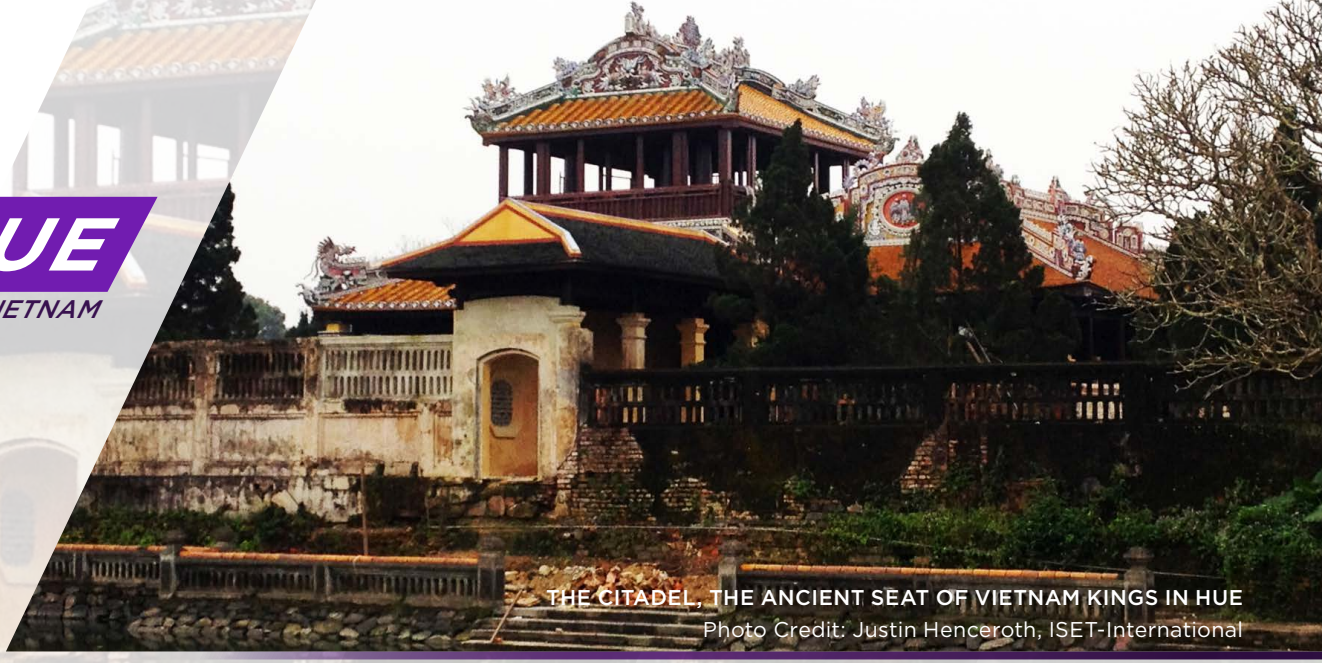
HUE

VIETNAM



THE CITADEL, THE ANCIENT SEAT OF VIETNAM KINGS IN HUE
Photo Credit: Justin Henceroth, ISET-International

Mekong – Building Climate Resilience in Asian Cities (M-BRACE)

The ancient capital of Vietnam, Hue City, is an important cultural and historic city located on the central coast of the country. A citadel, temples, and tombs of past Kings abound in the city, offering a peek into the past for locals and tourists alike. The same traits that made Hue attractive as a capital city in the past have led to the growing importance of Hue as an economic and industrial city in the central part of Vietnam. Hue is one of a few major cities along the central coast, located halfway between Vietnam's two leading cities, Hanoi and Ho Chi Minh City, and linked via rail and road to the rest of Vietnam and to other countries in the Mekong Region. Economic integration is driving rapid urbanization and expansion, especially outside the city and along the coast. Yet, the city's location at the foot of a mountain range, on the mouth of a major river and along the coast contributes to high exposure to climate change risk. Through the Mekong – Building Climate Resilience in Asian Cities (M-BRACE) initiative, Hue has been working to understand the impacts of urbanization and climate change and chart a path towards more resilient development.

M-BRACE

Mekong–Building Climate Resilience in Asian Cities (M-BRACE) is a four-year initiative funded by the US Agency for International Development (USAID) and implemented by the Institute for Social and Environmental Transition (ISET) in partnership with Thailand Environment Institute (TEI) and the Vietnam National Institute for Science and Technology Policy and Strategy Studies (NISTPASS). M-BRACE works in four cities in Vietnam and Thailand to develop and apply practical methods for building resilience in cities experiencing rapid urbanization and climate change. In Hue, M-BRACE worked with local stakeholders from government, the private sector, and civil society to conduct a vulnerability assessment focused on urbanization and climate change, implement resilience-building intervention projects, and design and adopt a formal Climate Resilience Action Plan for the city.

CLIMATE VULNERABILITY IN HUE

Hue has always been vulnerable to floods. The city experiences nearly annual flooding and residents have long ago learned to manage and live with periodic inundation. However, urban growth, climate change, and the changing role of major reservoirs are shaping the city, the topography, and the hydrology in Hue such that traditional patterns of water, rainfall, and flood will be increasingly variable, unpredictable, and possibly extreme. These changes mean that not only will flooding continue to be a challenge, but that the city also faces potential water shortages during parts of the year.

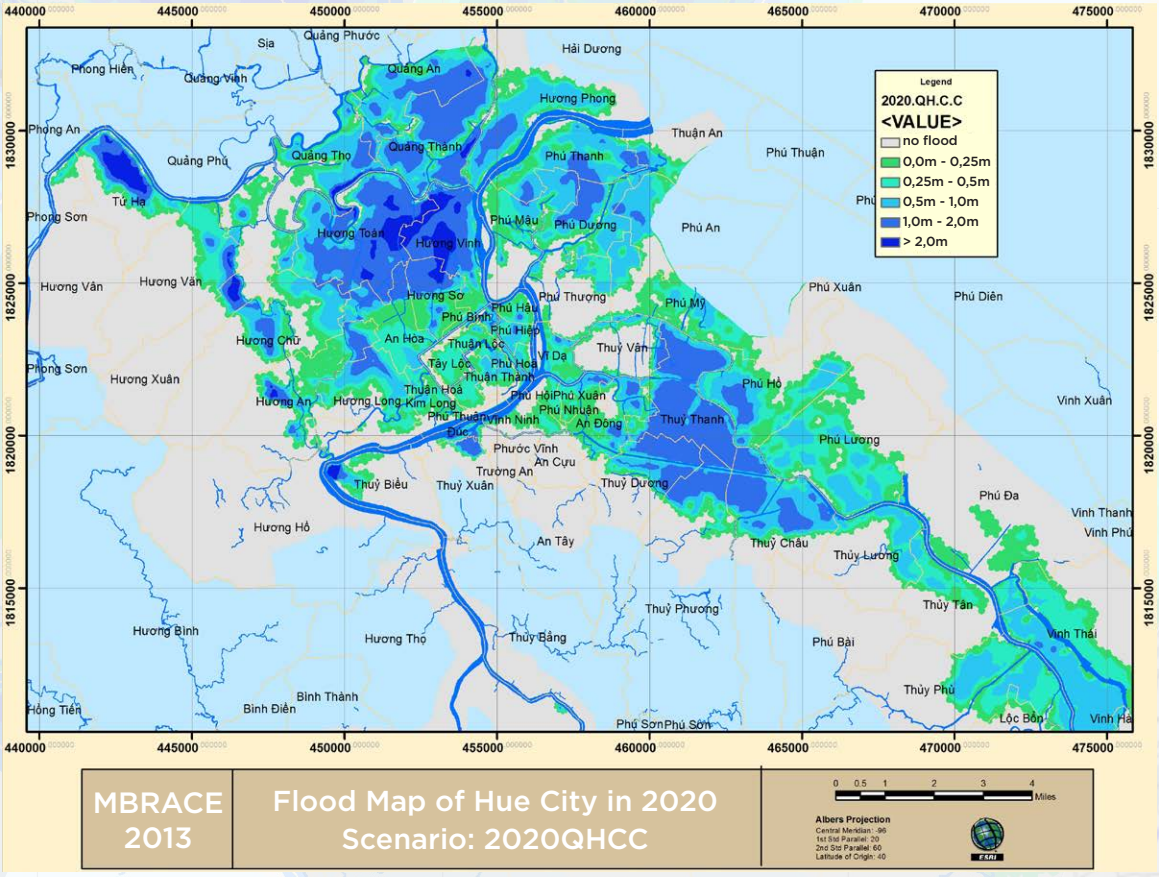
Hue is already experiencing climate change up to and beyond climate change projections. Monitoring in Hue has already shown evidence of rainfall and temperature increases that are in line with local climate projections. Weather monitoring data from the last decade has shown that overall annual precipitation rates have increased and there has been an increase in the intensity of individual storms compared to previous decades. At the same time, the dry season has seen more extended periods without rainfall. In fact, conditions of recent years in Hue have already surpassed climate projections developed by Vietnamese

government agencies (using IPCC Scenario B2). Hue's particular local geography—close to the ocean which brings typhoons and with mountains behind that funnel water into the flood-prone city—further contributes to more extreme climate events. The city can expect that climate change will continue, and given that climate in the city is already surpassing projections, there will be a need to consider a range of future possible climate scenarios.

Urbanization is changing the nature and intensity of flooding in ways that amplify and redistribute risk. Changing patterns of urbanization are amplifying and distributing risk in new ways and are influencing how people experience climate-related events. Due to the local geography—with mountains on one side of the city and the ocean on the other—urbanization in Hue faces especially acute constraints and challenges. As a result, land that is targeted for urban expansion lays either in low-lying floodplains on the outskirts of the city or along the exposed coastline. Land-raising and infilling is regularly used to create more land for development; however, as this raised land both reduces the area of the floodplain and is sometimes higher than previously developed land, this has shifted flood patterns and led to increases in flood levels and duration in different parts of the city. Urban development to the east of the city, directly on the coast, is highly exposed to climate events, including typhoons that regularly hit the city. A lack of coordination and enforcement around urban and project planning has led to compounding and reinforcing impacts; for example when in-filling from one-project redirects floodwaters to new areas. The City Master Plan that has been developed outlines urban development for the next fifty years, yet, while it seeks to create a more integrated vision for the city, it is built on minimum-risk assumptions of climate change and reservoir management and does not fully incorporate the possible risks the city faces.

New competing demands and climate change are requiring reservoir management practices that exceed the original reservoir design. A number of reservoirs have been built on the rivers in the upper watershed above Hue. These reservoirs were originally built to supply water for agriculture and for hydropower based on risk assessment informed by earlier climate patterns; however, urbanization has led to increased demands on these reservoirs, which now need to simultaneously provide water for urban and agricultural uses, release enough water for environmental protection, supply hydropower, and store water for flood protection. Reconciling these different needs will become increasingly difficult as precipitation patterns become less reliable, creating new sets of risks that were not considered in the original design of the dams. Recent instances where

Flood vulnerability map in Hue generated under scenario analysis project conducted in M-BRACE shows that many parts of the city, especially the center where many historical sites are located, face significant flood risks.



reservoirs have had to release water during flood periods because they were in danger of failing, suggest that reservoir management is a critical variable in understanding flooding in the city. Better reservoir management will require not just improved infrastructure, but also enhanced institutional capacity around forecasting, monitoring, and coordination, and the ability to deal with changing patterns of uncertainty and risk.

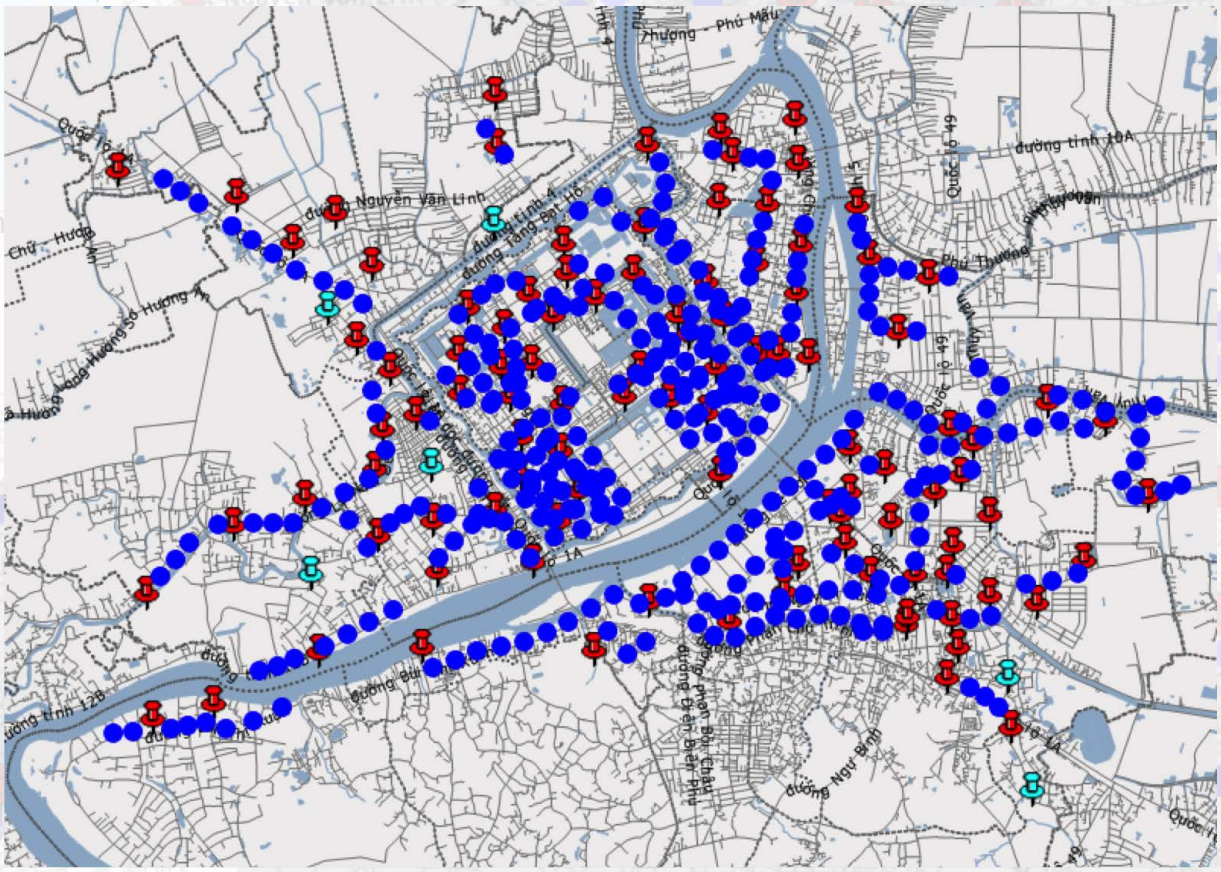
ACTIVITIES IN HUE

As part of M-BRACE, individual projects—activities targeted at building capacity or knowledge that will aid resilience—were conducted in Hue. Together, they represent diverse and complementary solutions that, when combined with others, lead to measurable improvements in the city. These projects targeted a range of issues and capacities, such as:

Generate, access, and use data and information to better understand floods.
As floods regularly impact the citizens of Hue, understanding how and when these floods develop is important. In Hue, a new community flood-monitoring system will allow residents to both provide information about flooding near them and to access information, via phones, text messaging, or computers, about flooding elsewhere in the city. This system not only allows for up-to-the-minute data to be made widely available, but it also provides a good source of historical flood data that can help the city better understand changing patterns of flood risk as the city expands.

Develop future scenarios and use them in decision-making processes.
Given the uncertainty around the future as a result of climate change and urbanization, bringing stakeholders together to develop scenarios of options and alternative futures can provide valuable inputs to public policy-making. In Hue, researchers worked to develop flood scenarios under a range of future urbanization, climate change, and reservoir management conditions. These scenarios were then integrated into a shared vision planning model, developed in partnership with the US Army Corps of Engineers, which will be used to inform decision-making around urban development and reservoir management in Hue.

Build knowledge and awareness of the risks of climate change.
While many people are aware of climate change, there is less understanding of the impacts that the city, communities, and individuals in Hue may face. Through a specific project that developed and distributed documentaries about Hue as well as throughout public and stakeholder meetings, M-BRACE helped to share and disseminate more information about the impacts of climate change on Hue.



Map of Hue city showing monitoring and reporting sites for new community-based flood monitoring system developed under M-BRACE

LOOKING TO THE FUTURE

As Hue looks beyond M-BRACE, it is well positioned to continue building resilience. A Climate Resilience Action Plan (CAP) was drafted by stakeholders in the city and approved by the Hue City People's Committee on 27 June 2014. The plan identifies twenty-four actions that the city of Hue can take to help build urban climate change resilience. These actions range from ones targeting agents and institutions, such as starting an awareness campaign to help build knowledge and capacity in some of Hue's most vulnerable communities, to those that target infrastructure and ecosystems, such as building a flood corridor in the city. For each of the twenty-four items, the draft Climate Action Plan identifies the goals, timeframe, priority areas and subjects, and implementation targets. The plan also identifies sources of funding, including from local, national, and external sources, other related and ongoing projects in the city, and the key stakeholders that will be involved in implementing each action. With the approval of the CAP, agencies and departments throughout the city will now work to integrate the items in the CAP into their own one-, five-, and fifteen-year plans. The CAP also positions Hue as a leader for Climate Resilience in Vietnam, an area that, most notably through the recent issuance of national directive on urban development and climate change[1], is emerging as a core area of focus.

1 Decision No: 2623/QĐ-TTg, 'Approval of Scheme "Urban Development of Vietnam Responding to Climate Change in the Period 2013 - 2020"'

M-BRACE is undertaken with the generous support of the American People through the United States Agency for International Development (USAID) in partnership with the Institute for Social and Environmental Transition (ISET), Thailand Environment Institute (TEI), and Vietnam National Institute for Science and Technology Policy and Strategy Studies (NISTPASS).

RESIDENTS OF HUE HURRY HOME BEFORE ANTICIPATED FLOODING BLOCKS KEY ROADS IN THE CITY
Photo Credit: Richard Friend