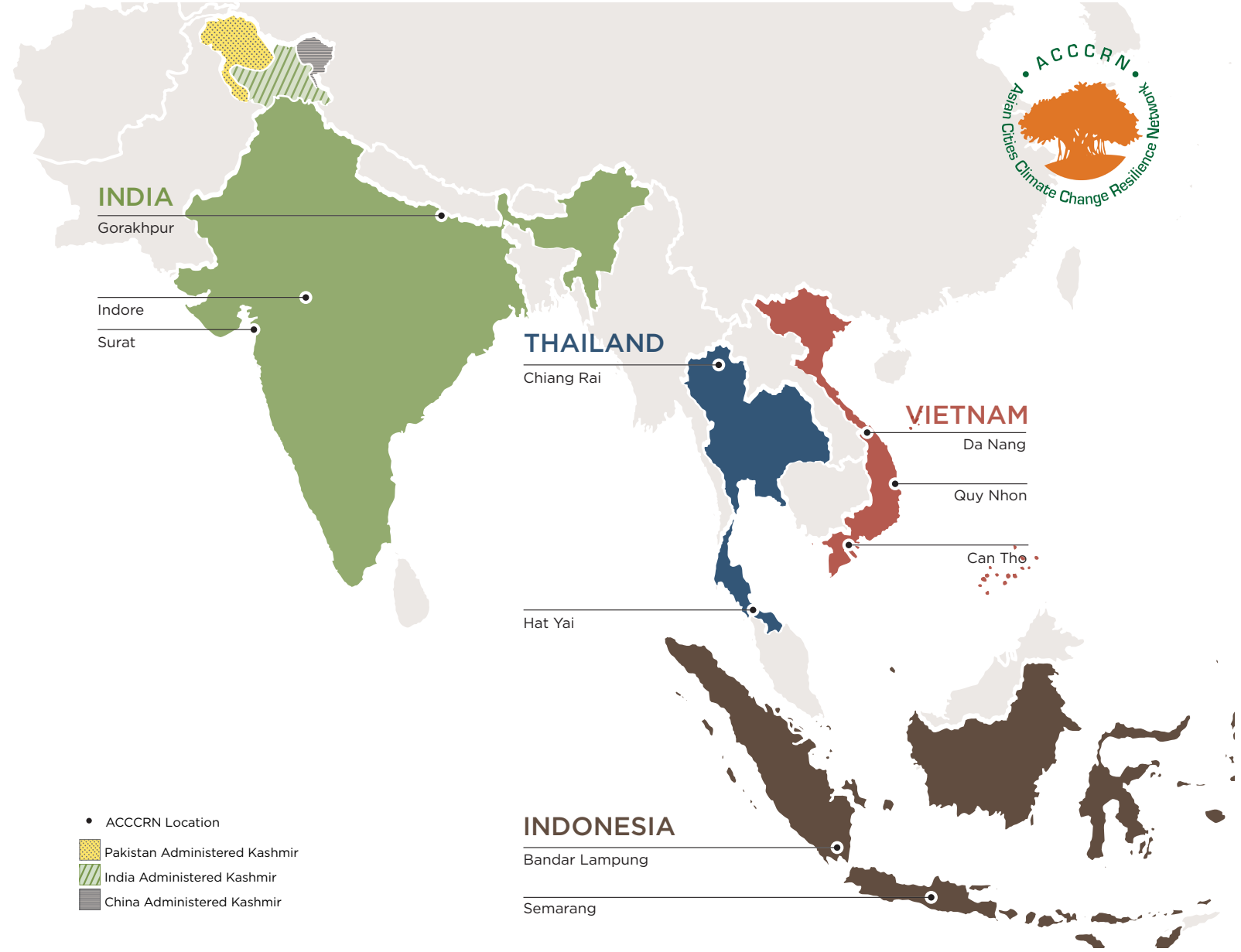
ACCCRN Partners

Rockefeller Foundation engaged a number of partners at the country and regional level to support ACCCRN.

- Institute for Social and Environmental Transition-International (ISET-International)
- Thailand Environment Institute (TEI)
- Vietnam National Institute for Science and Technology Policy and Strategy Studies (NISTPASS)
- Verulam
- APCO Worldwide
- Arup International Development
- International Council for Local Environmental Initiatives (ICLEI)
- International Institute for Environment and Development (IIED)
- International Center for Climate Change and Development (ICCCAD)
- Asian Disaster Preparedness Center (ADPC)
- MercyCorps
- TARU Leading Edge
- Gorakhpur Environmental Action Group (GEAG)
- The Energy and Resources Institute (TERI)

FIGURE 1

Asian Cities Climate Change Resilience Network



Introduction to The Asian Cities Climate Change Resilience Network

Initiated in 2008, ACCCRN is a nine-year, $59 million initiative to build UCCR in 10 cities in Vietnam, India, Thailand, and Indonesia. ACCCRN was designed to "demonstrate a diverse range of effective approaches, processes, and practices for assessing and addressing urban climate vulnerabilities, and through this base of practice and knowledge to catalyze attention, funding, and additional actions for building UCCR in more places" ("Asian Cities Climate Change Resilience Network Program Brochure," 2008).

ACCCRN engaged both in-country and regional partner organizations. In-country partners interacted directly with the cities within their country and managed national components of ACCCRN. Regional partners were engaged to provide capacity building, research, technical assistance, and other support to in-country partners and cities.

ACCCRN was organized into four phases:

Phase 1: City Scoping
A number of cities throughout the four target countries were reviewed to assess their vulnerability to climate change, city-level risks, and the possibility for engaging governments and stakeholders in a resilience process. This scoping ultimately led to the selection of the 10 medium-sized cities that are the core of ACCCRN.

Phase 2: City Level Engagement
City partners engaged in a shared learning process, which included multiple dialogues between diverse sets of stakeholders; conducting a vulnerability assessment to identify vulnerable systems, groups, and areas; and engaging communities and enhancing knowledge about priority issues through pilot projects. This phase culminated in the development of city resilience strategies to generate and prioritize actions for building UCCR.

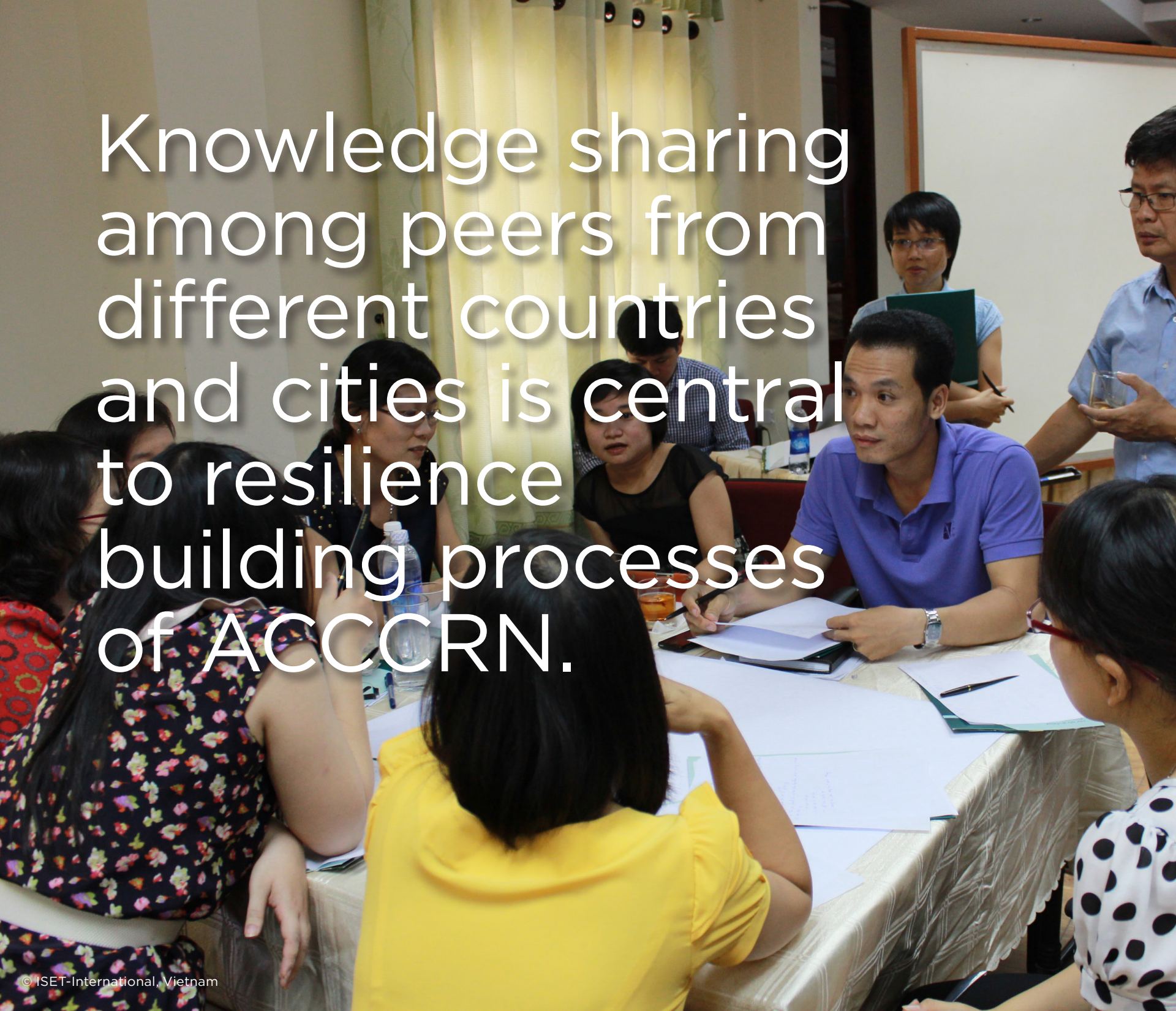
Phase 3: Implementation
In this phase, ACCCRN is supporting intervention projects. These were defined as "a specific proposed activity or set of activities in the city that will contribute to building urban resilience to climate change. An intervention refers to a specific project or piece of planned work or activity with clearly stated objectives to be completed over a finite period of time" ("ACCCRN Interventions, Proposals, and Funding Criteria Guidelines," 2010).

Phase 4: Scaling Up, Replication, and Networking
This phase is operational concurrently with Phase 3, wherein many more partners have been engaged to consolidate and scale up learning and experience from the ACCCRN program.
This multi-phase process was designed to lead cities from an early stage where they could better

understand how and why they were vulnerable, through a deliberate planning process to develop strategies, to the final phase that focused on implementing specific activities to build climate resilience. The third phase—with a focus on implementing intervention projects—is the core focus of this report.

Projects were developed by city stakeholders in consultation with national-level coordinators, and were primarily derived from resilience strategies. Project ideas were approved based on an outlined set of criteria, including:

- Contribution to building UCCR;
- Impact on the lives of poor and vulnerable populations;
- Potential to integrate with other resilience building measures at the city level;
- Scales of impact;
- Technically and operationally viable;
- Financially viable and sustainable;
- Prospects for timely implementation;
- Local ownership;
- Ability to leverage other resources (financial, human, technical);
- Prospects for replication in other places;
- Ability to achieve scale;
- Ability to contribute new UCCR knowledge and practice;
- Innovative; and
- Contribution to a diverse and balanced set of projects and interventions ACCCRN-wide.



REPORT METHODOLOGY

This report is a result of a participatory research process to facilitate learning with program stakeholders that took place within ACCCRN. Regional partners and country coordinators from each ACCCRN country conducted and developed a set of semi-structured interview questions. ACCCRN partners first considered these questions with staff inside their own organizations and subsequently conducted focus group discussions and semi-structured interviews with city partners. Questions were adapted to each context and language, but, in general, sought to elicit discussion and critical reflection on:

- What were the most significant changes as a result of ACCCRN?
- How is ACCCRN different from other types of projects you have worked on?
- What does UCCR mean to you, and how would you build resilience in your city?

These conversations often included follow-up questions, informal discussion, and debate. They were intended to stimulate critical reflection and learning, rather than to elicit specific and narrowly defined answers.

There are several factors that contributed to this approach. Fundamentally, ISET-International, ACCCRN, and ACCCRN partners have approached learning, including among peers from different countries and cities, as being central to the resilience building process of ACCCRN. This more qualitative review of one of the largest phases of the ACCCRN program (project implementation) was designed as a participatory open-ended process to provide space for the learning that has been occurring within the program. This methodology recognized that each of the researchers and implementing organizations was coming from a different perspective. We realized that translation (literal and figurative) across cultures can result in misunderstandings and differing interpretations. It is not enough to simply ask the same questions in different places. Discussion and deliberation sought to elicit critical reflection among partners in order to reach a common understanding of key concepts.

ACCCRN partners later met together as a larger group in Bangkok to share insights. Over several days, an active, facilitated discussion provided an opportunity to identify commonalities and differences in peoples' responses. By the end of the workshop, partners agreed to a set of key messages along with more contextualized analysis of country specific learning, that are now presented in this report. Some of these have evolved further through the collaborative writing, personal reflections, and sharing among partners that has created this report.

AN IMPROVED UNDERSTANDING OF URBAN CLIMATE CHANGE RESILIENCE

ACCCRN and ACCCRN partners have been at the forefront of testing and defining resilience in an urban climate change context. However, while UCCR is an emerging field over the last five years, the concept of 'resilience' has a long intellectual history. The conceptual underpinnings of resilience were developed through academic research in many disciplines over several decades—including from social-ecological systems, engineering, and psychology. Resilience is defined in many ways, including as "the capacity of a system absorb disturbance and reorganize while undergoing change so as to still retain essentially the same function, structure and feedbacks, and therefore identity" (Walker et al., 2004), "the ability to anticipate risk, limit impact, and bounce back rapidly through survival, adaptability, evolution, and growth in the face of turbulent change" ("Definitions of Community Resilience: An Analysis," 2013), and "the capacity to deal with change and continue to develop" ("What is Resilience," 2011). While these and other definitions differ in their specifics, they all share a focus on the ability to deal with change and uncertainty using a range of tools and techniques that enable continued function, growth, and development.

Resilience thinking has been highlighted as an important insight for climate change adaptation because it emphasizes flexibility under conditions of uncertainty and volatility, rather than slow and predictable change that can be precisely foreseen (Berkes, 2007). Likewise, researchers have applied resilience thinking as a framework for city development and planning (Ernstson et al., 2010). This highlights the complexity of cities, where provisions and services rely on systems, agents, and institutions operating at multiple scales, and where sudden shocks can have far-reaching and catastrophic impacts, and where, from the perspective of political economy, urbanization is seen as a social and economic transformation in fiercely contested cities (Harvey, 2012).

ACCCRN takes an approach to building urban resilience that is facilitated through processes that engage actors to determine the nature, functions, and vulnerabilities of urban systems. This is founded on a process of shared learning dialogue (SLD) that recognizes the different values and knowledge of different urban actors, and the importance of creating space for dialogue. Through these processes, stakeholders have an opportunity to engage in a defined strategic planning and decision-making process that considers the direction of their city in the future, which can then lead toward decisions and determinations about how to best become more resilient. From city to city, the path to resilience is different—some cities and actors may focus on maintaining and sustaining current conditions, adapting to new or changing conditions, or making fundamental changes that help the city be better prepared for key vulnerabilities (Folke et al., 2010; Walker et al., 2004). In many cities in ACCCRN, this process has been led by groups of actors, neighborhoods, and communities rather than the city as a whole. Indeed, within ACCCRN this process has often targeted the core governance and administrative gaps that rapidly growing cities in Asia face.

Understanding and Translating Urban Climate Change Resilience

Debates about resilience concepts are active in academic circles. Meanwhile, resilience has gained considerable currency within the international development community without

a clear consensus on its definition (Bahadur, Ibrahim, & Tanner, 2010). Friend and Moench (2013) highlight that in the international development field, there are two distinct challenges to the uptake of resilience, based on a common confusion between resilience as a term and resilience as a concept.

The first relates to linguistic translation. The word 'resilience' does not exist in many languages and the concept is not easily translated. When the everyday English language term is translated, it is often substituted by other words such as 'capacity to stand firm' in Vietnamese or 'security' in Bahasa. These have quite different connotations from the concepts associated with resilience and adaptive governance described above.

The second problem arises when there are attempts to translate the concept of resilience, and not just the term. Though a technical, academic concept, the word resilience resonates with many stakeholders because of its common English connotation: 'the ability to bounce back.' Because of this, resilience has become a rallying cry for preparing for natural hazards and other shocks and a familiar term that stimulates a rich variety of concepts and ideas. However, translating only this simpler concept does not convey the complexity or fullness of resilience theory.

These challenges with translation, and the connotations in local languages that such translations lead to, raises concerns that resilience is being adopted as another develop 'buzzword, divorced from its technical meaning. Resilience, in this way, can be used in reference to many unrelated types of processes. In some cases, it has been used ironically with the very types of top-down, rigid approaches to management that resilience thinking critiques (Garschagen, 2011). In the case of resilience, this is particularly worrying because the common connotation of 'bouncing back' is out of touch with a need for more underlying transformation of current systems to make them more adaptive and socially equitable. Focusing on the ability to bounce back can suggest that those with nothing to lose and who are more familiar with shocks and crises can most easily recover. This can lead to assumptions that the poor are more resilient than the rich simply because they have less to lose and, are therefore, less deserving of resilience building support (Davoudi et al., 2012; Friend & Moench, 2013). The emphasis on systems—with often inadequate consideration of whose systems and for whose benefit they operate—can allow resilience to be used to support perverse arguments around the greater good of the system. This suggests a need to understand both the ways in which the term 'resilience' has been literally translated and the ways in which it is interpreted and applied.

Resilience in ACCCRN

At its inception, ACCCRN did not prescribe a specific definition or conceptual framework for resilience across the program. This allowed partners at all levels to consider how 'resilience' differed conceptually from other climate change concepts, such as mitigation and adaptation, and the significance of UCCR's urban focus beyond simply working in cities. Across ACCCRN, partners adopted the concept of UCCR based on their own experiences, values, and interests.

As ACCCRN progressed, facilitated processes[1] to connect partners throughout the network promoted learning, discussion, and engagement to better understand UCCR and how it was being applied in different contexts. In ACCCRN, as in the academic literature, resilience can be and has been interpreted in multiple ways. However, across the ACCCRN program, a convergent practice of UCCR is now emerging among core partners. This new understanding of UCCR aligns quite strongly with technical definitions presented in resilience and adaptive management literature, but also emphasizes concepts of increasing access to information, building coalitions, engaging people with diverse and potentially opposing political views, and promoting spaces for public deliberation.

Many ACCCRN partners viewed resilience from the perspective of their own sectors. This allowed organizations to integrate

1 There were multiple processes that occurred in ACCCRN to support learning and engagement by ACCCRN partners, including an effort focused on lessons and learning led by ISET-International, a knowledge management process led by ARUP, and a process to promote local research led by IIED.

Defining a City

ACCCRN's focus on urban areas has highlighted challenges defining and translating the idea of city. A city may be defined as an administrative unit covering a specific geographic area, however, that area may include areas of non-urbanized land or only a fraction of the urban area. By contrast, if a city is understood as the whole urbanized area, that area may cross multiple administrative districts and may not be easily defined. Moreover, cities bring together many diverse, and sometimes conflicting, interests and values, knowledge, and power of those who live in a city or participate in its economy. From this perspective, there is no easy way to define a single city system. Because resilience approaches emphasize the need to work with whole systems, ACCCRN sought to expand focus to the extent of the urban area—a challenge that was exacerbated because many ACCCRN cities are changing rapidly.

Indeed, the word 'city', when translated into other languages, may not effectively convey this more complex understanding of city. For example, in Thai, the word for city, *mueang*, has many meanings. It refers to the administrative district that houses the provincial seat of government and administration, and that generally includes the main provincial urban center. However, *meuang* can also be used to refer to the country (*meuang Thai*), and is historically used to distinguish between areas of state control and the wilderness of nature. There is no commonly understood word for urbanization, and academic terms that have been proposed can be understood as either the process of developing a new administrative unit or the process of city growth.

Because of these challenges, many ACCCRN processes had to work to define what was indicated by the word city—what did it mean in terms of geographic area, who lived and worked in that area, and what entity or entities were responsible for managing that area. This often required working with city partners to develop an understanding of the urbanized area as an integrated, yet, changing and contested system, and then starting processes to work with that area.[1]

1 The Mekong-Building Climate Resilience in Asian Cities (M-BRACE) program, which is working in Thailand and Vietnam and was developed out of ACCCRN, has focused particularly on developing an understanding of 'city' that is defined not by administrative boundaries or areas, but rather by the extent of an inter-connected urban community.

climate change into their own work and build on existing strengths. Partners were able to identify the aspects of resilience to which they were best able to contribute, and as a result ACCCRN was able to mobilize a diverse range of stakeholders. Several partners emphasized that resilience made them think more carefully about complexity and linkages between different parts of systems, or that it shifted their thinking from discrete hazards to a holistic, no-regrets approach.

Having such different understandings of resilience can lead to opportunities as well as challenges. On the one hand, if people are able to understand resilience within the context of their own work, they are more likely to strongly engage in the process. However, if these distinct understandings of the concept differ too much, it could undermine a more comprehensive or holistic approach to building resilience.

In some cases, however, resilience was used to describe the kinds of top-down planning processes that counteract the technical definition and might undermine poor marginalized stakeholders. For example, a project in Da Nang to help households build storm resistant housing was very valuable in helping cities deal more effectively with repeated flood disasters, but was not able to address the larger-scale or more complex ecological and social challenges of resilience. New homes offered better quality of life for people, but because they were built in the same exposed locations as previous homes, they did not address underlying sources of vulnerability—some suggested that high rise settlements in less exposed areas of the city may have actually contributed more to overall resilience. These varying interpretations raise concerns that terminology when not carefully transmitted can become associated with approaches that avoid deep-rooted problems, and could actually undermine resilience.

Challenges Applying Resilience

Many of these new understandings of resilience rely on the assumption that equitable and fair consensus building processes can be implemented in cities. However, many problems cannot be resolved through the types of consensus building process emphasized in resilience literature, especially in contexts where rapid urbanization is changing the governance landscape or where governments are hesitant to empower or engage citizens and stakeholders.

Resilience thinking is a field that emphasizes processes of learning, deliberation, and consensus building to foster systems-level changes. It assumes that systems can be identified, better understood, and acted upon. Many critics have questioned this assumption. They note that different stakeholders define and experience systems differently depending on their interests and values (Leach et al., 2007; Osbahr & Boyd, 2007). This is especially the case in cities, where decisions around land-use, rights, and citizenship often reflect very unequal divisions of power. For example, farmers whose land is appropriated review urban development in a different way from investors and developers. The technical language of systems and resilience thinking can obscure the political nature of these debates (Evans, 2011). There is even a possibility for the application of resilience processes framed around the greater good of the system, to (unwittingly) support powerful interests at the expense of supporting the needs of less powerful people.

In ACCCRN, when this issue was encountered, some partners shifted focus from building consensus and understanding risks collectively, to engaging in politics or advocacy. Early stages of the ACCCRN process focused on problem framing, by raising awareness of climate change and building shared understanding of the problems—in a sense, consensus building. Yet, while problem framing led to some shared solutions, in other cases it highlighted deeper political rifts. In Quy Nhon, greater understanding of the risks led to efforts by city partners to build a coalition and conduct research, intended to sway master plans. By doing so, the partners found that they were engaging in a very political arena. Meanwhile, in Gorkahpur, the approach adopted by GEAG has been framed as ‘people-centered resilience’ encouraging people to push for greater accountability and transparency from the state. When new urban development was proposed in the city’s

Ramgarh Lake, it greatly threatened key infrastructure and ecosystem services in many locations, triggering a citizen's group to coalesce and campaign against the development. As such, citizens at neighborhood level gained greater capacity to engage with and successfully lobby the city government to get roads and drains constructed in the ward and to monitor delivery of states services and infrastructure to their ward.

Influencing ACCCRN Partners' Own Work in Resilience

These ideas about UCCR are already influencing additional work with ACCCRN partner organizations such as Mercy Corps, ISET-International, TEI, and GEAG. Mercy Corps is reframing some of its programs in resilience terms. It is developing global regional resilience hubs and framing a working definition for resilience as the capacity of complex social-ecological systems to cope, adapt, and transform in the face of shocks and stresses. It recognizes Mercy Corps' resilience-specific role is to ensure that the communities they engage with are part of this process in any context and around the world. Additionally, ISET-International is managing and TEI is helping implement a new grant from USAID that aims to build resilience in four cities in Thailand and Vietnam by focusing on urban processes and addressing governance challenges, such as the need for public deliberation and citizen information. In addition, ACCCRN and the associated Mekong–Building Resilience in Asian Cities program have expanded into twenty-five additional cities.

The experience of partners and cities in trying to better understand and apply resilience concepts provides an opportunity to help other organizations that are interested in issues of resilience. As the lessons and learning from ACCCRN are documented, they should provide guidance for a wide range of actors, including local cities, national governments, organizations, and donors.

"Intriguingly we most commonly meet framings in which system resilience comes along with the necessary costs to be borne by the poorer groups (we see similar arguments around economic efficiency and austerity and also sustainability). Yet it is less common to see arguments around city system resilience and the need for costs to be borne by the wealthy and powerful in the interests of the greater good. That resilience discourse is framed in ways that, at minimum, do not inherently draw attention to issues of equity or, at maximum, are open to manipulation by established interests is an area that requires greater critical scrutiny."

—Friend & Moench, 2013

The Meaning of Resilience

Across ACCCRN, there has not been a shared definition of resilience. Definitions of resilience emerged within countries or between cities based on factors including: how 'resilience' was translated into national languages and then interpreted; prior experience or organizational history of implementing partners; needs and priorities of city governments; and interpretation of donor opportunity. As part of the research undertaken for this report, local partners and country coordinators were asked to share how they understood the concept of resilience. The concept of resilience was new to most partners when the program began. The Rockefeller Foundation, and their facilitating partner ISET-International, provided guidance to 'urban climate change resilience' through various channels, including the climate resilience framework introduced in 2010 (Tyler & Moench, 2012). Our interviews with partners found that there was a rich set of translations and interpretations of resilience across the program.

In Indonesia, the term 'resilience' is generally translated as *ketahanan* meaning 'security' in Bahasa; in Vietnam, they use the expression *khả năng chống chịu* (capacity to stand firm) or thích ung (adapt); and in Thailand, it is translated as *kan rap mue*, which translates as 'coping with an unavoidable shock or event.' In most cases, partners strongly associate the term with climate change specifically, a result of ACCCRN's emphasis. Though the technical concept of resilience is holistic in nature, the climate emphasis of ACCCRN led most partners to associate resilience exclusively with responding to climate change.

Yet, difficulty in translating the word is different from translating the concept of resilience. A number of partners said that introducing resilience improved their technical understanding of complexity and the complex nature of the problems they faced. GEAG, in Gorakhpur, shared that they developed a greater understanding of complexities, linkages and inter-dependencies in urban systems. This, in turn, sharpened their perception of rural resilience. They view resilience as polycentric, exhibiting characteristics of robustness or flexibility. As an organization driven by concerns for social justice, equity and poverty reduction, GEAG adopted a 'people-centered resilience.' In Vietnam, country partners supplemented the terminology of 'adapt' by referencing resilience characteristics such as flexibility, modularity, ability to learn, etc. in order to expand local partners' understanding of the concept beyond the term.

Responses from a number of partners indicated that their understanding of climate change adaptation has changed from a focus on reducing exposure to reducing impacts—and on predicting events to cultivating 'no-regrets strategies.' The leader of the Climate Change Coordination Office in Can Tho City noted that in the past he thought that because designated government departments were responsible for protecting communities from flooding through infrastructure, it was critical to develop a good database and have good future projections in order to facilitate actions to predict and prevent damage. He has now shifted towards seeing the purpose of building resilience as being to reduce impact, rather than reduce exposure, by helping the community,

people, and different sectors to reduce their risks in the future. He now argues that building resilience is the responsibility of every individual, community and sector.

For others, resilience did not present such a large distinction from other kinds of work. Partners in Semarang, Indonesia noted "there have been activities building resilience [in the past] but using another word or program title."

There are also evident divergences between partners about what a resilient city would look like. Partners often associate the term most strongly with the sectors and strategies that they encounter in their daily work. Da Nang City is a case-in-point. When asked what a resilient Da Nang would look like, leaders of the Women's Union (whose mission is to work with poor and vulnerable households) and leaders of the Department of Education both argued that household and community-level awareness and preparedness were the most urgent and critical aspects of resilience. Leaders from the Department of Natural Resources and Department of Construction, in contrast, emphasized the need for better information and better planning from the part of the state

Personal and organizational values strongly shaped the ways in which different partners framed the problem of building resilience. In Gorakhpur, country partner GEAG's view of resilience as a 'people-centric' concept has focused efforts on developing strategies related to people and their behavior. From this perspective, people need to be empowered and aware enough to make demands of the state and participate in or even initiate specific resilience building activities for the city.

Others take a much more technocratic, physical systems view. In Da Nang, one leader from the Climate Change Coordination Office argued that households in vulnerable areas should be resettled to high-rise buildings in safer locations, rather than supported to build storm-resistant homes in their current locations. With sensitivities around land use, the city's expansion into flood prone areas that can transfer flood risk to traditional villages is not a comfortable topic of discussion for most partners.

Partners from the Department of Planning and Investment and Climate Change Coordination Office in Quy Nhon provided an interesting contrast. For them, resilience prompts a reconsideration of the city's current development trajectory. They expressed that city development over the past decade has helped build resilience in a number of ways, especially in providing important social infrastructure (e.g., schools, hospitals) and systems and resources for responding to disasters. But, they note equally that the city's expansion, including land use changes and updated flood protection measures, has also had serious social costs, such as the loss of livelihoods for farmers and coastal fishermen who were formerly self-sufficient and the transfer of flood risk from high investment urban areas to lower income and rural communities.

CONVERGENT PRACTICE OF RESILIENCE

Despite the different interpretations and actions taken in ACCCRN, across the program, a convergent understanding of resilience has developed. This understanding fits with technical and academic approaches to resilience while also starting to outline a new, practical, and implementable understanding of resilience and UCCR that can be taken up by donors, governments, and other country partners.

Resilience approaches need to seek to understand the dynamics of whole systems by combining knowledge from different sectors and perspectives rather than focusing on detailed knowledge of individual parts. In each of the ACCCRN cities, partners greatly increased their capacity to think at a systems level by, for example, addressing the dynamics of flood regimes across the watershed or recognizing that the city as a system extends beyond a single administrative unit and includes the extent of the urbanized area.

Addressing systems dynamics depends on networks that transcend formal divisions, such as sector, identity groups, and levels of authority. These networks often include both formal (such as through steering committees) and informal networks. In growing cities where the urban area is not bound within the municipal boundaries of 'the city,' these networks must expand to include stakeholders from other administrative areas. ACCCRN helped form new stakeholder networks in every city it worked in, which has helped build trust so that stakeholders are able to share information and work together in unprecedented ways. These networks, which convene a diverse group of stakeholders, support collaboration and dialogue around city issues. As these networks become established, they also provide opportunities to share management and decision-making.

At the core of this emerging understanding of UCCR is a focus on the importance of the ability to learn and a capacity to engage and collaborate across a city. Contributing towards these elements of resilience requires effective processes and support. Indeed, when reflecting on ACCCRN, partners often emphasized the dialogues, networking, knowledge production, and sharing that occurred throughout the program were some of the most significant outcomes.

TABLE 1

MOVING FROM CITY CLIMATE ADAPTATION TO URBAN CLIMATE CHANGE RESILIENCE

Urban climate change resilience (UCCR) differs from climate adaptation in a number of key ways.

City Climate Adaptation
Predict and act—identify and deal with specific climate projections
Work with city as a clearly defined space and administrative unit
Meetings with decision makers and experts
Take climate projections (including downscaling) as a starting point for assessing vulnerability
Stepwise process that leads from identifying vulnerability to specific actions
Knowledge and information is primarily generated and owned by experts
Mainstreaming into official state plans
Training and transfer of technical skills
Interventions are conducted at the level of cities or smaller, specific pockets of action
Specific intervention actions to address an identified vulnerability
Targets beneficiaries of project interventions

Urban Climate Change Resilience
Capacity to learn and reorganize in the face of uncertainty
See urbanization as a transformative process changing socio-economic systems that are not defined by a specific geographic location
Public dialogue processes
Take system function and current vulnerabilities as the starting point for assessing future vulnerability within the context of potential changes (i.e. climate change)
Iterative process that allows for ongoing assessment of vulnerability and implementation of interventions that build on each other
Support citizens and individuals in generating their own knowledge by promoting public access to information
Creating conditions for climate resilient policy and planning at multiple scales
Building flexible and learning-oriented institutions
Interventions recognize relationship between cities, broader ecological systems, and economic landscapes
A range of related activities, including adaptation, to build the capacity to respond to a range of scenarios
Aims for ‘beneficiaries’ to be partners in framing, implementing, monitoring and assessing actions

The impact of projects in resilience processes extends beyond the specific project activities.

THE ROLE OF PROJECTS IN URBAN CLIMATE CHANGE RESILIENCE

Individual implementation projects play an important role in resilience processes. Projects, particularly those that directly involved poor households, produced tangible benefits related to improved services or facilities (e.g., new homes, better local drainage systems) that made significant changes in peoples' lives. Yet, partners observed that in many cases, two projects with the same activities could have very different outcomes, depending on context and how well they facilitated a process of learning (e.g. Hydrological Modeling projects in Da Nang and Quy Nhon produced very different outcomes). Likewise, two projects with different activities could contribute to UCCR in very similar ways by promoting multi-stakeholder coordination, cross-sector sharing, knowledge and capacity and building, and information provision. When reviewing projects, stakeholders often highlighted that key changes resulting from projects reflected not only tangible project outputs but also the resilience processes that went on around them.

This suggests that the role of projects in resilience processes extends beyond the specific project activities. In ACCCRN, the projects were only one element of a larger resilience building process that included a series of shared learning dialogues, vulnerability assessments, sector studies and pilot projects, and multi-stakeholder development of city resilience strategies. Reviewing ACCCRN projects within these processes suggests that projects play a number of important roles. Aside from the tangible benefits from each individual activity, projects provided entry points, incentives, credibility, risk-free spaces, and facilitation for supporting longer-term learning processes.

Entry Points

Projects provided entry points for new actors to become involved in resilience processes as well as incentives for others to remain engaged. Many organizations that had not previously engaged with considering the impacts of climate change and urbanization did so through ACCCRN and ACCCRN projects. This includes, for instance: projects on dengue fever with the health sector in Can Tho and Semarang; UCCR curriculum development in primary and secondary schools with education departments in Bandar Lampung and Da Nang city; and work on storm resistant housing with the Women's Union in Da Nang City. These opportunities to engage new stakeholders helped strengthen networks and overall awareness of climate change and urbanization risks in ACCCRN cities.

Opportunities to Learn by Doing

Projects provide an opportunity for the city to 'learn by doing' on a number of fronts, such as building technical skills and capacity. They also provide a space for stakeholders to learn how to collaborate and work together as well as a chance for stakeholders to see how their actions contribute to resilience. Across ACCCRN, individual projects helped build stakeholder capacity and understanding such that stakeholders expressed interest in continuing to engage in new ways of working.

Credibility

The ability to implement projects lent credibility to the city resilience strategy and emerging UCCR networks. Partners from Indonesia noted that in both Semarang and Bandar Lampung, the ability to bring funding to a city for demonstrative projects was critical to the success of ACCCRN. Without some funding for projects, ACCCRN would have been perceived as a 'talking shop' with little credibility.

Incentives

The funding related to projects becomes an incentive for cities. However, the amount of funding is critical. In ACCCRN, the relatively modest level of funding available for projects ensured that cities that expressed interest also found the ACCCRN concept compelling, which in turn, leads to a higher likelihood for the provision of match funding. Too much funding could have led to cities being selected on the basis of 'projects,' rather than the ACCCRN 'process.'

Risk-Free Spaces

Small grant-funded projects provided spaces and budgets for stakeholders to test new ideas within organizations that are often rigid and risk-averse. Representatives from the municipality in Chiang Rai highlighted this issue, where the small project budget offered by ACCCRN allowed them to test an unconventional approach to Kok River restoration. Officials would have seen this approach as too risky under municipal budgets.

Taking Advantage of Windows of Opportunity

Resilience relies on addressing large-scale systemic changes, and, as a result, can require changes that may be difficult to enact for political or other reasons. Good resilience programs look for windows of opportunity where they can leverage existing processes or events to enact additional changes. In politically charged environments, projects provide stepping-stones for mutual understanding and building consensus.
There are several examples in ACCCRN where the process of building consensus on a small issue allowed stakeholders to later address more complex or controversial issues. In Hat Yai, collaboration on a citywide early warning system helped build capacity for collaboration that later enabled the city to address the issue at the river basin level. In Can Tho, a concern about salinity intrusion helped stakeholders collaborate around a salinity monitoring system; when it showed there was little need to worry about salinity in the near future, stakeholders in Can Tho were then able to move forward and address other more pressing issues.

Facilitation

Resilience requires sustained facilitation. Facilitators, including external organizations and local leaders, help connect people and ideas, build trust among stakeholders, manage conflict, ensure that conversations and actions are grounded in context, and communicate visions amongst all stakeholders. Facilitators can function at multiple levels (city, national, and regional). In all ACCCRN cities, the country coordinators played a key role in convening and facilitating city stakeholders throughout the process. At the city level, facilitators help establish trust among a network of partners, provide mentorship, keep momentum long-term, and 'connect the dots' across a range of activities. At national and regional levels, facilitators can help share techniques, best practices, and lessons learned through broader networks. Projects, as the source of much of the ongoing activity in a city, also provide a venue for continued engagement with and facilitation of resilience processes.

Experimenting and Learning from Projects in Da Nang City

The Da Nang Women's Union is becoming a more adaptive organization through increased understanding of climate change and capacity to monitor and learn from their work.

Before joining the ACCCRN project, the Da Nang Women's Union had considerable experience in managing revolving loans for poverty-reduction programs commissioned by international organizations, NGOs, or the provincial government. These projects provided new income-generation opportunities or facilities, such as latrines, for poor households. Members of the Women's Union approached the ACCCRN working group to propose a project that would build their capacity for integrating climate change into this work. After an iterative process of project planning and design with country coordinators and donors, a project was approved for the Women's Union to establish a revolving fund for constructing or renovating new houses to storm resistant standards.

This was the first foray by the Women's Union into housing loans and first chance to make climate change a core part of their regular work. Previously, the Women's Union operated as the implementing partner. The main indicator of success for these projects was the loan return rate. In contrast, ACCCRN required that the Women's Union develop its own proposal, deliberate on desired outcomes, and monitor and evaluate the program's success. Leaders of the Women's Union worked with country coordinators to develop a monitoring and evaluation framework that focuses on improvement in the quality of life of their borrowers as the main desired outcome and uses focus groups and interviews to assess this. For the first time, the Women's Union is also beginning to input household profile data into a simple spreadsheet that helps them to assess how well they are reaching their target group so that they can make program changes as necessary.


Resilience is a pathway to better city management and planning.
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Disaster Prevention And Mitigation Center
ศูนย์ฝึก อปพร.
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CITY BY CITY

The following case studies highlight experiences developing, conducting, and implementing intervention projects in cities across the ACCCRN Network.

- Collaboration, Information, and Policy Change in Can Tho City
- Learning from the past, advocating for Policy Change in Quy Nhon
- Improving Information for Urban Management in Da Nang City
- Space for Experimentation with Multiple Stakeholders in Chiang Rai
- Creating a Multi-Stakeholder, Information-Sharing Platform in Hat Yai
- Improving Urban Governance from the Grassroots in Gorakhpur
- Building New Networks to Tackle Challenges in Semarang

VIETNAM

Collaboration, Information, and Policy Change in Can Tho City

Generating, sharing, and making information accessible to the public has been a central strategy to building UCCR in Can Tho City. ACCCRN has provided a platform for unprecedented forms of collaboration and supporting informed changes in policy. Can Tho City lies at the heart of the Mekong Delta. It is the fifth-largest city in Vietnam and growing rapidly. Traditionally a center of agriculture, forestry and fishery, the Can Tho economy is moving increasingly toward commerce, service, and construction.

In 2011, Can Tho City established a Climate Change Coordination Office (CCCO). The leader of the office, Mr. Ky Quang Vinh, is the former head of the Environment and Natural Resources Monitoring Center within the Department of Natural Resources and Environment. His professional background gave him a strong appreciation for the way that data and information can be used to change behavior and influence policy.

As is generally the case in Vietnam, departments in Can Tho have always been reluctant to share information freely among each other. The CCCO took the lead to challenge this culture by establishing a website and online database, the first of its kind in Can Tho, and making data accessible from the Environment and Natural Resources Monitoring Center. This transparency and open access helped build trust among a variety of agencies. Other activities under the CCCO project, such as expanding the climate change information database and CCCO website, developing city climate resilience indicators, and drafting other ACCCRN project proposals were designed to bring together and foster additional sharing among these stakeholders. The Department of Construction, Department of Agriculture and Rural Development, Ninh Kieu District, Department of Health, and Department of Natural Resources and Environment have all made data available on the CCCO website, which now includes:

- Hydro-meteorological data, including daily rainfall, temperature, humidity, and water level data from 1978;
- Social economic data, such as population, growth, investment, and land-use;
- Sectoral statistics and annual reports for agriculture, transportation, industry, and health sectors;
- Real time salinity information for surface water;
- Weekly surface water quality data; and
- Climate change vulnerability assessments.

Data is still not fully unrestricted. Accessing hydro-meteorological data, which is increasingly valuable with the growing number of climate change projects and research efforts, still requires a payment to the Department of Environment and Natural Resources. Yet, it is the first time that technical staff, researchers, or NGOs working in Can Tho have a central database from which to access data, rather than sourcing and buying data across a variety of agencies. Moreover, the practice of sharing data is challenging the conventional impulse for each department to hoard data as a source of political power and fees. Rather, agencies that are actively sharing and working together, such as the CCCO, have gained prestige, new projects, and partnerships.

The CCCO has also looked for opportunities to improve coordination in other areas, using ACCCRN projects and budgets as a platform. For example, the CCCO was charged with coordinating Can Tho's long-term Climate Change Action Plan (2015–2030). They used CCCO funding under ACCCRN to support sector studies to bring together officials from Ninh Kieu District (Can Tho's central business district) and the Department of Construction, which is responsible for

urban spatial planning. Conventionally, the two agencies had developed their plans in isolation, leading frequently to conflict and discrepancies (especially around land-use). Meeting about long-term climate change plans under the CCCO's roof was the first time that these two agencies had directly worked together on any kind of planning. They have agreed to collaboratively conduct a vulnerability assessment for Ninh Kieu and have nominated staff from both agencies to work on this.

One ACCCRN project has focused specifically on making information public and bringing local farmers into the process of data generation—with new, credible information leading to policy change at the provincial level. City officials have long been concerned about possible saline intrusion into surface water supply, with possible impacts on urban water supply, industrial zones, and agriculture within Can Tho's boundaries. Though there were already systems in place for tracking the issue in other Mekong Delta provinces, these systems were expensive and poorly coordinated. A number of climate scenario studies developed by researchers suggested that that saline intrusion would not impact Can Tho for several years into the future. In 2010, however, saline intrusion was detected at Hau Giang 12 km away from Can Tho City. This prompted departments to begin planning immediate actions to mitigate impacts of salinity: such as conducting a study on altering land use to accommodate saline, changing to saline resistant crop varieties, and shifting from rice to aquaculture cultivation.

Recognizing the need for credible information on salinity intrusion, the CCCO and Environment and Natural Resources Monitoring Center proposed establishing a real-time salinity monitoring system. Installation of the system required participation from a variety of stakeholders, including the Can Tho Software Park, Department of Agriculture and Rural Development, Department of Transportation, the Centre for Hydrology monitoring, Can Tho television stations, and the DRAGON Institute to agree on installing and protecting the monitoring system. It consists of eight monitoring stations each equipped with a wireless telemetry, connecting to the CCCO website and updating every 30 minutes. Public officials, farmers, and other water users are able to access this information freely online.

After 6 months, monitoring results showed definitively that saline levels remain negligible in Can Tho City. However, periodic salinity increases at some stations more than others helped city researchers recognize that certain districts in the western part of the city are more susceptible to saline intrusion than districts in other parts of the city.

These results have lead to a broad reconsideration of implementation priorities. During a workshop convening provincial and district agencies concerned with saline intrusion, representatives agreed to shift their attention away from saline and towards water contamination from other sources. In particular, they now aim to reorient ACCCRN and local department budgets to:

- Improve enforcement of water discharge into the river from the upstream industrial park in O Man district;
- Extend the water supply system to connect to households in peri-urban areas; and
- Raise awareness to prevent local households from dumping solid waste directly into the river.

Concerns about saline intrusion for Can Tho have been eased for the moment. Yet, the economical, efficient, and credible model demonstrated in Can Tho provides a model for developing a regional program in the Vietnam Mekong Delta. With support from IFAD, the salinity monitoring system is being expanded to neighboring Ben Tre and Tra Vinh provinces, which both face a much more immediate danger from saline intrusion. The system will allow these provinces to assess saline risks and act collectively using credible, real-time information.

VIETNAM

Learning from the Past, Advocating for Policy Change in Quy Nhon

Quy Nhon provides a model for how city stakeholders can learn and apply lessons from grounded, local knowledge with support of technical tools, such as GIS and modeling, and learning from past disasters. It begs a question of how and whether and better information can influence highly political decision-making processes around land-use.

Quy Nhon is a scenic, coastal city of under 300,000 people. Its economy is shifting away from its historical base of agriculture, fisheries, and forestry, toward industry, trade, seaport, services, and tourism, changing the livelihood opportunities of residents. The city is now recognized as one of three key trade and tourism hubs of central Vietnam, after Da Nang and Nha Trang. New economic zones and transportation infrastructure are assuring Quy Nhon's precipitous integration as a major regional economic hub.

Urban expansion has concentrated in formerly rural communities north of the city's historical center. Low lying rice fields have been converted to urban wards, signaling investment and raising the price of land. Developers and private households are raising and filling land for individual houses, new urban development, and roads. The city's Thi Nai Lagoon, which provides drainage to the east for seasonal floods, is being increasingly encroached and filled. Under the City's master plan, expansion will continue to the north of the city.

The ACCCRN climate change working group had already begun to consider the potential flood risk of its planned expansion. A number of individuals, particularly within the Committee for Flood and Storm Control and the Department of Natural Resources and Environment, were very concerned that the planned extent and direction of development would heighten flood risks, displace households who depended on the land and the lagoon for their livelihoods, and would degrade the lagoon eco-system (the city's largest fishing resource). The issue of expansion was thrown into the limelight, when in November 2009, Typhoon Mirinae landed on the coast of central Vietnam. The resulting flood killed seven people and caused roughly $21 million USD (374.5 billion VND) in damage in Quy Nhon city alone, largely due to flooding within the Ha Thanh river. One of the houses severely flooded belonged to the city's chairman.

Recognizing the risk, the Binh Dinh Province People's Committee issued a temporary moratorium on ongoing development to the west of Thi Nai lagoon and further study on the risks associated with northward expansion. Yet, there was little information about what made this flood so severe, and explanations of earlier assessments for the master plan did not account for what had happened. The ACCCRN city working group took this as an opportunity to conduct further analysis.

A team of one international researcher and one local planner conducted site visits and 30 interviews with people who had witnessed the 2009 flood. This allowed them to map chronology of the flood using satellite images to determine the main aggravating factors of the disaster. Findings from the study and available data on rainfall, elevation, and stream flow were applied to develop a model of the delta. Researchers ran scenarios on the hydrological model to assess the impacts of a similar flood event under 2012 conditions as well as the potential impacts of flooding under planned development and climate change scenarios (DiGregorio, 2013; DiGregorio & Van, 2012).

Satellite maps and hydrological models confirmed observations made by many people living in the floodplain: New construction and the lack of flood early warning systems strongly exacerbated the level of flooding and the degree of damage.

The more fundamental cause of the 2009 flood's severity was uncoordinated urbanization and infrastructure development in the low-lying floodplains of Nhon Phu and Nhon Binh. As a result, the research recommends pursuing an approach to urban planning that preserves drainage, floodways, and green spaces to minimize the level of damage to people, their homes and assets, and other high-value development during a flood. It proposes: preserving green space that can function as parks, ecological zones or recreation areas; building more densely in elevated areas rather than infilling large areas in the flood plain; and scaling back urban developments that divert or slow drainage into the Lagoon. The research has implications for other Vietnamese cities as well, many of which are expanding in a similar way. It argues for instance that planning standards need to be based on extreme events like the 2009 flood, rather than on probabilities based on historical experience.

An early assumption was that the evidence from the research would allow CCCO to convince the People's Committee to alter its city developments. Researchers and the CCCO presented their research on several occasions, however they were met with limited participation from high-ranking officials and limited feedback.

Acknowledging the constraints of an approach that relies primarily on presenting information, CCCO and ISET-International sought different channels to communicate and influence. CCCO sought to convene members of other departments, decision-makers, and influential people in the city. For instance, they engaged former Peoples' Committee chairmen, who retain a high-level of influence in the city, to review some of these issues.

They also realized the need to pull in members of the media. Local TV reporters and journalists were invited to workshop. One journalist, in particular, took an active role in considering these challenges and published on numerous occasions about the study's results and threats from climate change.

Authors of the report have presented their findings on a number of occasions, and printed and disseminated reports widely.

ISET-International has supported the development of policy briefs and press releases to inform political leaders and alert the public on the issues raised by the study. An informal coalition was developed that supports this research, including members of the original ACCCRN working group, but also others: Department of Investment and Planning, commune level officials, one vice chairman of the People's Committee, Department of Agriculture and Rural Development, and Hydro-Meteorological Center.

Recently, the Provincial People's Committee released a Resolution that the city would develop to the west, towards Thuy Phuoc Ward, rather than to the northeast. While this offers a strong recommendation and framework for further planning, in reality there will still be further negotiation at the local level for expansion into flood prone areas.

VIETNAM

Improving Information for Urban Management in Da Nang City

Like Quy Nhon and many Vietnamese coastal cities, Da Nang is expanding toward the coast and lowland plains. The largest economic hub of the central region, its landscape has undergone rapid transformation and reorganization in the last two decades through infrastructure projects, real estate development, and the expansion of service sector industries such as tourism. Urban development under the city's Master Plan will expand to low-lying areas toward the south. As in Quy Nhon, land is in-filled and raised, making it higher than the surrounding area.

Outside of ACCCRN, the Working Group commissioned the Southern Institute for Water Resources Research to develop a basic hydrological model for Da Nang city under climate change scenarios. The study showed that new development areas in Cam Le district were vulnerable to flood risk under the climate change scenarios considered.

Concerned about the impacts of flooding, representatives from the Department of Construction approached the ACCCRN working group and ISET-International about supporting infrastructure that would help them adapt the new development areas for greater protection from floods. ISET-International introduced the idea of a hydrological model that would allow the Department of Construction to better evaluate the flood risks associated with urban development under climate impacts. Proposing this, ISET-International staff aimed to reframe the technical problem articulated by the Department of Construction to a broader consideration of development trajectories.

The ACCCRN project initiated a partnership between the Da Nang University of Technology and the Department of Construction, with technical oversight from ISET-International and the Southern Institute of Water Resources Research. To prepare the model, local researchers assembled hydrological, meteorological, and hydraulic data that was previously unavailable or housed in disparate institutions to create a useable source of information for planners.

The data has been used to extend and update the earlier basic model, integrating it with GIS to simulate hydrological scenarios for the Da Nang river basins. It is paired with an updated hydraulic city model. The paired model provides a basis for developing 10 scenarios of climate change and urban development plans.

As envisioned, the model provides new information for planners to incorporate climate change into planning decisions. Staff from the Department of Construction persuaded city leaders to increase the height of a new planned bridge despite increased costs, using the model to show the potential extent of flooding under climate change. Department staff recognized that they would not have been able to make this argument without the tool. To institutionalize use of the model, the Department is currently preparing a multi-agency guidance document to establish a process of calculating and integrating climate change impacts into socioeconomic development projects. They will also establish a set of regulations for approval by the People's Committee that would require review of the model before all new urban construction and transportation plans receive approval.

While some of these changes are promising, there is still limited discussion of how stakeholders can use the model to evaluate the city's urban development trajectory more broadly. ISET hosted a policy roundtable intended to raise these concerns to leadership in Da Nang. Yet, it is clear that leaders in Da Nang are more likely to consider technical changes to discrete infrastructure projects rather than major changes to approved master plans.

THAILAND

Creating a Multi-Stakeholder, Information-Sharing Platform in Hat Yai

In Hat Yai City, an informal multi-stakeholder group used projects to expand, strengthen, and build the credibility of its networks, address urgent issues in the city, and initiate a dialogue on addressing vulnerabilities at the regional scale. Hat Yai often experiences severe flood disasters. A major flood in 2010 damaged more than 30,000 homes and resulted in 36 deaths. In recent years, the magnitude and intensity of floods have significantly increased in comparison to the historical record.

ACCCRN helped strengthen an existing network with members from the municipality, Chamber of Commerce, provincial community foundations, university faculty, and a regional meteorological center, who had a shared interest in addressing flood risks and had collaborated together informally in the past. When forming a group of stakeholders for ACCCRN, they drew on this existing network and expanded by sending specific invitations to individuals within key organizations. ACCCRN provided them an opportunity to formalize this network and to engage through public processes such as SLDs. This stakeholder group retained their focus on enhancing the city's capacity to prepare for and respond to major flood events. Over time, they recognized the need to work with surrounding municipalities affected by the flood.

The intervention projects in Hat Yai have helped strengthen, expand, and provide credibility to this network. With support from ACCCRN, the Working Group established a Climate Change Resilience Learning Center. The Center provides a space for convening meetings across agencies, different layers of government and municipalities. Many of these agencies had never collaborated previously and, in many cases, saw each other as rivals or competitors. Stakeholders shared that ACCCRN projects and the physical center provided a neutral space for engaging with each other across such boundaries.

The ACCCRN-supported Hat Yai City Climate website developed by the center has become a well-regarded and widely accepted source of real-time disaster information. The working group installed a real-time flood monitoring system, with CCTV cameras at various upstream locations allowing web users to monitor the height of floods. This intervention responds to failures by the government in previous floods to provide timely information that would allow businesses and households to make decisions and prepare for floods. The website also provides an announcement board for conservation events that aims to raise awareness and build the capacity of communities in Hat Yai City to respond to disasters.

The group of diverse institutional and organizational representatives as well as interested individuals engaged in the SLDs in Hat Yai evolved into a strong network that is most interested in finding sustainable solutions to the flooding issues. As in Can Tho and Gorakhpur, the enhanced trust between stakeholders is perhaps best illustrated by the practice of information and data sharing that has emerged. One stakeholder shared that while many of the agencies involved previously did not share data among themselves and formal information requests could take up to weeks, they are now able to contact each other and request information immediately.

Networking is moving beyond the city to the river basin level as partners recognize that they must address root causes of flooding. In addition, there has been a notable shift in how city stakeholders think about flood issues. While the term 'urban climate change resilience' does not translate easily into the Thai language, partners shared that there is a developing understanding within Hat Yai that 'resilience' is a state that extends beyond the life of any one project.

THAILAND

Space for Experimentation with Multiple Stakeholders in Chiang Rai

Chiang Rai illustrates how ACCCRN projects helped strengthen collaboration across city stakeholders and spread the risks associated with testing unconventional approaches. Chiang Rai City is located in a peaceful northern Thai province. Over the last decade, Chiang Rai has experienced a rapid change in land use patterns as a result of a shift towards large-scale mono-crop agriculture, industrialization, and tourism around and within the city. The change has affected air and water quality across the whole province. Chiang Rai's designation as a key gateway to the ASEAN Economic Community (AEC) ensures that development and urbanization will continue.

Despite the multiple political and economic incentives for development, the city of Chiang Rai has taken steps to preserve the abundant natural resources and unique Northern Thai-Lanna culture in the city. ACCCRN began by engaging a wide collection of stakeholders in discussions about the future of the city and strategies for addressing them. These multi-stakeholder dialogues were unprecedented opportunities for different agencies and local civil society groups to regularly come together, share their critical concerns, and dialogue around emerging issues of development, climate change, and land use.

The first ACCCRN project in the city, a restoration of the Kok River that runs through town, broke away from the more typical approach to flood management and restoration that involves the construction of large-scale, concrete infrastructure to take an ecosystem management approach. Under the project, the Kok River, which had previously been the source of multiple flood events and a cause for concern among city residents and officials, is being restored to a more natural and healthy state. The new management approach includes a suite of activities, such as the conservation of fisheries and wetland, improved land use planning, river bed restoration, development of recreational activities, flood protection, and consistent monitoring and maintenance. The management of the restored river will be shared between the city and the local communities, encouraging awareness and ownership of the project.

The ACCCRN project provided a platform for demonstrating non-infrastructure solutions to riverbed erosion—a new and unconventional approach. For the municipality, the external source of funding and the ability to spread the reputational risk of failure to multiple players made it possible to approve and experiment with a new approach.

Recognizing the success of multi-stakeholder engagements facilitated by ACCCRN, Chiang Rai municipality is moving toward developing a climate change resilience learning center for providing public information related to flood, water, climate, and urban agriculture.

INDONESIA

Building New Networks to Tackle Challenges in Semarang

In Semarang ACCCRN has built networks that include the most strategic and influential stakeholders in the city, such as the mayor, city secretary, city development and planning agency, and city environmental agency. Trust and capacity to address UCCR has been built through shared learning with other government sectors, local NGOs, and academic institutions.

City planning processes often include decisions that will affect multiple, and often conflicting interests. In cities that are experiencing urbanization and climate risk, the ability for government officials to understand the importance of climate resilience building and anticipate future risk is critical to helping develop a realistic and sustainable master plan for development. Decision-makers will be faced with choices that pit short-term commercial interests against the needs of long-term resilience building. This becomes particularly complicated where decision-making is not transparent and where external lobbying has undue influence on governance and planning. When money and powerful interests are able to lobby effectively, their influence may exceed that of civic leaders. When this happens, the concerns of short-term interests can overwhelm long-term resilience planning.

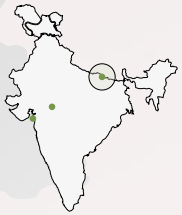
In Indonesia, as elsewhere in the world, private sector lobbying like this is not unknown. In early 2013, the motivation and influence of the ACCCRN city team was tested when a prominent national corporation wanted to invest in a big residential and industrial complex on a mangrove conservation site. This site had been in a state of rehabilitation with ACCCRN funding, with the intention that it would become part of a wider flood and storm hazard management system.

Normally, a request for rezoning would be put to the municipal spatial planning office; however, in this case, the new mayor granted rezoning permission after he was lobbied directly. Yet, the corporation had not considered the social or environmental impacts of its plan, such as clearing a natural storm and flood buffer and eliminating livelihoods in small fish farming. The lobbying effort also failed to consider impacts on other existing hazards, including land subsidence and tidal flooding.

Recognizing the potential impact of this land conversion, the ACCCRN city team engaged the impacted communities and developed a negotiation and advocacy strategy to reverse the mayor's decision. The demand to reject the corporation's lobbying came from both city officials and villagers at the mangrove conservation site. This 'top-down and bottom-up' approach was new for the city and quite effective. The negotiation and advocacy process took several months, but it resulted in the revocation of permission for construction. Now, the city team has time to prepare clearer and stricter regulations for city planning and management. However, everyone involved acknowledges that work needs to continue on building capacity and understanding of key issues, particularly for decision-makers.

The city team was able to effectively reject the corporate proposal because they could see that the impact would extend beyond today into the next ten to twenty years. They understood that if allowed to proceed, this project would lead to worse tidal floods and increased land subsidence. Furthermore, if this project were successful, it would set a precedent for more shortsighted investment and installation of infrastructure that could ultimately damage other economic and social sectors. The city team successfully argued that there are benefits to zoning a specific area as a conservation site and that cost-benefit analyses must incorporate additional factors beyond those used for commercial purposes. Even things that may benefit people in the short-term could greatly reduce city resilience in the long-term. For the city teams, resilience planning is not another 'hot topic' they have latched onto; it is a pathway to better city management and planning. They understand that their work is to ensure that Semarang develops and creates a truly resilient foundation for its future.

INDIA



Improving Urban Governance from the Grassroots in Gorakhpur

The approach in Gorakhpur focused on expanding knowledge and changing the behaviors of residents, creating models of good urban management at a grassroots level, and thereby creating a body of informed, engaged citizens who are able to advocate for urban services on their own behalf. The particular theory of change was unique in ACCCRN, in putting citizen engagement (or 'people-centered resilience') at the heart of their approach.

Gorakhpur, a medium-sized city in eastern India, is plagued by flooding and annual waterlogging. Lack of proper solid waste management has only compounded the issue that leads to other problems of drinking water contamination, an increase in vector borne diseases, and losses to poor people.

Within ACCCRN, the Gorakhpur Environmental Action Group (GEAG), a city-based NGO, was able to study and link the myriad problems facing the citizens of Gorakhpur. ACCCRN utilized participatory learning and action tools to involve citizens in the development of a city resilience strategy that explored the causes and linkages between various issues faced by Gorakhpur. The city steering committee that was formed under ACCCRN to guide these activities is still functional and the members meet at regular intervals to discuss new issues and strategies to continue building the resilience of the city.

A project titled "Decentralized Ward Level Resilience Planning in Mahewa" utilized the concepts of resilience building in one of the low-income wards of Gorakhpur city. The project supported residents to form a Ward Level Committee, a very local unit of government envisioned under the country's 74th Amendment, but rarely implemented in practice. This citizen committee, along with GEAG staff, supported residents in diversifying sources of income and improving hygiene practices. As a result of this pilot initiative, improvement in drainage, solid waste management, drinking water, and adaptive agriculture practices have been observed. As a result of improved drainage infrastructure, residents did not experience severe flooding in 2012 despite the heaviest rainfall in years.

The Mahewa ward project was not intended to simply provide services, but to fill gaps in state provision of services by building citizens' capacity to advocate on their own behalf and improving community-government coordination. Residents of Mahewa ward are now aware of various issues concerning the ward and have sought action from the Municipal Government. Residents are involved in monitoring the technical specifications and budgets of service delivery as well as in advocating for overall change.

Another example of citizen action to improve governance is the formation of Mahanagar Paryavaran Manch (City Environment Group) that includes eminent citizens from various walks of life as members. This group advocated for, and has been successful in, getting illegal encroachments removed from the Ramgarh Lake, and also in helping the city government secure a large grant for lake restoration.

For GEAG and other city partners, the assessments under ACCCRN highlighted the complex linkages between urban and peri-urban zones. They observe that to reduce waterlogging within the city, it is important to maintain the open and green spaces in the peri-urban zone that are rapidly being developed. To support this, ACCCRN projects are helping farmers adopt innovative farming techniques that would withstand water-logging, helping people design and build flood resistant housing, and providing city management with critical information such as future flood modeling scenarios that address current development patterns. Together, these activities are helping engagement and participation with and by citizens from all parts of Gorakhpur as they seek to address key challenges in their future.


The most significant changes were related to process or project design elements that allowed for greater learning, collaboration, and sharing of information.

PROJECTS THAT BUILD RESILIENCE

In developing this report, ACCCRN partners, including city stakeholders, country coordinators, and regional partners, were asked to comment on the most significant changes that came out of intervention projects. While partners did underscore the value of specific tangible benefits that came out of projects, many of the most significant changes were related to process or project design elements that allowed for greater learning, collaboration, and sharing of information. Looking across the most significant changes as reported by ACCCRN partners, there are common themes that emerge. These themes extend across different kinds of projects throughout the ACCCRN portfolio and can be understood not just as important changes from the ACCCRN program, but as the core elements or common characteristics that ensure projects go beyond specific activities and contribute to building resilience.

Based on experiences with conducting projects in ACCCRN, the 'core elements' that ensure a project contributes to resilience include:

- Tangible improvements;
- Capacity to learn and reorganize;
- Future-oriented approaches that consider complexity and uncertainty;
- Collaboration and network building;
- Citizen access to information;
- Effective citizen engagement; and
- Distinct understanding of urbanization and resilience.

The experiences in ACCCRN also serve as case studies, illustrating how these core elements of implementation projects helped build resilience in cities. Each of the core elements listed above are explored in further detail on the following pages.

Tangible activities have impacted and improved peoples' lives

First and foremost, projects gain credibility by delivering tangible benefits that measurably impact and improve peoples' lives. While projects may contribute to collaboration and learning, the specific benefits delivered by the project ensure that project partners, as well as others in the city, recognize the project's value. For projects that directly involve poor households, tangible benefits related to improved services or facilities were frequently seen as making the most significant changes in peoples' lives. This was evident for instance in Mahewa ward in Gorakhpur, where residents did not experience severe flooding in 2013 despite the heaviest rainfall in years, due to improved drainage infrastructure that had been put in under ACCCRN.

These tangible impacts can be measured quantitatively, however, sometimes benefits are better measured through qualitative assessment. For example, borrowers in the storm resistant housing project in Da Nang city expressed that the most significant change for them was the safety and satisfaction gained from their new or improved homes. Homeowners in Da Nang strongly emphasized that they no longer worry, as they did previously, when they receive a storm warning. Similarly, a cost-benefit analysis showed that the construction of a boat winch in Da Nang City designed to haul fishing boats to the shore during storms will have a positive return on investment only after several years. However, the main benefits expressed by fishermen related to the peace-of-mind gained from having such a machine, and the benefits of coming to shore earlier to help their families prepare their homes before a storm.

Enhancing capacities to learn and reorganize based on evidence

As climate change and urbanization increasingly point to a future that is uncertain and unpredictable, successful management in cities will require not only strong governance processes, but also the ability to learn new skills and reorganize as new insights, evidence, and learning emerge. Cities, organizations, institutions, and stakeholders need to be able to learn and reorganize based on their own experiences in the city as well as gain insight from other cities' experiences dealing with similar issues.

In some cities, this ability to learn develops as planning or assessment processes (e.g., infrastructure design, municipal budgets) start to include considerations for climate change projections where they did not previously do so. Within ACCCRN, analysis developed through the climate resilience process prompted the health department in Semarang to reframe its strategy on mosquito eradication. Whereas Semarang's projects were initially selected based on a city resilience strategy that included a priority list of intervention projects, the health project was later selected based on a newly identified need relevant to climate change that emerged after the resilience strategy was developed. Planners in Da Nang's Department of Construction are using a hydrological model to help other departments revise infrastructure designs. Efforts are underway to require all new infrastructure plans to consult this model before they are finalized. As a result, the People's Committee issued a new resolution directing the city to expand toward the west rather than the north, after a similar hydrological model demonstrated the risk of expansion into the city's northern flood plains. In contrast, salinity monitoring in Can Tho demonstrated that concerns about saline intrusion in the immediate future were overstated. This has helped redirect infrastructure priorities to more pressing issues of water quality and access, while continuing to learn about saline intrusion risks through regional monitoring with neighboring provinces.

In other instances, project partners have established new processes for learning from and revising their work. In Da Nang, the Women's Union is developing new qualitative and quantitative metrics and systems for monitoring their projects, including but also beyond the storm resistant housing project, in order to improve their work and inform future endeavors.

Future-oriented approaches that consider the complexity and uncertainty associated with climate change and urbanization

For projects that address climate change and urbanization, it is not possible to develop detailed and accurate forecasts for the future. The ways in which urbanization and climate change will impact cities is complex and unpredictable. Because it is not possible to understand how these issues will change risk with any certainty, it becomes increasingly important to tackle existing risks in the present. Within ACCCRN, this was evident in Can Tho, where the leader of the Climate Change Coordination Office adopted a new perspective on climate change that emphasizes reducing damages rather than the more conventional perspective of reducing exposure to hazards. The office is focused on supporting 'no-regrets' activities that provide positive outcomes regardless of the magnitude of climate impacts, rather than more conventional infrastructural solutions. Similarly, in Gorakhpur, members of Gorakhpur Environmental Action Group suggested that conducting ACCCRN assessments enabled them to gain a greater appreciation of the complexity and interconnections between systems. This led them to develop a set of interventions addressing land-use in peri-urban areas as a means of tackling floods in the city center.

After projects switch to encouraging more future-oriented thinking, partners start to address not just the impacts of disasters, but also the underlying root causes. In most ACCCRN cities, disaster risk reduction was a key entry point for starting work on resilience. This made interventions like early warning systems and storm resistant housing an attractive starting point. Yet, for hazards such as floods, the severity of the resulting disaster is often the result of poorly planned and managed urban development. In ACCCRN, this increased understanding of the causes of flood spurred interest in reassessing urban planning processes and implementation. In Quy Nhon City and Binh Dinh Province in Vietnam, the ACCCRN vulnerability assessment, a grassroots analysis of an extreme flood in 2009, and a hydrological model helped a variety of departments and agencies understand their flood problem as a result of urban expansion into hazardous areas. In Semarang, city planners were able to engage with networks built in ACCCRN to collaborate with NGOs and university faculty members in modifying urban zoning and coordinating projects from multiple international donors to preserve the city's conservation area for drainage.

Uncertainty vs. Disagreement in Urban Climate Change Resilience

In both Da Nang and Quy Nhon, Vietnam, ACCCRN partners began with limited understanding of how climate change would impact their cities in the future. Vulnerability assessments and hydrological models reduced this uncertainty, highlighting that they were already close to their flood threshold, and suggesting that under any climate change scenario, flood risk would increase simply as a result of urban development trajectories.

In Quy Nhon, this problem reframing fit in with an existing debate on city expansion. The hydrological modeling project provided one side of this debate, represented by the Department of Natural Resources and its allies, to provide enhanced analysis to make their case to city leaders. The resulting research acted primarily as an advocacy tool. The model has not been adopted as a planning tool by the Department of Construction, who is responsible for urban planning and infrastructure decisions, or any other department. It is not being used to address smaller technical challenges.

Partners placed the emphasis on addressing the overall city system —a large-scale problem that is highly contested.

In contrast, the Department of Construction in Da Nang initiated this project with a different set of expectations. Their original proposal to ACCCRN focused on infrastructure design that would 'climate proof' development plans. Since developing the model, they have fully adopted the tool for planning, using it successfully to address discrete technical issues. There is hope that by addressing these smaller parts of the system, where there is a high level of consensus, stakeholders can later address issues in the larger system. Thus far, efforts to reframe this discussion have not gained significant traction.

Collaboration and network building across sectors and organizations

Projects that build resilience will help develop new formal or informal networks and institutionalize, strengthen, and expand existing networks. Within ACCCRN, these networks included government agencies and other organizations that had not collaborated closely before, and in some cases had harbored rivalries. In Hat Yai, ACCCRN provided a platform for actors who had informal relationships to engage legitimately and formally with each other as part of a city working group. An ACCCRN project further bolstered this by establishing the Hat Yai Climate Change Resilience Center, a neutral space for Hat Yai municipality departments, civil society organizations, provincial agencies, and neighboring municipalities to engage constructively with each other.

In Semarang, the city working group developed a strong network of NGO, academic, and city government partners through the resilience strategy development process—a network which, while not yet complete, is seen as the greatest legacy of the ACCCRN process. The new partnerships were developed to identify, design, and implement activities. Where project contexts were perceived as favorable, the process of engaging NGOs and other stakeholders as leaders and partners helped to increase government and community capacity. The creation of collaborative teams, with complementary skills, overseen and assisted by a transparent network, also led to a greater ability to complete such tasks as project documentation and management. The success of these projects has helped ACCCRN contribute to improved government policy. In Semarang, there is a sense that throughout ACCCRN, this engagement has been key, and there is still more room to engage additional actors, particularly from the private sector.

Likewise, as a result of ACCCRN, there is more collaboration between academics and government at the city level. In Chiang Rai and Hat Yai, academics have worked with the city to develop and implement a number of projects. In Can Tho, the CCCO was able to facilitate working sessions between overlapping agencies that in the past had developed plans without consulting each other. One key to facilitating networks lies in the ability to create neutral spaces, both physically and in terms of projects and policies, where all partners feel safe, equal, and willing to engage.

As understandings of urban climate vulnerabilities evolve, many of the original networks are now extending beyond the city. In both Hat Yai and Chiang Rai, partners realized that urbanization extends beyond the municipal jurisdiction and thus focused on building relationships across surrounding villages and municipalities. In Hat Yai, the working group is now seeking to extend its network to other provinces, as partners recognize that they must address root causes of flooding at the river basin level. In addition, ACCCRN work in Hat Yai and Chiang Rai provided momentum for additional Thai cities to engage in shared learning and discussion sessions designed to build greater capacity. In some instances, these learning exchanges have even included participants from outside of Thailand, including ACCCRN partners in Indonesia and Vietnam.

Mechanisms to generate, share, and expand citizen access to information

Citizens, organizations, and stakeholders that have greater access to information are more able to engage in their own actions, from advocacy to project implementation, that address the core challenges of a city. Throughout ACCCRN, real-time information on hazards such as flooding and salinity from sources trusted as credible and accurate became accessible and public, often for the first time.

Information sharing is one indicator of the growing trust among disparate stakeholders. There are often few institutional incentives for sharing data. In some cases, data is viewed as a source of power for the organizations that hold it. Agencies are often reluctant to share data freely, preferring to use it as political leverage or as a source of income. This creates a major challenge for planners and researchers needing to work across disciplines, as data must be sourced from multiple agencies often at a substantial cost. Even among other city departments, requests for data are bureaUCCRatic and require several weeks for processing.

Through ACCCRN efforts to promote information accessibility, stakeholders in Hat Yai observed a level of trust develop between actors from different agencies that had previously seen each other as rivals. Whereas requests for data had previously required long bureaucratic processes, working group members are now able to access it from each other though a simple phone call. In Chiang Rai, support from ACCCRN has led to the development of a climate change resilience learning center for providing public information related to flood, water, climate, and urban agriculture. In Can Tho, the CCCO sought to demonstrate that agencies could gain prestige, projects, and partnership by sharing rather than holding information. It took the lead by uploading environmental monitoring data to its database, available through the CCCO website. After two years, the website houses a variety of meteorological, socioeconomic, sectoral, and environmental data contributed by a number of departments (See Can Tho Case Study).

While many of these examples highlight data sharing between agencies, there is also significant value in ensuring data and information is shared, accessible, and in some cases owned by the broader public. A real-time salinity monitoring system in Can Tho provides information on saline levels in surface water through the CCCO website. Viewed as credible and reliable by all parties, the results from the monitoring system have led departments to reprioritize budgets aimed at mitigating saline impacts to addressing water quality in urban and peri-urban areas more generally. The Hat Yai City Climate Resilience Learning Center website has, likewise, become a trusted source of disaster information for the public. Previous flood warning systems had failed to alert residents of upstream floods. CCTV cameras monitoring flood gauges at several river locations are linked to the website, allowing residents to personally track the development of floods.

As new information and analysis becomes widely available, it can challenge conventional ideas about urban management and create an opening for new dialogues. The Climate Change Coordination Office in Quy Nhon city, with the support of ISET-International, has widely promoted results from an unprecedented analysis of flooding and urban development in the city, which suggests that the city's planned urban expansion was exacerbating flood hazards. This study, as well as the effort to share it with decision-makers, government departments, and the media, has prompted a policy debate in the city and has prompted changes to high-level policies.

Citizens engaging effectively

Projects that build resilience also promote effective citizen engagement in projects and processes. This extends beyond just hosting public information events or workshops to include opportunities for citizens to engage in, influence, and manage projects and project activities. When citizens are engaged in this way, they develop the skills, knowledge, and confidence to engage in and even lead their own efforts to build resilience. In ACCCRN, citizens were engaged in a number of ways that enabled them to more effectively contribute to their cities. In Hat Yai, citizen groups installed a CCTV flood monitoring system that prompted the municipality to take action by replacing and updating flood markers. In Gorakhpur, citizens have actively engaged in the design of ACCCRN interventions—developing their own waste management systems, organizing to lobby the state for service delivery, and monitoring technical specifications for new infrastructure provided by the state. Citizens groups have also successfully advocated for the removal of new developments from an important water body. In Semarang, a public movement in support of mangrove reforestation and conservation has been mobilized. The ACCCRN network in the city, led by the city spatial planning office, successfully lobbied and legally overturned a government decision made by the private sector and certain city authorities to convert an ACCCRN mangrove rehabilitation area to developed land. As a result, the mangrove area will continue its rehabilitation and provide an important storm and flooding buffer.

Putting urbanization and resilience at the heart of UCCR

UCCR stands apart from many other lines of thinking about urban development and improvement, including disaster risk reduction, mitigation, sustainability, and adaptation. In order to gain traction, UCCR has often built from city stakeholders' interests in other aspects of the climate change debate. However, resilience processes and projects should be able to highlight for stakeholders the long term challenges related to urbanization and climate change, and that the associated complexity and uncertainty requires new approaches. Through resilience projects, stakeholders should gain an increased awareness and understanding of urbanization and climate change as well as an interest in resilience as a pathway for addressing such complex challenges.

Within ACCCRN, many cities experienced this kind of shift in their thought processes. In Hat Yai, a heavy focus on flood disasters and how to reduce their impacts at the beginning of ACCCRN led to a recognition that floods were increasing in severity due, in part, to decisions about urban development and planning. This has led to a greater interest in reviewing urban planning and development processes and decisions in order to address similar kinds of issues before they arise. Similarly, in Semarang, while early information on climate resilience strategies suggested that ACCCRN was being used as a platform to promote and coordinate a number of projects the city was already interested in, the development of new networks and partnerships led stakeholders in the city to recognize the value of collaborating and being able to address problems in new, creative, and more forward-thinking ways.

CONCLUSION

The dynamic nature of urbanization and climate change, means that traditional methods of dealing with hazard and risk are no longer sufficient. For example, in a rapidly growing city, response and recovery plans may be designed to deal with the city at the time of writing, but the city will be a very different just one or two years later. Furthermore, variability and uncertainty in climate means that future climate disasters may be very different than any ever experienced (in terms of frequency, duration, intensity, and even form). As such, traditional mechanisms for predicting risks and disasters that rely on historical records are no longer valid. Equally, there are important dimensions to consider in how impacts and benefits of actions are distributed between different people and places. Most actions will have winners but also some losers. Building resilience can never be far from questions of social justice.

Resilience offers a new path for continued growth and development. While the concept of resilience has been studied by academics for decades, it has only recently been applied to urban and climate change issues. Recently, increased academic understanding of resilience and UCCR has been supplemented with practical knowledge developed through resilience programs such as ACCCRN. UCCR builds from an understanding that cities are complex and dynamic social-ecological systems. Within these contexts resilience is determined by the characteristics of individuals, sectors, and communities within a city as well as how they integrate and interact with each other. In order to build resilience, then, cities need to engage in comprehensive, collaborative processes that seek to understand the city as a system and how it is vulnerable, collectively chart a course for making improvements on targeted issues, and take actions and make changes to help the city address key issues. These processes should allow diverse groups and perspectives from throughout the community to discuss, consider, and make decisions about some of the more difficult challenges. Where these processes do not yet exist, creating the conditions for them to emerge can be a critical pathway to building resilience.

The specific actions taken to build resilience will often take the form of projects—sets of time-bound actions that require financial resources. Ideally, these projects are decided upon and designed through longer-term, inclusive resilience processes; however, some projects may occur separately or individually due the realities of available funding, time, and resources from sources such as governments, donors, and the cities themselves. Based on experiences in ACCCRN, it is likely that many of the projects undertaken to build resilience do not immediately stand out as being ‘resilience’ projects. Infrastructure improvements, mangrove restoration, and community education are implemented under any number of kinds of programs. But when these projects are implemented from a resilience perspective there are important additional elements.

Projects that build resilience will need to ensure they help build the capacity of people and cities to collaborate, learn, reorganize, and respond to change. In some cases, this may mean that the outcomes of the project change. A project that is designed to collect data about floods will contribute to resilience if it makes sure that the data is made available alongside other critical data in a public database. In other cases it may mean that the process to undertake the project is different. A project to restore mangroves will contribute to resilience

if it actively engages the local community in the assessment, planning, and execution phase of restoration such that the community gains capacity to adjust management practices as circumstances in the future change. Experiences implementing projects within ACCCRN highlight these core elements that help ensure individual projects contribute to resilience.

These new understandings have already begun to influence ACCCRN partners. Both country coordinators and regional partners have developed additional programs that incorporate this learning from their experiences in ACCCRN. As cities, practitioners, governments, and donors seek to develop new resilience programs, the experiences in ACCCRN provide valuable knowledge and first-hand experience that can contribute to process and project design that leads to better resilience. In this way, the global interest in resilience, and specifically UCCR, can be translated into more effective, sustainable, and ultimately influential projects.

This product was funded by, and produced in partnership with:

Started in 2008, the Rockefeller Foundation funded Asian Cities Climate Change Resilience Network (ACCCRN) worked in ten cities across four countries to "demonstrate a diverse range of effective approaches, processes, and practices for assessing and addressing urban climate vulnerabilities, and through this base of practice and knowledge to catalyze attention, funding, and additional actions for building urban climate change resilience in more places" (ACCCRN Program Brochure 2008). ACCCRN engaged country and regional level organizations as partners to support resilience building across the cities.

Working with ACCCRN partners, each city underwent a multi-phase process to assess and understand city vulnerability, develop a strategy for reducing vulnerability and building resilience, and to implement intervention projects that would contribute to resilience in the city. Thirty-eight intervention projects were undertaken across the ten ACCCRN cities. The projects undertaken were very diverse, and included projects focusing on mangrove restoration, flood modeling, environmental monitoring, citizen engagement, and storm-resistant housing.

Each individual project offered tangible benefits around their area of focus. However, specific elements related to project and process design ensured that these projects also contributed to the overall resilience in the city. These elements included a focus on collaboration, the capacity to learn and reorganize, and access to and ownership of information, among others. This report reviews the projects conducted under ACCCRN to better understand the characteristics of these projects that ensured they contributed to resilience. Understanding these elements can help cities, organizations, governments, and donors as they seek to build projects and programs that meaningfully build resilience in cities in Asia and around the world.

Journal Article: A Framework for Urban climate change resilience

http://tinyurl.com/o98b6fr

The Climate Resilience Framework: Training Materials
Website: Training.i-s-e-t.org

"Shared learning" for building urban climate change resilience—experiences from Asian cities

http://tinyurl.com/oh3dd7n

For more information please see:
www.i-s-e-t.org / www.ACCCRN.org