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City STRENGTH
RESILIENT CITIES PROGRAM

CAN THO, VIETNAM

Enhancing Urban Resilience

JUNE 2014

WORLD BANK GROUP

GFDRR
Global Facility for Disaster Reduction and Recovery

City STRENGTH
RESILIENT CITIES PROGRAM

THE RESILIENT CITIES PROGRAM was launched by the World Bank Group in December 2013 to help cities strengthen their ability to prepare for and adapt to changing conditions, and to withstand and recover rapidly from disruptions related to climate change, natural disasters, and other shocks and stresses. The Program serves as an umbrella for delivering the analysis, rationale, and support local governments need to make resilience part of their urban management agendas.

THE CITYSTRENGTH DIAGNOSTIC was developed as a means of engaging with cities on the complex issue of resilience by using a holistic approach to identifying priority actions and investments to strengthen urban systems. Designed to be implemented by sectoral specialists, the rapid diagnostic process draws upon ideas and data from a multitude of existing tools. A longer-term goal of CityStrength is to promote alignment in approaches to urban resilience to improve awareness of resilience considerations among local leaders and development partners. Financial and technical support for the development of the Diagnostic was provided by the Global Facility for Disaster Reduction and Recovery (GFDRR).

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Note to the Reader

Can Tho is a dynamically growing city that faces multiple threats to achieving its development goals—seasonal flooding, sea-level rise, potential land subsidence, and rapid urbanization. In June 2014, Can Tho invited a team of specialists from the World Bank Group to implement the CityStrength Diagnostic in close collaboration with local officials, technical staff, and stakeholders. The objective of this publication is to share the findings of the Diagnostic and the priority actions and investments agreed with local leaders.

Designed to be accessible to a broad audience, this publication presents the most relevant and actionable information that emerged from the diagnostic process. Although the implementation of CityStrength in Can Tho leveraged a substantial collection of studies, research, and plans prepared by multiple development partners, this publication does not go into detail on each. Where applicable, those studies are highlighted within this text and readers are invited to seek out the original files for more in-depth information (see Resources on Can Tho at the end of this publication).

CityStrength is an interview-based methodology; as such, a significant portion of the findings captured in this publication are based on statements made by local officials and stakeholders during the launch workshop that drew over 90 participants, some 30 individual and group interviews, and field visits. In some cases, especially those that are of a contestable nature, statements are attributed to specific departments or organizations in Can Tho.

Acknowledgements

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The World Bank team would like to acknowledge the participation of the Can Tho City government and civil society in implementing the CityStrength Diagnostic, including:

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Letter from the Chairman

Can Tho is the engine of growth of the Mekong Delta. With a concentration of industries, educational institutions, health facilities, and science and technology research organizations, we are poised to achieve our 2020 goal of becoming a modern city that contributes to the development of Vietnam and growth of the South East Asia region.

Given this important role, we need to ensure that we address the threats to our future success. We need to take proactive measures to deal with recurrent flooding, the pressures of rapid urbanization, and the anticipated impacts of climate change to ensure that we reap the benefits of economic growth in a safe, sustainable, and inclusive way. In short, we need to become more resilient.

Becoming more resilient will require strengthened urban management capacity and better coordination and sharing of information across departments. And it will also require continued investment in urban infrastructure like flood protection, transport, and sanitation. This will be a long-term journey, and the implementation of the World Bank's CityStrength Diagnostic represents just one milestone.

We are inviting the World Bank and other development organizations to join us in a long-term partnership to strengthen Can Tho and make it an even better place to live, work, and enjoy the natural beauty of the Mekong Delta.

Mr. Le Hung Dung

Chairman, Can Tho City People's Committee

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Executive Summary

Cities are vulnerable to many types of shocks and stresses, including natural hazards like storms and sea level rise, but also man-made ones like economic transformation and rapid urbanization. These shocks and stresses have the potential to bring city systems to a halt and reverse years of socio-economic development gains. Cities that are to grow and thrive in the future must take steps to address these shocks and stresses. Simply put, a resilient city is one that can adapt to these types of changing conditions and withstand shocks while still providing essential services to its residents. A resilient city can keep moving toward its long-term goals despite the challenges it meets along the way.

The residents of Can Tho are familiar with challenges—the city is dealing with chronic seasonal flooding, periodic flood disasters, riverbank erosion, saltwater intrusion, possible land subsidence, economic transition, and rapid urbanization. The city is also aware of challenges that lay on the horizon like sea level rise, a labor force that is unprepared for high-technology industry, and an urban population that expects high-quality urban infrastructure and services from its government. These challenges are interlinked—encroachment on canals and riverbeds increases flood risk, while flooding and rampant growth impacts the safety and quality of life in urban areas.

In June 2014, a team of specialists from the World Bank Group worked with stakeholders in Can Tho to identify the priority actions and investments that will enhance the city's resilience to these current and future challenges. They explored options to transform planned or aspirational projects into initiatives that will also enhance the city's resilience. As the socio-economic engine of the Mekong Delta, Can Tho plays multiple important roles in promoting the well-being of its residents and the regional population. For Can Tho, efforts to promote greater resilience must be closely aligned with its long-term goals of economic growth and modernization.

To identify the bundle of actions and investments needed to enhance resilience in Can Tho, the World Bank team used the new CityStrength Diagnostic Methodology, a qualitative, rapid diagnostic process that uses a combination of guided interviews, exercises, and review of existing studies to determine sectoral and cross-cutting recommendations. As the first pilot of the methodology, lessons learned with the Can Tho experience will inform the future use of CityStrength in Vietnam and around the world.

How can Can Tho Become More Resilient?

Can Tho has an opportunity to address the two primary threats to its socio-economic development goals—flooding and uncontrolled urbanization—by more proactively guiding urban growth to areas with lower flood risk, including the higher elevation areas near the heart of the city. Institutional- and policy-related changes need to be coupled with investments in flood prevention and protection, transport to improve connectivity in the city center, sanitation, and urban upgrading targeting poor and vulnerable groups. Transportation systems, for example are usually viewed narrowly for their ability to efficiently move goods and people. In the case of Can Tho, however, it is clear that transport decisions and investments are inextricably linked to the long-term economic and physical resilience of the city. This is the most important and "no regret" flood prevention measure Can Tho can take.

As a collection of initiatives, implemented by Can Tho with more effectively coordinated support from development partners, the following actions and investments could have a transformational impact on the resilience of the city.

Priority Actions

Strengthen institutional capacity and legislative frameworks for an effective integrated flood risk management approach. Resilience is not solely about the physical strength of protective infrastructure in a city; it also requires capacity to ensure its smooth delivery and operation. There is an urgent need to strengthen the institutional capacity of city authorities to ensure that effective coordination across various city departments and ministries and Mekong Delta provinces is put in place, adequate structural and non-structural measures for flood risk management are fully integrated in the city's urban planning processes, the operation and maintenance of the city flood control and drainage systems is consolidated, and an effective mechanism for citizen participation in flood risk management is established.

Enhance the collection, sharing, and use of data on public assets, buildings, population, and risks. Data is the foundation of effective resilience planning. This data is needed as the basis for planning growth in the city, and especially for the creation of detailed area plans. Beyond use for urban planning initiatives, the collection and sharing of information on the physical aspects of the city and hazard incidence is important for transport planning (which should be closely linked with land use plans), public asset management, quantifying damages and losses due to flooding, and local budgeting.

Improve the analysis of climate impacts in Can Tho by introducing standardized damage and loss assessment procedures that will enable local officials to quantify the impact of flooding on the local economy and budget. Hazard events potentially represent a significant explicit and implicit contingent liability of the government that is shouldered by a broad range of line items in the annual budget, as well as unseen lost economic activity. Can Tho has established a reserve fund

for unplanned contingencies; but additional analysis of the city's financial management, including growth of the reserve fund over time, and the city's full contingent liabilities are required to determine the adequacy of these measures for the city's risk profile.

Strengthen financial management to enhance the sustainability of infrastructure investments and strengthen capital investment planning to facilitate better prioritization, monitoring, and achievement of economic development goals. Resilient cities have a strong financial foundation that supports planning and investment activities. A greater focus on the results of budget allocations, rather than just the money spent, could improve the efficiency of expenditures and the quality of outcomes. Currently, the capital investment planning process in Can Tho takes place on an annual basis during the normal budget preparation. The criteria for selection include socioeconomic benefits, but there is also an opportunity to integrate resilience considerations into the decision-making process while also improving the transparency of resource allocation.

Priority Investments

Focus on implementing flood protection measures in the urban core to make it a more attractive and safe place to live and do business. The Flood Control Master Plan for the period 2013-2020 developed by the Ministry of Agriculture and Rural Development and approved by the Prime Minister in 2012 presents a solid foundation for taking targeted action, especially in regard to the proposed investments identified for Phases 1 and 2 of the Plan. Specifically, Phase 1 focuses on the urbanized area of Ninh Kieu and includes a ring dike, tidal sluice gate, pumping station, and improvements to the sewer and drainage system. Phase 2 focuses on Binh Thuy (northwest) and includes extension of the dike along the Hau River to the north and a new dike to protect rural areas.

Use transport investments to guide urban growth to higher elevation areas and meet the needs of a modernizing city. Transport plays a major role in inducing and guiding urbanization, and transport investments in Can Tho should be used to strengthen the role of the urban core as the locus of development and growth. With this objective in mind, priority investments in the transport sector could include: (i) a second bridge crossing at Quang Trung; (ii) upgrading and selective provision of new roads in the urban core, especially those that encourage a public transport spine like Tran Hoang Na; and (iii) strengthening of waterway transport, subject to the recommendations of a logistics study.

Invest in sanitation to protect public health and support the economic base of the city. The new Can Tho City Sanitation Plan focuses on urban drainage, wastewater collection and treatment, and solid waste management activities, as well as providing direction and guidance to improve environmental conditions in rural areas, industrial zones, handicraft villages, and medical institutions. Immediate attention should be given to resolving the temporary solid waste disposal situation at multiple sites in Can Tho due to the high risk that leachate from the solid waste will contaminate adjacent agricultural fields. Moreover, efforts should be taken to leverage the investment made in the new KfW-funded wastewater treatment facility by promoting private investment in household connections to the sewer. Unless individual buildings are connected to the sewer system, the treatment facility contributes little to thwarting environmental degradation in the city.

Continue to focus on urban upgrading as a means of addressing encroachment on drainage canals and targeting support to poor and vulnerable groups in the city. Addressing encroachment on canals and riverbeds remains a priority, especially in the urban core. Over the last decade, Can Tho has made great progress in upgrading low-income areas and improving the drainage system in the city. These activities should be scaled up to include the remaining canals in the urban core that have not been addressed. Moreover, there is an opportunity to promote social inclusion and long-term sustainability of the improvements through a more participatory approach with local communities, including ethnic minorities.

WHAT IS A RESILIENT CITY?

A resilient city can adapt to a variety of changing conditions and withstand shocks while still providing essential services to its residents.

With most of the global population and capital goods concentrated in urban areas, cities are key to social development and economic prosperity. They are drivers of national economic growth and innovation and act as cultural and creative centers. But urbanization also brings challenges. With a greater concentration of people, assets, and infrastructure in urban areas, an increasingly complex range of shocks and stresses can put in jeopardy human wellbeing and hard-won development gains.

Natural disasters like storms, droughts, and earthquakes are not the only risks that cities face. Cities are also vulnerable to economic downturns, crime and violence, public health epidemics, and even infrastructure failure. These shocks can have devastating effects, bringing some or all of an urban system to a halt, and possibly causing asset damage and loss of life. Acute shocks and chronic stresses can also have a deep and lasting impact on human development. Disaster losses are often linked with, or exacerbated by, poverty and vulnerability of the poor that stem from socio-economic and environmental imbalances.

Cities are complex systems; and, like all systems, a city depends on the smooth functioning of its constituent elements and the larger organization in which it is nested. A city's resilience is therefore affected by the resilience of those smaller and larger systems. Disruptions to the basic services they provide can have cascading impacts well beyond the city itself. The complexity of cities also makes resilience building especially challenging. Focusing on one policy goal, such as climate protection, without considering others can lead to undesirable outcomes. These decisions may come as explicit trade-offs, unintended consequences, or some combination of the two. Building a resilient city therefore requires a holistic, multi-sectoral, and flexible approach to urban development.

Characteristics of Resilience

Robustness

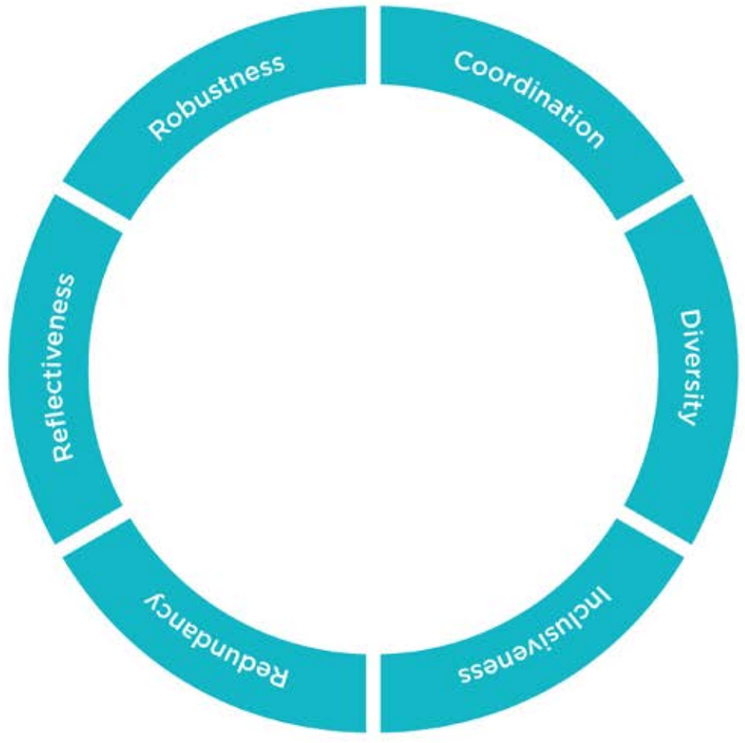
Robustness deals with the strength of the system, its reliability, and its ability to absorb and withstand disturbances. An important aspect of robustness is proper operations and maintenance to ensure that systems are functioning properly.

Reflectiveness

Resilient urban systems examine, learn, and evolve based on their past experiences and new information. Managing resilience requires regular assessment of the performance of systems and adjustment to changing circumstances.

Redundancy

Redundancy means that there are provisions for spare capacity or back-up systems that enable continuity of service or functionality in the event of a disturbance or increase in demand.



Coordination

Coordination between systems and agencies means that knowledge is shared, planning is collaborative and strategic, and responses are integrated for mutual benefit.

Diversity

Diversity means that services can be supplied in a number of ways, including using distributed resources or multifunctional equipment, with different exposures to hazards. If one service channel gets disrupted, another can be used. Spatial diversity – distributing assets across a city, or even beyond the city – may help ensure they are not all affected by a single geographical event such as a flood.

Inclusiveness

Consultation and engagement with a wide range of stakeholders, including the most vulnerable groups, ensures that systems are more resilient by considering a wider range of vulnerabilities, risk management capacities, and localized information. Equity in access to infrastructure and services underpins social cohesion and opportunity.

CityStrength Diagnostic Methodology

The CityStrength Diagnostic methodology facilitates a dialogue among stakeholders about risks in their city and the performance of urban systems. It helps identify priority actions or investments that will enhance the city's resilience as well as transform planned or aspirational projects into projects that will also help to build resilience. CityStrength stresses a holistic and integrated approach and encourages cross-sectoral collaborations to more efficiently tackle existing issues and to unlock opportunities within the city.

To cover topics within the city and metropolitan area purview, CityStrength Diagnostic modules include Community and Social Protection, Disaster Risk Management, Education, Energy, Environment, Health, Information and Communications Technology, Local Economy, Logistics, Municipal Finance, Sanitation and Solid Waste, Transport, Urban Development, and Water. These modules were created based on a review of about 40 tools and methodologies related to resilience and the analysis of over 600 indicators contained within them.

The CityStrength Diagnostic consists of 5 stages, book-ended by leadership commitment for resilience on the front-end and a longer-term engagement with development partners through financing or technical assistance at the back-end.

Stage One — PRE-DIAGNOSTIC DATA COLLECTION

The first stage focuses on collecting information and leveraging efforts that have already been undertaken in the city. A review of all relevant studies, reports, or plans developed by the city, the World Bank, or other development partners is conducted. Who prepared it? Why? And how was it used? Key finding are summarized in order to brief participants during the launch workshop as well as external specialists supporting the implementation of the Diagnostic. Specific background studies or data collection initiatives could also be undertaken during this stage depending on the context.

Stage Two — LAUNCH WORKSHOP

The second stage is a launch workshop. The objectives of the workshop are to inform all participants about planned activities, put the interests and priorities of different stakeholders into a holistic framework of urban resilience, demonstrate commitment by high-level government officials so that technical staff are fully engaged throughout the Diagnostic, and get confirmation on the city's priority areas.

Stage Three — INTERVIEWS AND FIELD VISITS

The third stage consists of interviews and field visits to help the external specialists better understand the challenges and opportunities in the city and to qualitatively measure how well key systems are performing in relation to the characteristics of resilience. It is also meant to give the city departments the opportunity to learn about each other's work programs and ongoing resilience activities. CityStrength has been designed with a modular structure so that it can be tailored to each city, targeting issues that are identified as priorities during the pre-diagnostic review and discussions with local government.

Stage Four — PRIORITIZATION

The fourth stage is the prioritization of actions and investments to enhance resilience in the city. This is done using multiple "lenses" to qualitatively identify measures that the participating specialists recommend as the most important for the city leaders to consider. While the ultimate goal of the CityStrength Diagnostic is to enhance the city's long-term resilience, it is important to understand the nature of any *immediate threats or vulnerabilities (Lens 1)*. It is also crucial to better comprehend the *direct and indirect effects (Lens 2)* of shocks and stresses in the city by examining interdependencies across key infrastructure systems and services. This aids in identifying measures that could be taken in one system that will deter problems in another. Identifying *cross-cutting issues (Lens 3)* can help to give priority to measures that maximize co-benefits. In Can Tho, the City Resilience Framework, developed by Arup International through a grant from the Rockefeller Foundation, was used for this purpose. Finally, aligning recommended actions and investments with *local goals and objectives (Lens 4)* increases the likelihood that the recommendations have sufficient stakeholder support to become a reality.

Stage Five — DEBRIEFING AND DISCUSSION

The fifth stage is a meeting with local leadership to present the findings of the Diagnostic, share recommendations, and agree on priorities and next steps. After agreeing on priorities and next steps, the team of specialists prepares a brief publication highlighting the findings of the CityStrength Diagnostic that can be used by the local government to facilitate communication with a broad set of internal and external stakeholders.

CAN THO CITY

About Can Tho City

With a population of 1.25 million, Can Tho is the largest city in the Mekong Delta and the fourth largest city in Vietnam. Can Tho City has been classified since 2009 as a first-class city, which is under the direct management of the central government. Geographically, Can Tho holds a key position in Vietnam and in the wider Mekong Delta Region — a region that has huge economic potential but at the same time is highly vulnerable to a number of shocks and stresses.

Can Tho City plays a major role in the socio-economic development of the Mekong Delta Region. The Can Tho development goals for 2020 and 2030 envision further expanding this role. The city promotes the economy, culture, science, and technology for the entire region. In the last ten years, Can Tho has shifted its economic focus from traditional agriculture to industry, trade, services, tourism, and agro-businesses. Can Tho is projected to become the regional hub for high-tech agro-industrial production and aquaculture, food processing, and export, thereby becoming a major actor in promoting food security in the Mekong Delta. Also a national and international traffic hub, Can Tho has an important function in the regional transportation system supporting regional connectivity as well as hosting crucial infrastructures benefitting the entire region such as telecommunications and power and water networks.

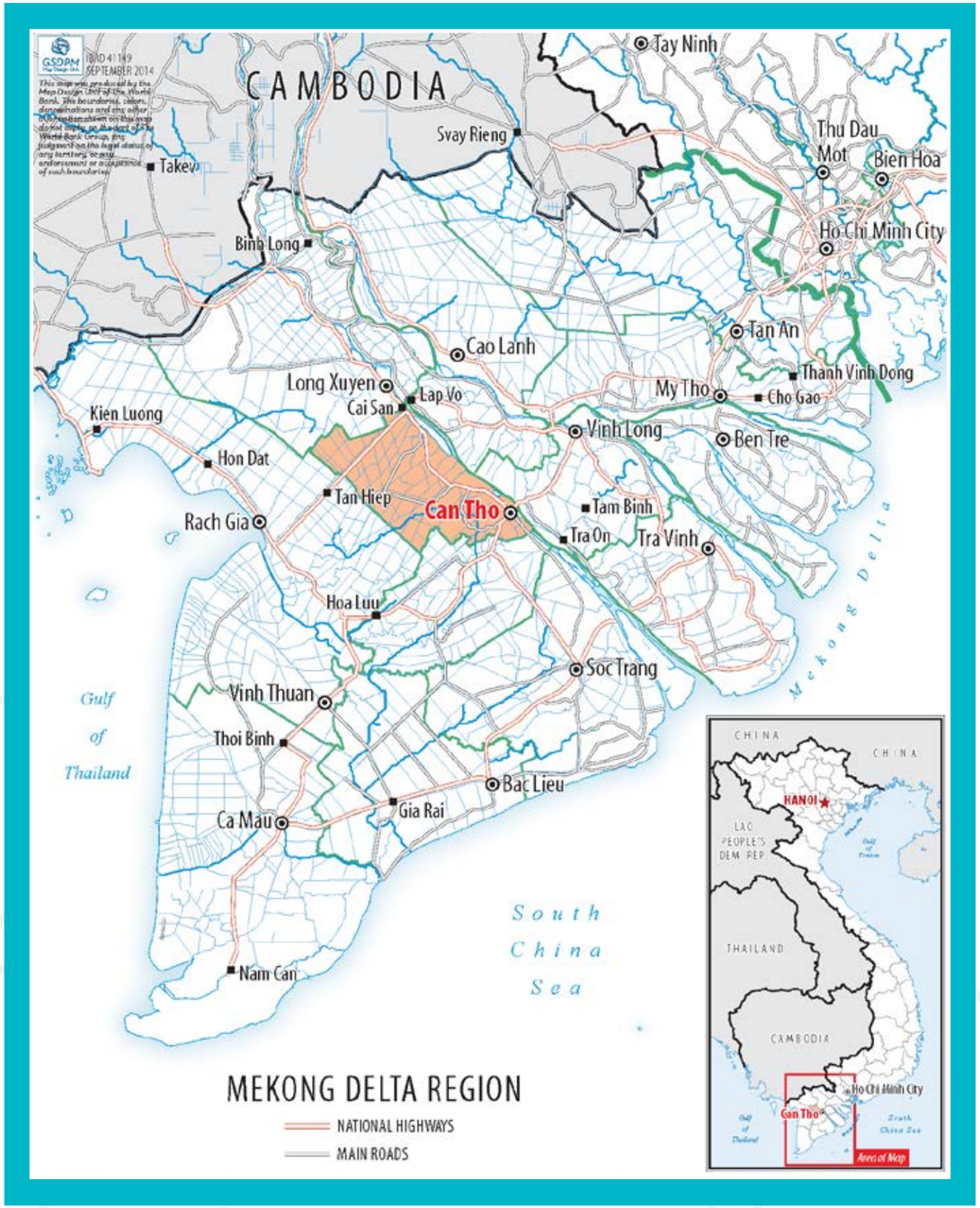
Because of Can Tho's important role in the Mekong Delta Region and the significant flooding challenges it faces, the city has been the focus of numerous studies, reports and activities carried out by both national and international agencies targeting key areas such as climate resilience, disaster risk management, transport, water and sanitation, and broader urban development. (Many of these studies and reports are listed at the end of this report).

Can Tho has taken important steps toward tackling present challenges by leveraging external support and local initiatives. To coordinate and mainstream climate change issues across departments, for example, a Climate Change Coordination Office (CCCO) was established directly under the Can Tho City People's Committee (CPC) with support from the Asian Cities Climate Change Resilience Network.[1] Can Tho has also established a Steering Committee for Flood and Storm Control (SCFSC) to lead and coordinate the implementation of a city-level action plan to implement the 2007 National Strategy for Natural Disaster Prevention, Mitigation, Preparedness, Emergency Response, and Recovery to 2020. To respond to the needs of a changing economy, 62 vocational training centers have been established to assist the existing workforce in transitioning into the new labor market. The encroachment of informal settlements on drainage canals in the center city is being addressed, and local capacity for urban upgrading is being strengthened (World Bank, 2009). And, the completion of the Can Tho Bridge and the international airport in 2011 represents a significant step in enhancing Can Tho's connectivity to the rest of the country and the world.

1 The Rockefeller Foundation supports a number of climate change management mechanisms and priority actions in the region through the Asian Cities Climate Change Resilience Network and ISET-International.

Can Tho's Socio-economic Development Plan 2020 and new Master Plan articulate a vision for the city's future:

- **Be a civilized and modern city known for its rivers**
- **Be the economic-social, educational-training, science and technology, medical, cultural, and sports center of the Mekong Delta**
- **Be the industrial center of the region, including high-tech industry, energy, engineering and electronics, processed agricultural and fishery products**
- **Be an important link in regional and transnational transport**
- **Contribute to the socio-economic development of the country and growth of the South East Asia region**
- **Create a comprehensive, balanced, and sustainable city**
- **Ensure national security and defense**



QUICK FACTS

Population
1.25 million

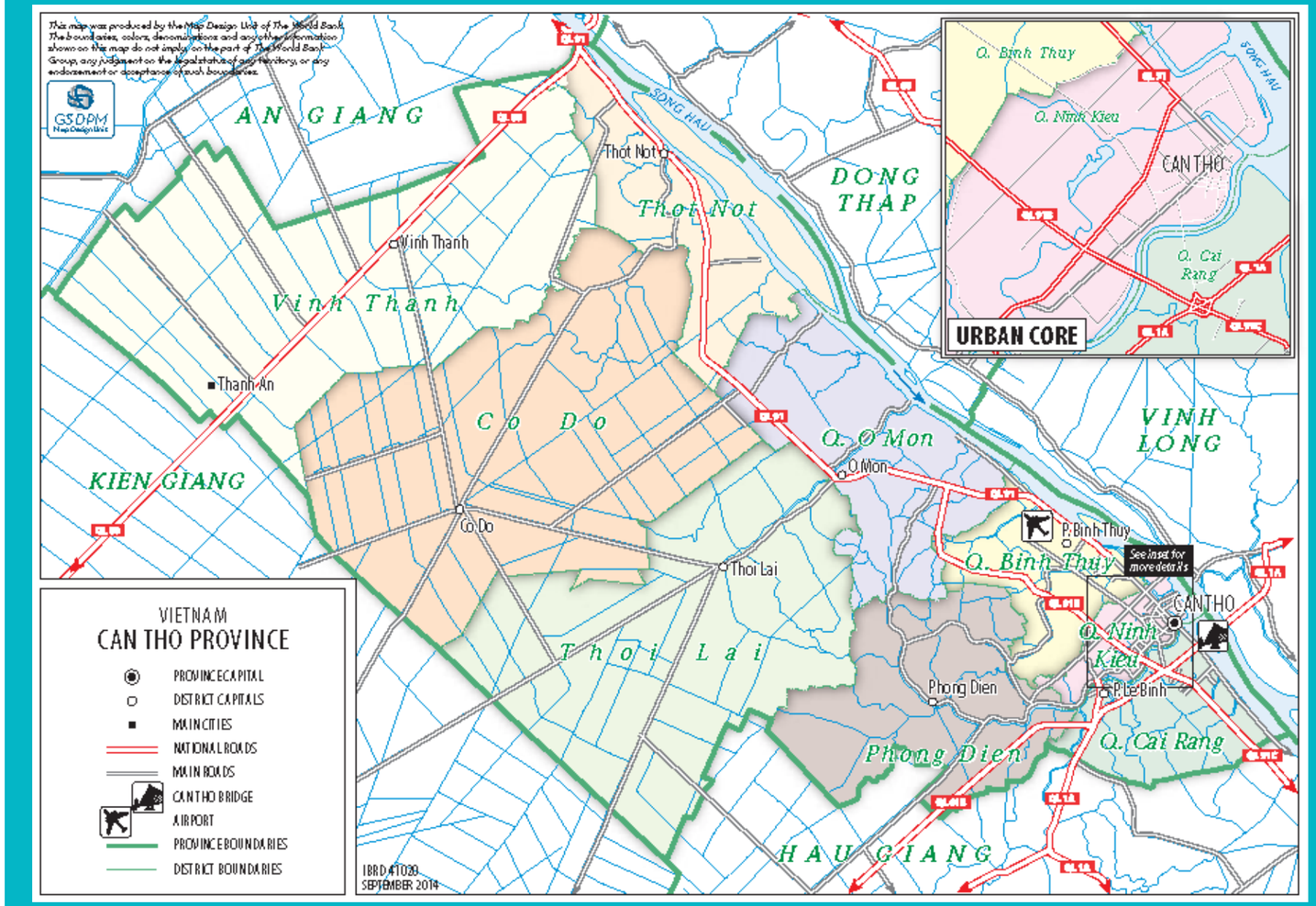
Population Growth Rate
9.7% [3]

Land Area
1,390 km2

Urban
66% (2011) [2]

Sources:
2 canthopromotion.vn
3 Vietnam Statistical Office
4 World Bank (2013c)
5 cantho.gov.vn
6 Can Tho City CPC (2014)
7 NIURP (2007)
8 cantho.gov.vn
9 Can Tho City CPC (2010)

CAN THO PROVINCE MAP



BASIC SERVICES

Access to Electricity
98% (2005) [7]

Urban Access to Piped Water
62% (2005) [7]

Rural Access to Piped Water
80% (2005) [7]

Access to Piped Sewers
only residents in Ninh Kieu district [8]

Solid Waste Collection
only urban core

LOCAL ECONOMY

Poverty Rate
11.7% (2013) [4]

Unemployment Rate
4.7% (2011) [5]

GDP Growth
11.67% (2013) [6]

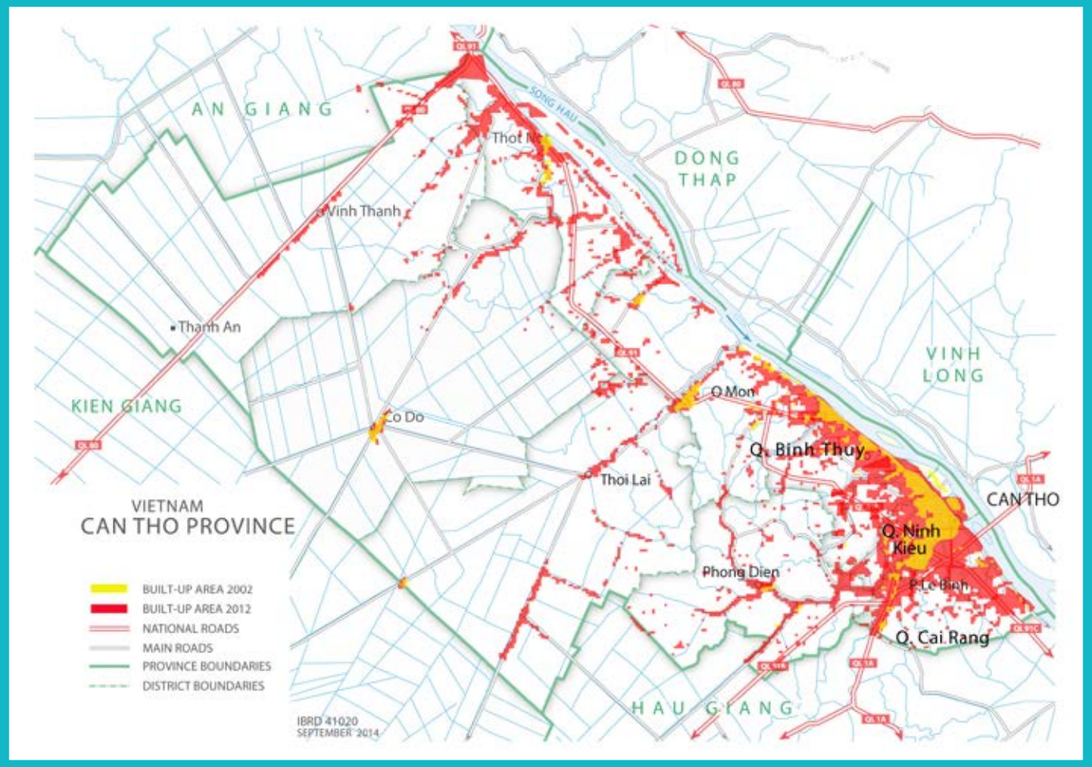
CLIMATE

Average Annual Rainfall
1,600-2,000 mm

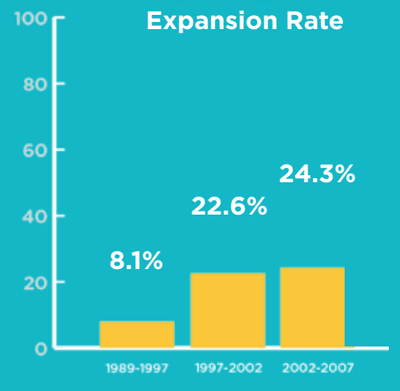
Average Land Elevation
0.8 - 1 m
above sea level

Predicted Sea Level Rise
1m by 2100
in the East Sea [9]

URBANIZATION

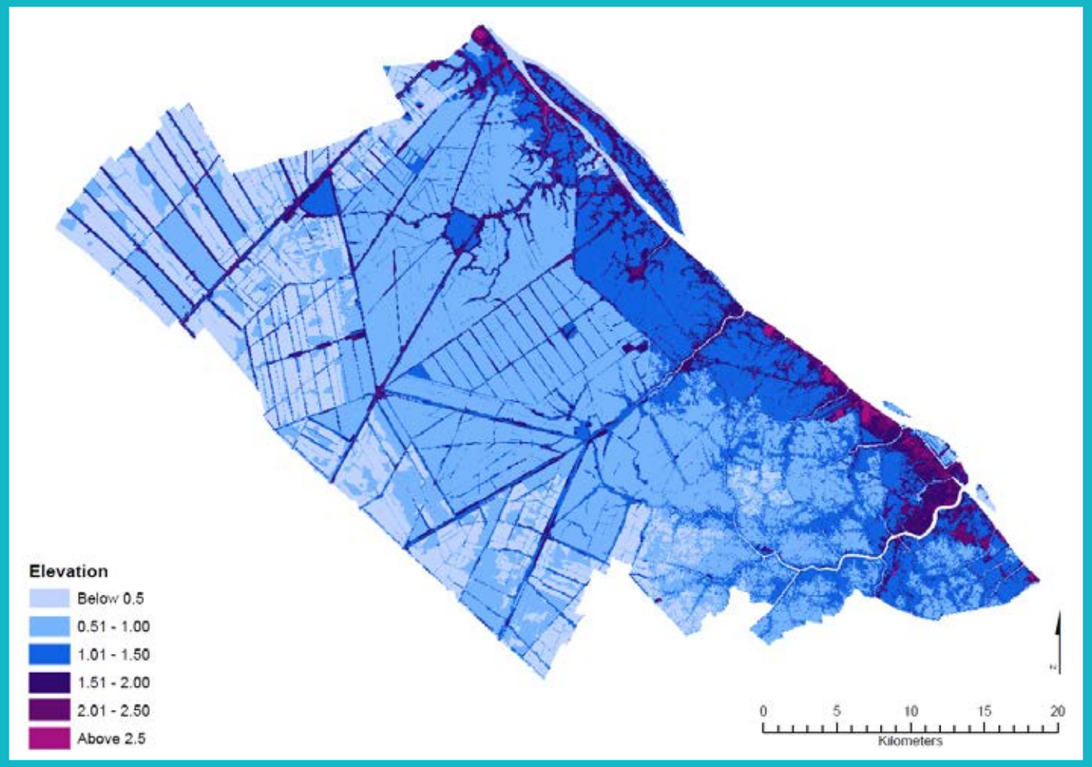


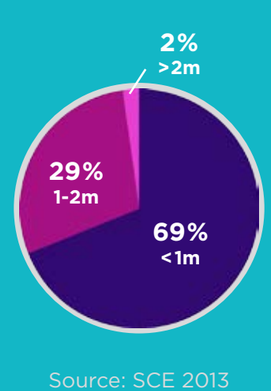
Adapted from Mai Thy, P. T. et al (2010)



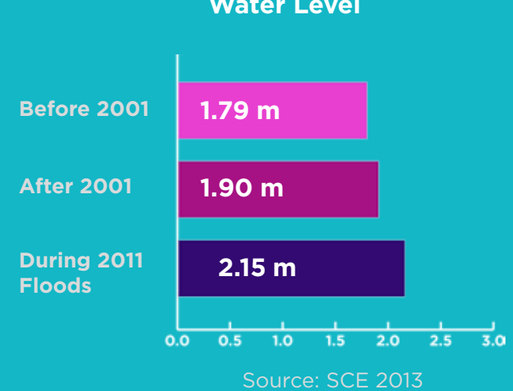
Maximum Density
7,000 people/km2
in Ninh Kieu

TOPOGRAPHY AND FLOODING





Source: SCE 2013



Source: SCE 2013

Key Challenges

Flooding and uncontrolled urbanization are the two main threats to the resilience of Can Tho, and they are closely linked. Encroachment by low-income households on canals and river beds increases flood risk, while flooding and rampant growth impacts the safety, value, and quality of life in urban areas. In addition, chronic flooding may undermine confidence in the urban core (primarily Ninh Kieu) as a viable location for living and doing business.

Land subsidence is a potential threat to Can Tho's long-term resilience, a challenge that requires further study. A recent study sponsored by the Dutch Government to support a Mekong Delta Plan showed that land subsidence due to sustained, long-term drainage and groundwater extraction is occurring in the region. Can Tho authorities strongly believe that land subsidence is also threatening their city and, combined with sea-level rise, could lead to worsened seasonal flooding. The relationship among water supply, groundwater extraction, land subsidence, and flood protection is not well understood in Can Tho.

The poor are especially vulnerable to natural hazards and changing economic conditions. Living by canals in poorly constructed housing, the urban poor are disproportionally exposed to flooding, storms, and other harsh weather impacts. Moreover, the elderly, children, disabled people and other vulnerable groups are at higher risk due to limited access to protective public services. The poor in Can Tho tend to depend on rice and fish for sustenance and as a source of employment. As the city shifts away from a traditional agricultural base toward a high-tech agriculture and modern export industry, there is a looming mismatch between the labor force and skills required for new industries.

The impacts of flooding in Can Tho are being underestimated. Flooding from heavy rains and high tides is a chronic stress that the city has learned to cope with and considers a "way of life". Technical staff in Can Tho have high capacity and a desire to shift the paradigm from coping with flooding to reducing flooding and its associated risks. However, they are not able to quantify the full impact of the problem. Although many risk assessments have been conducted in Can Tho, the impacts of flooding on the local economy and household income are not well understood. Unlike acute shock events that generate high levels of damage, seasonal flooding primarily generates other types of economic losses related to business discontinuity, delays in the transport of goods, inaccessibility to jobs, and indirect health impacts. Quantifying both damages and losses can help Can Tho to better articulate the impacts from flooding, to prioritize and demonstrate the need for protective infrastructure investments, and to understand the potential impact these events could have on local finances.

Uncontrolled urbanization, coupled with insufficient sanitation infrastructure, presents a growing risk of environmental degradation and adverse health impacts. A combined storm water and sewer system, lack of wastewater treatment, and direct discharge of household sewage into rivers and canals facilitate the circulation of human waste through the streets and into homes during re-current flooding events. This has direct health impact, especially for extremely low-income households that also source their drinking and bathing water from polluted waterways (Moglia et al, 2013). Moreover, temporary, unlined landfills in the city present an imminent threat to adjacent agricultural fields when it rains or floods. These sanitation issues could have significant indirect impacts on the economic attractiveness of the city, especially for agro-industries, as leachate (runoff) from a landfill could contaminate crops grown on adjacent fields with dangerous chemical compounds (specialist observation during field visit).

Data collection and sharing is needed to improve the quality and responsiveness of physical and financial planning in Can Tho. Information related to urban growth, public assets, and flood events is not collected on a systematic basis, nor is the data saved in a digital format that would facilitate analysis for decision-making and sharing across departments. For example, a census of structures is carried out on a regular basis, but it is not geographically referenced. This limits the utility of this information in tracking urban growth and monitoring development in environmentally sensitive areas. Moreover, many of the detailed neighborhood plans that provide guidance on infrastructure development are paper-based, which also makes the city's process and enforcement of construction permitting less transparent and effective (interview with DOC). With regard to current and future flood risk, a sophisticated flood model (based on Mike 11, a diverse, river modeling package) has been developed for the Mekong Basin, including Can Tho. There is also a fairly precise, digitalized, elevation model available. All simulation results and maps are contained in a project atlas and are available in Geographic Information System (GIS) format (SCE, 2013). However, the extent to which this risk information has been integrated into infrastructure planning and budgeting taking place in city line departments is limited.

A lack of coordination among departments, other government entities, and donor agencies may be limiting the effectiveness of resilience-building efforts. Multidisciplinary issues like climate change, disaster risk reduction or emergency response require coordination across multiple government departments and areas of expertise. For this precise reason, Can Tho established the Climate Change Coordination Office (CCCO) and the Steering Committee for Flood and Storm Control (SCFSC). However, there is a lack of clarity between the two entities in terms of responsibilities and mandate; it is difficult to effectively draw together initiatives from the many city line departments or at higher levels of government into a collective action plan for Can Tho. There is also a need for improved coordination in operating the city's drainage and flood control systems, which is partly managed by the Department of Transport (DOT) and in part by the Department of Agriculture and Rural Development (DARD). Each sector largely continues to plan and implement activities independently (interview with CCCO). This represents a missed opportunity to seize upon cross-cutting issues that could enhance Can Tho's resilience. Moreover, as evidenced by the many studies, plans, and technical assistance activities in Can Tho, donor agencies are bringing support to the city. Some of this support, however, fails to build upon existing bodies of work or are not sufficiently connected to downstream implementation processes, resulting in an inefficient use of human and financial resources.

FINDINGS OF THE CITYSTRENGTH DIAGNOSTIC

During the CityStrength Diagnostic process, sectoral specialists developed a snapshot of the performance of urban systems in Can Tho in relation to the characteristics of resilience. Better understanding of the strengths and weaknesses within each of the systems served as an input to the overall prioritization process. The following pages provide an overview of the key resilience characteristics for each sector in Can Tho.

URBAN PLANNING AND DEVELOPMENT

In a resilient city, physical and socio-economic planning processes are well-coordinated, inclusive, and cross-sectoral. Key stakeholders are involved to align plans with sector priorities and to ensure that the interests of all societal groups are taken into consideration. Coordination between departments and other agencies enables the use of existing knowledge and data across the city to better understand current and future vulnerabilities. Urban planning and development ensures a holistic and long-term approach to urban growth, factoring in potential shocks and stresses and encouraging proactive mitigation measures.

In Can Tho, rapid urbanization, in combination with seasonal flooding, presents a key challenge to urban development (ISET, 2010; Huong and Pathirana, 2013). The city is unable to respond fast enough to a rapidly growing population and lags behind in providing basic services to its residents, especially those living in less-urbanized areas (Moglia et al., 2012). Knowledge about the speed and nature of urbanization is limited due to a lack of data on informal growth (interview with DOLISA). Encroachment on canals and riverbeds is threatening the city's ecosystem by clogging its natural drainage mechanisms and is posing additional health hazards to populations that are already vulnerable to flooding and canal/ riverbank erosion (Challenge to Change et al., 2009). The city is gradually re-settling informal populations from the exposed areas and is proactively directing

urban growth into lower-risk zones (interview with CPC; Can Tho Master Plan, 2013).

Can Tho has a transparent and inclusive urban planning process in place that includes formal consultations with different levels of government, expert groups, and local communities (interview with DOC). The city's overall development vision is supported in the city's spatial plans as evidenced by the alignment of Can Tho's Socio-economic Development Plan 2020 with the new Master Plan 2030. Coordination and knowledge sharing between departments is somewhat weak as evidenced by limited reflection on each other's programs and activities in sectoral plans.

DEVELOPMENT PARTNER ACTIVITIES:

Type	Title	Sponsor	Partners	Primary Government Counterpart	Time Period
Strategy Document	City Development Strategy for Can Tho	Cities Alliance	National Institute for Urban and Rural Planning; World Bank	Ministry of Construction	2012
Infrastructure Project	Mekong Delta Region Urban Upgrading Project	World Bank		Can Tho City People's Committee	Approved 2012
Infrastructure Project	Vietnam Urban Upgrading Project Additional Financing	World Bank		Can Tho City People's Committee	Approved 2009
Infrastructure Project	Vietnam Urban Upgrading Project	World Bank		Can Tho City People's Committee	Approved 2004

Resilience Characteristics

Robustness

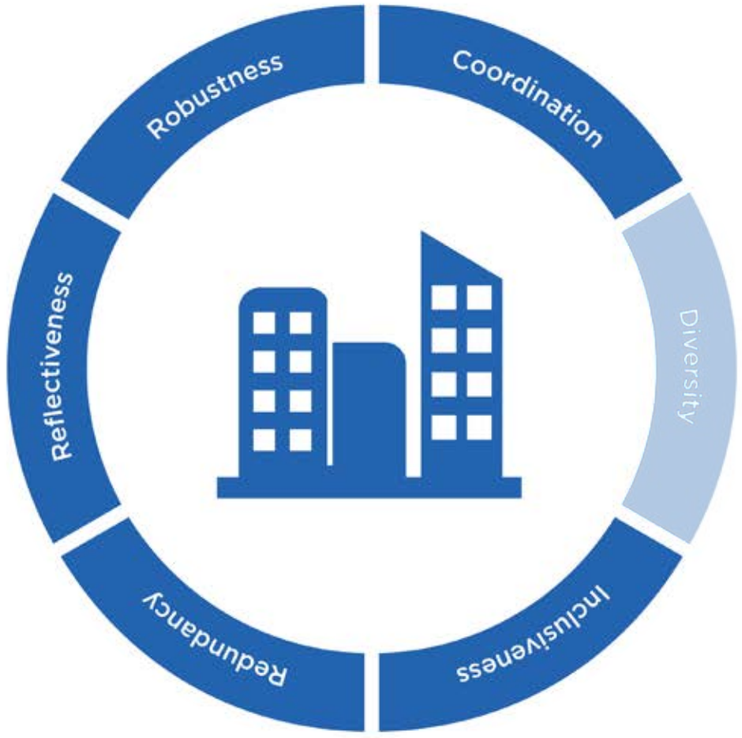
The city's building codes cover multiple types of assets and reflect flood risk to some degree. All projects are required to adhere to these codes in order to receive building permits. However, a challenge in Can Tho is the large presence of dilapidated houses that are not built according to code (Carrard et al., 2012). In addition, uncontrolled urbanization is posing a threat to the city's ecosystem and to people's health as a result of untreated wastewater discharge (interview with DONRE; Loan, 2010). Urban upgrading activities aimed at improving the living conditions of informal settlers and simultaneously improving the city's ecosystem by clearing natural drainage canals are ongoing but insufficient in coverage (interview with CPC).

Reflectiveness

The city monitors changes in natural hazards and is trying to direct urban growth into lower-risk areas (interview with DONRE). Although the city is aware of the environmental and human safety risks associated with informal growth along roads and canals and in peri-urban areas, there is no formal strategy for accommodating future in-migration of lower-income groups elsewhere in the city. Moreover, the collection of data on the building stock and public assets are not digitized or geo-referenced (interview with DOC), making it difficult to measure urbanization trends as well as damages and losses caused by flooding and other hazards.

Redundancy

Given that the city's actual rate of population growth is unknown (interview with DOLISA), it is difficult to evaluate whether land designated to urban development will meet future demand. It appears that there is insufficient supply of affordable formal housing as demonstrated by the presence of informal settlements along the city's waterways and roads (field observations). Lack of service coverage to all segments of the population indicates that Can Tho is unable to absorb the rapidly growing population (Moglia et al., 2012; interviews with DOT and DOC).



Coordination

In Can Tho, the socio-economic development vision is successfully integrated into the city's spatial strategy. Sectoral plans are consequently developed in line with the general framework laid out in the Master Plan (interview with DOC). However, there is limited coordination among the various sector-specific plans. Efficient implementation of the Master Plan would require more explicit delegation of responsibilities and stronger participation for line departments in the preparation of detailed area plans (SCE, 2013).

Inclusiveness

Can Tho has established transparent and predictable procedures for consultation on urban plans. Planning processes generally include a number of platforms for communicating the draft plan and receiving feedback from the public (interview with DOC). Informal groups, however, are systematically overlooked in the city's socio-economic and spatial planning by being excluded in population estimates that lay the foundation of such planning.

MUNICIPAL FINANCE

A resilient municipal finance system is able to withstand large-scale shocks to revenues or unforeseen needed expenditures through reserving and flexible budget reallocation mechanisms. Budget planning, management, and policy-making are based on actual performance data, including information on damage and loss from previous shocks or stresses. A resilient city has a municipal finance system that has sufficient autonomy to manage its resources and coordinates across departments to ensure spending leads to results for the city's priorities. It creates a stable and informed investment environment that allows for the involvement of diverse actors and supports an inclusive approach to budgeting, ensuring that the allocation of city resources reflects community priorities.

Can Tho has relatively diversified own-source revenue generation. Nonetheless, the city's ability to control its revenues and plan for its expenditures is limited given that the central government appears to require given percentages or levels of the city's operating budget be spent on specific sectoral areas (interview with DOF). There is also a gap between the priorities of its five-year master plan and the budget allocation. This is coupled with weak, medium-term, financial and strategic budget planning. Although the current level of budget provisioning and reserving appears to cover annual losses from flooding as established from past experiences, more severe disaster events, which could occur infrequently and outside the scope of historical analysis, could challenge the city's stand-alone fiscal profile.

Resilience Characteristics

Reflectiveness

The city's structure of expenditures is straightforward, but officials from the Department of Finance (DOF) and Department of Planning and Investment (DPI) have difficulty considering future trends in resource availability or different agencies' operating and capital needs, beyond what is required by national mandates. This reduces the general ability and incentive for city officials to engage in a thoughtful, scenario-based, multi-year planning process.

As noted in the DRM/CCA section, Can Tho is not able to collect or use clear information on its contingent liabilities resulting from disaster and climate risks. While the city uses its annual contingency budget to soften shocks and stresses, city agencies appear to use a substantial portion of their annual budgets toward coping and repairing small-scale damage, which is not well captured.

More broadly, there is a gap between the priorities laid out in the city's five-year master plan and the amount of financial resources available and allocated to them. In addition, the municipal finance system, including budgeting processes, does not appear to draw on performance-based principles, making it difficult for the city to cost-effectively maintain and manage public-owned assets.

Robustness

For the last ten years, own-source revenues appear to be rising in line with GDP and population growth (10-year budget data provided by DOF). Also, given that Can Tho appears to be a net-revenue contributor to the central government, it seems unlikely that the current debt will become unaffordable. The city's current provisioning and reserving is able to cover recent losses experienced from annual flooding. However, in the event of a severe disaster, Can Tho could suffer from decreased tax revenues and increased expenditures needed for recovery. The city's assets are not covered by insurance (SCE, 2013), and additional development in Vietnam's insurance market would likely be required in order for appropriate and well-priced coverage to become available to the city. In addition, Can Tho has a limited ability to financially and strategically plan for the medium to long term as its financial decision-making is currently based on one-year budgeting.

Redundancy

Per national requirement, the city has a reserve fund and puts aside 3-5 percent of annual recurrent expenditures for unplanned contingencies. The annual contingency line item is drawn down frequently, but the reserve fund has never been used (interviews with DOF and DPI). It can only be utilized upon approval of the People's Committee and carries other restrictions on its use, potentially weakening the city's capacity to act quickly and effectively in the event of serious shocks and emergencies.

DISASTER RISK MANAGEMENT AND CLIMATE

A resilient city has a disaster risk management system that combines a well-functioning and inclusive disaster preparedness and emergency response mechanism with effective disaster prevention infrastructure. Such a mechanism and infrastructure is based on an integrated citywide risk assessment and is developed to prepare for, limit, and recover from expected natural hazards. In a resilient city disaster risk management is integrated in all city-planning processes, including master land use, socio-economic, and sectoral plans. A resilient city bases its decisions for budget allocation and investment prioritization on information that includes experienced and expected damages and losses from disaster events.

Flooding in Can Tho is a result of rainfall and poor drainage in combination with a high tide and river level. Land subsidence, if occurring in the city, may exacerbate the seasonal flooding problem (SCE, 2013). In the past, Can Tho has also suffered from riverbank erosion, salt intrusion, and typhoon (very uncommon). To address disaster risks and climate change impacts, Can Tho has formulated a number of legislative frameworks, policies, and action plans, including a city-level action plan for implementing the National Strategy for Natural Disaster Preparedness, Prevention, Mitigation, Emergency Response, and Recovery to 2020 and the Can Tho City Climate Change Resilience Plan 2010-2015 (Can Tho CPC, 2010). In addition to these action plans, the World Bank supported an integrated flood risk management plan (SCE, 2013) and the Ministry of Agriculture and Rural

Development (MARD) has prepared a flood control system master plan for the city.

In general, flood risk in Can Tho is well understood and several risk assessments have been conducted, albeit by external agencies (e.g., Challenge to Change et al., 2009; World Bank, 2012).

In addition to these action plans, the World Bank supported an integrated flood risk management plan (SCE, 2013) and the Ministry of Agriculture and Rural Development (MARD) has prepared a flood control system master plan for the city. In general, flood risk in Can Tho is well understood and several risk assessments have been conducted, albeit by external agencies (e.g., Challenge to Change et al., 2009; World Bank, 2012).

There is a well-functioning institutional structure in place for disaster emergency preparedness and response, including an early warning system under the guidance and supervision of the Steering Committee for Flood and Storm Control (SCFSC) under DARD. However, risk reduction infrastructure is delivered and maintained by multiple actors—DARD, Department of Natural Resources and Environment (DONRE), Department of Construction (DOC), and DOT—who are not well coordinated. DOT is in charge of the piped drainage system and part of the open canal system in the city while DARD manages all the open canals in agricultural areas and the flood control system. DONRE is responsible for water resource management. And, DOC administers the building codes for drainage systems and building permits for buildings and infrastructure that may impact underground drainage pipes. These three aspects of the city's flood control system are not managed in a consolidated manner (SCE, 2013).

Can Tho has put substantial effort into improving and upgrading the city flood control and drainage systems, including levees, tidal sluicegates, sewer systems, and canal dredging (SCE, 2013). However, the fragmented nature of the investments and financial resource constraints have resulted in a flood protection system that has proven inadequate for addressing the flood challenge (interviews with CCCO, DARD, and SCFSC). Moreover, slow onset flooding has become a way of life in Can Tho and is generally not perceived as a disaster event (SCE, 2013). As such, attention has not been put on quantifying the damage and loss that this seasonal flooding causes. This is needed in order to inform budget planning and to prioritize infrastructure projects. Can Tho needs to move from a flood response approach to a proactive, integrated, and multi-sectoral approach to disaster risk management.

DEVELOPMENT PARTNER ACTIVITIES

Type	Title	Sponsor	Partners	Primary Government Counterpart	Time
Technical Assistance	Developing and Implementing Real-time Salinity Monitoring, Dissemination and Response Mechanisms	ACCCRN	ISET	Centre for Environment and Natural Resources Monitoring of Can Tho City; CCCO	2012 - 2014
Strategy Document	Integrated Flood Risk Management Plan for Can Tho	World Bank	SCE	Can Tho City People's Committee	2013
Strategy Document	Mekong Delta Plan: long-term vision and strategy for a safe, prosperous and sustainable delta	Government of the Netherlands	Royal Haskoning, Wageningen University, Deltares	MONRE, MARD	2013
Technical Assistance	Climate Change Impact and Adaptation Study for the Lower Mekong Basin	USAID	ICEM, DAI		2013
Technical Assistance	Climate Change Impact and Adaptation Study in the Mekong Delta	ADB, AusAID , Climate Change Fund		MONRE	2010-2012
Technical Assistance	Climate Change Resilience Coordination Office	ACCCRN	ISET	Can Tho CPC	2010 - 2012
Technical Assistance	Strengthening institutional capacity for Disaster Risk Management in Viet Nam, including climate change-related disasters	UNDP	Red Cross and Hanoi Water Resources University	MARD; Can Tho CPC	2008-2011
Strategy Document	Climate Change Resilience Action Plan of Can Tho City, 2010 – 2015	ACCCRN	ISET, CTC, World Bank, MONRE, NISTPASS, SIWRR, CTU	SCCC and DONRE	2010
Technical Assistance	Hazard, Capacity & Vulnerability Assessment in relation to Climate Change	ACCCRN	CTC, The Dragon Insitute, The Mekong Rice Institute, CTU	DONRE	2009
Strategy Document	Local Resilience Action Plan	World Bank; GFDRR		Can Tho CPC	2009
Technical Assistance	Can Tho City Steering Committee on Climate Change (SCCC)	World Bank (SCCC established as part of MOU with Bank)		Can Tho CPC	2009

Resilience Characteristics

Robustness

The flood events in 2011 and 2012 demonstrated that existing flood infrastructure, including the retaining walls and concrete quays in the urban districts, are inadequate to deal with the seasonal flood challenge in Can Tho. In terms of emergency preparedness, there is an early warning system providing timely information through local media channels.

Reflectiveness

Physical and financial damage assessments are carried out after disaster events to inform decision-making (SCE, 2013). However, the expected financial losses from flood events are not systematically accounted for and are, therefore, largely underestimated. This has led to insufficient knowledge about costs of past events, lack of direct budget allocation for risk reduction activities, and no understanding of the contingent budget liability associated with disaster loss.

Redundancy

A climate-shocks emergency preparedness plan is available and updated annually. This city plan is consolidated from the departments, districts and major state companies emergency plans. Flood prevention measures are limited to elevated roads and pavements that act as local dikes, small soil levees along drainage and irrigation systems, and a few retaining walls and concrete quays in the central districts. Current flood protection systems have little spare capacity to deal with changing or worst-case scenario floods. The existing dike system has limited capacity in preventing inundation of the urban core and is currently focusing on dike rings to support winter rice crops (SCE, 2013). The current road embankments are not sufficient to prevent inundation of the urban core. As part of a large urban upgrading project in the city center, several clogged canals have been cleaned and reopened for drainage purposes (World Bank, 2009). Most of them have been designed in a low-level, flood mitigation standards. Additional flood prevention measures, such as tidal sluice gates, are lacking (SCE, 2013). Green structure solutions such as temporary urban storage areas, pervious pavements, and infiltration trenches could be an opportunity for the city.

Coordination

The institutional set-up for disaster risk management and climate change adaptation is complex, with overlapping roles and responsibilities. There are two entities with a mandate to coordinate and mainstream flooding issues—the Climate Change Coordination Office (CCCO) and the Steering Committee for Flood and Storm Control (SCFSC)—and there are three departments involved in the design, operation, and maintenance of the drainage and flood control systems. Specifically, the DOT manages the piped drainage system and part of the open canal system in the city. DARD (under which the SCFSC is located) manages open canals with an agricultural drainage purpose as well as the flood control system, including dikes and tidal gates. DONRE is responsible for water resource management. And, DOC is responsible for issuing building codes for drainage systems without managing and operating them. There is a need to consider these structures as part of one flood management with one consolidated operations and maintenance procedure.

Legislation and planning for flood risk management is also somewhat uncoordinated. For example, Can Tho has an action plan for the implementation of the national DRM strategy as well as a climate change adaptation (CCA) plan. Portions of the latter, especially in regard to climate change adaptation, overlap in an inconsistent way with the existing DRM action plan. Similarly, the DOC provides standards for designing the drainage system without coordinating with DARD standards for designing the flood control system (SCE, 2013).

Coordination among the provinces of the Mekong Delta Region is also extremely important. Encroachment taking place in the upstream provinces has caused the flooding problem in Can Tho to become more severe (interview with ISET). Moreover, while coordination during planning is needed, the execution of the plan in a coordinated manner is equally important. The central government should play a key role in providing clear guidance and incentives to ensure that all ministerial and provincial development plans in the Mekong Delta are developed and implemented in a collaborative and coordinated manner.

Inclusiveness

Decisions concerning investments and budget allocations for major infrastructure development are taken at the national level, thereby potentially excluding local agencies from influencing the priorities for disaster risk financing. Stakeholders, including communities and partners, were not fully consulted on most of the city investments for flood control and drainage systems since the investment plans are developed sectorally. Locally, there are no financial mechanisms for sharing risks such as insurance companies (SCE, 2013).

COMMUNITY AND SOCIAL PROTECTION

In a resilient city, residents, including vulnerable groups, are given equal and fair access to basic services. Support structures, such as safety net programs, target all vulnerable segments of the society and effectively deliver their services under any given scenario. All residents have equal opportunity to engage in the formal economy and have sufficient capacity to deal with and bounce back from shocks and stresses. Decision-making and planning is inclusive and reflects community priorities and needs. A resilient city creates opportunities for a thriving civil society that supports the fair representation of society.

Most people in Can Tho have access to basic services such as electricity, schooling, and healthcare (Can Tho CPC, 2014). The main challenge is unequal access to safe water and sanitation services (Moglia et al., 2013). Poverty levels are moderate and annually decreasing (Carrard et al., 2012), although the extent to which migrant workers and informal settlement residents are captured in these statistics is uncertain (interview with DOLISA). The largest ethnic group, the Khmer, has a poverty rate three times higher than that of the Kinh people. While the poor live in the most vulnerable areas, poor households do not prioritize disaster risk as they have more pressing, basic problems related to health and livelihoods. A government decree on grassroots democracy has meant that information about development plans is adequately disseminated to communities (interview with DOLISA). However, meaningful community engagement in high-

level decision-making is still lacking, as exemplified by the absence of community participation in citywide planning (interview with DOC). Communities are fairly well organized for disaster preparedness and response at the commune level but could be more engaged on aspects of risk identification and risk reduction. Women fully participate in the formal economy and hold decision-making positions, both in the workplace and in the household (interviews with DOH and DOLISA).

DEVELOPMENT PARTNER ACTIVITIES

Type	Title	Sponsor	Partners	Government Counterpart or Implementation Agency	Time Period
Technical Assistance	Strengthening Dengue Fever Surveillance and Response System	ACCCRN	ISET-Vietnam	Preventive Health Center of Can Tho City	2012 – 2014
Technical Assistance	Vietnam Youth Urban Resilience Competition	ACCCRN	Challenge to Change	Provincial/City Youth Union; Climate Change Coordination Office	2011 – 2013
Study	Survey on Perception of Risks in Can Tho City	GFDRR	Global Network of Civil Society for Disaster Risk Reduction	CCCO	2011
Study	The Social Dimensions of Adaptation to Climate Change in Vietnam	World Bank	Centre for Natural Resources and Environmental Studies (CRES); Vietnam National University; Dragon Institute; Challenge to Change		2010

Resilience Characteristics

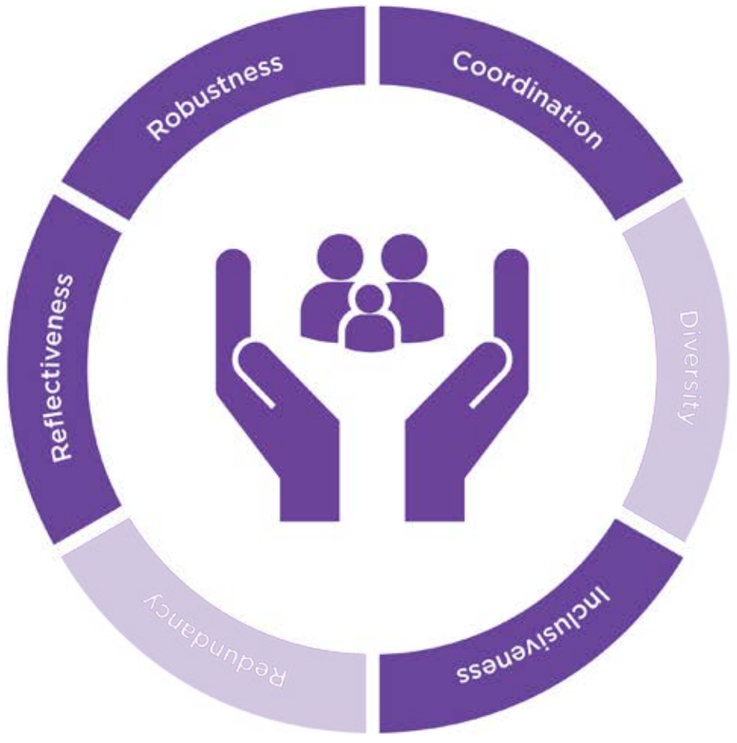
Robustness

Can Tho has a diverse set of safety net programs that cover needs of groups such as ethnic minorities, the poor, the elderly, orphans and the disabled. The programs focus on poverty reduction and disaster reconstruction and compensation. Yet, despite the numerous safety net programs, poor populations continue to be disproportionally affected by natural hazards through damages to housing and loss of livelihoods. In addition, rapid urbanization is negatively impacting the urban poor due to lack of basic services and increasing exposure to environmental pollution (Challenge to Change et al., 2009).

Reflectiveness

Affected communities have learned from previous stresses and have, over time, developed several disaster risk management strategies. These include shifting their livelihoods from agriculture to aquaculture and elevating roads to reduce mobility disruptions during the flood season (field observations and interviews with PC representatives of rural districts).

The city's poverty reduction strategies are informed by regular monitoring of poverty trends (interview with DOLISA). However, it is uncertain to what extent the city's poverty data adequately reflect the presence and conditions of migrant groups and informal settlements.



Coordination

Several city departments are responsible for managing a fragmented set of safety net programs, including the Department of Labor, War Invalids, and Social Affairs (DOLISA) for poverty reduction, Committee for Ethnic minorities for social inclusion, and Department of Agriculture and Rural Development for livelihood support to farmers. However, there is limited coordination between these programs (interviews with DOH, DOLISA and DARD).

Inclusiveness

Can Tho is inclusive in its provision to some basic services, including electricity, schooling, and healthcare, but struggles with providing universal access to safe water and sanitation services, especially among the poor.

With a higher poverty rate, ethnic minorities are a high-priority target group for poverty reduction safety net programs (interview with DOLISA). Different community groups are represented by mass organizations such as the Women's Union, People with Disabilities' Association, and Farmers' Association.

Communities are also included in disaster preparedness activities and response planning, and receive emergency response training by organizations such as the Red Cross (interviews with civil society and DPC representatives). However, communities are less involved in the design of citywide risk reduction strategies (interviews with CCCO and DARD). The existing disaster risk management (DRM) plans, for example, were developed without consulting with communities, including those living along the canals. The active participation of families, local authorities, and local communities in risk assessments, design of works, and implementation and monitoring of activities can help reduce the impact of seasonal flooding as well as future climate impacts. When disaster preparedness and mitigation works are not options, the feasibility of preventative resettlement depends on the active participation of communities at risk.

ENERGY

A resilient energy system offers a secure supply of power that ensures the continuity of services in the event of disruptions. It has spare capacity to provide power to the city under any circumstances, especially to ensure continuity to the functioning of critical infrastructure like hospitals and government buildings. The planning for and design of energy infrastructure is informed by an integrated risk assessment taking major shocks and stresses into consideration. A resilient energy system provides access to electricity to all societal groups. Management of the energy system, including decisions regarding distribution and pricing, is inclusive of local departments and stakeholders.

Planning for and management of energy issues are done at the national level, limiting the participation of Can Tho stakeholders. The diverse national energy portfolio provides the city with several alternatives for supplying electricity. Within Can Tho there are two diesel-fired power plants currently used as "peakers" that can supply electricity to critical infrastructure, such as government buildings and hospitals, during shortfalls and outages. For additional electricity generation, the construction of a gas power plant is under way in Can Tho. When completed, the O Mon Power Centre, supported by the ADB and KfW, could result in the city exporting power to the entire Mekong Delta Region (JICA, 2012; SCE, 2013). The flood risk in Can Tho appears to have informed prevention measures for the energy sector such as providing concrete poles for distribution wires and elevating transformers (field visit to Unit 1 of O Mon 1 Plant).

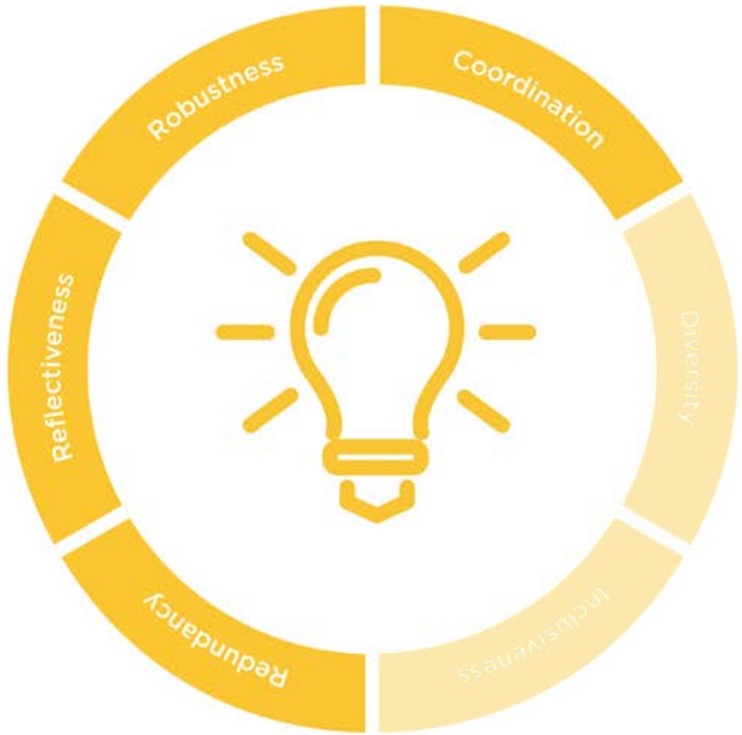
Resilience Characteristics

Robustness

Vietnam has a diverse energy portfolio, including hydro, coal, gas, and oil, providing the city with several alternatives for its electricity supply. Independent, back-up generation capacity has been installed in hospitals. The energy supply could potentially be subject to disruption from Chinese imports or from the reduction in hydropower during droughts. However, Can Tho's fuel supply is relatively robust since the city is a major fuel distribution site. In addition, once a new natural gas line delivering gas to the city is completed, the two existing power stations will come online full-time with two additional plants scheduled to be constructed, which could result in the city exporting power to the entire Mekong Delta Region. The probability of price shock is relatively low since energy prices are tightly controlled. Load shedding does occur during emergencies and during energy shortfalls, but there is currently no demand-response market to formally integrate load shedding into the supply market.

Reflectiveness

The flood risk in Can Tho appears to have informed the design of local energy facilities such as providing concrete poles for distribution wires and elevating transformers (field observations). In addition, most existing power stations are located at slightly higher elevations and there is reportedly guidance and building codes calling for the elevation of electric outlets and equipment in buildings (interview with DOC).



Coordination

Can Tho has limited influence over energy planning since these decisions, including importing, generation, transmission, distribution, allocation and retailing, are centrally coordinated by the state-owned energy company (interview with CPC).

Redundancy

Can Tho is primarily reliant on imported power from other provinces as well as from neighboring countries. However, the city's two diesel-fired power stations, that are normally only used as "peaker" plants, do have sufficient generation capacity to meet the majority of city demand should the imported power be disrupted. Key facilities including hospitals are prioritized to receive power during such shortfalls (interviews with DPI).

TRANSPORTATION

A resilient transport system offers multiple modes of transport to its users to ensure the continuity of mobility in the event of disruptions and to ensure access to transportation for all population groups. It takes a flexible approach and proactive coordination with other agencies to be able to divert user traffic to different modes of transport based on changing conditions. In a resilient city, the planning for and investments in the transport sector are based on holistic risk assessments and are closely aligned with other departmental plans and overall key priorities of the city.

In Can Tho, transportation planning is integrated into the city's urban planning practices (interview with DOC). Although the city has proactively assessed transport investments based on flood risks (interview with DOT), it is unclear whether the effectiveness of investments has been evaluated according to the city's key priorities. Moreover, the link between transport investment and city development patterns is not fully taken into consideration. Transport infrastructure is predominantly dependent on roads, rendering the transport sector vulnerable to disruptions caused by seasonal flooding. Can Tho has no alternative strategy for commuting or logistics during the flood season.

Upgrading of roads has taken place across Can Tho to tackle the flood risk by elevating roads and implementing built-in drainage systems; however, this

has been limited to national and provincial roads (SCE, 2013). Can Tho has a monoculture of motorcycles that is posing a threat to air quality and impairs the mobility of certain vulnerable groups (field observations and interview with AOPD). To this end there are plans to further strengthen the existing public bus transport system (interview with DOT). The waterways are currently underutilized and could play a bigger role for goods and passenger traffic.

DEVELOPMENT PARTNER ACTIVITIES:

Type	Title	Sponsor	Partners	Primary Government Counterpart	Time Period
Infrastructure Project	Central Mekong Delta Region Connectivity Project	ADB; AusAID; Export-Import Bank of Korea		Ministry of Transport	Approved 2013
Technical Assistance	Trung Luong-My Thuan Can Tho Expressway	ADB		Viet Nam Expressway Corporation	Proposed
Infrastructure Project	Can Tho Bridge	JICA		Ministry of Transport	2010

Resilience Characteristics

Robustness

Can Tho has not made strategic investments in mobility and logistics to realize the full potential of the road and waterway systems and thereby better withstand seasonal pressures. The city is proactively responding to traffic changes by strengthening its bus-based, public transportation network; although, the current public transportation operates at a financial loss for the city. Transportation infrastructure is primarily financed by the city with no mechanism for road cost-recovery, with the national government only providing capital for national transport assets and matters of national policy network (interview with DOT).

Reflectiveness

Transportation investments are based on lessons from previous flooding impacts and expected flooding levels (interview with DOT). Although Can Tho has proactively assessed transport investments based on flooding risks, it is unclear whether the effectiveness of these investments has been evaluated according to key priorities for the city.

Redundancy

There is a lack of an alternative strategy for commuting and freight transportation during the flood season. With the majority of roads under water during flooding events and with a transport infrastructure almost entirely dependent on roads, it severely impairs the mobility of both freight and passengers. However, key roads are being elevated to improve accessibility throughout the year (SCE, 2013; interview with DOT).

Coordination

Can Tho demonstrates a well-functioning and flexible cooperation between the Ministry of Transport and the Department of Transport for the planning and management of transport infrastructure. Transportation planning is integrated into the city's urban planning practices as confirmed by the city's coherent master plan.

Diversity

The observed transport mode is predominantly made up of motorcycles. However, there are plans to diversify mobility options by further strengthening bus-based public transportation. Waterways are generally under-utilized. River transport is used for some goods and raw materials whereas public transportation is limited to ferries for river crossing (interview with DOT).

Inclusiveness

The dominant use of motorcycle transport limits the mobility of certain vulnerable population groups such as the elderly and physically disabled (interview with CPC and AOPD). However, the bus-based public transport system is substantially subsidized, which benefits the poor and immobile.

WATER AND SANITATION

A resilient sanitation system provides inclusive access to sanitation services. It takes a holistic planning approach that takes social, economic, and environmental risks and vulnerabilities into account. Planning for and investment in the sanitation system is driven by demand and supply data, and is based on cross-departmental collaborations that support coordination with existing urban development plans and priorities. In a resilient city there is sufficient human and technical capacity to ensure sustainable operation, maintenance and financial management of sanitation infrastructure and services.

Until recently, Can Tho lacked a coordinating body for sanitation activities, resulting in limited cross-departmental collaboration; the City Environmental Sanitation Coordinating Committee was established to serve this purpose and implement the City Sanitation Development Plan (Can Tho CPC, 2013). Poor financial management of sanitation infrastructure in combination with insufficient capital investments (interviews with DPI and DOC), which mainly comes from the state budget, has led to a lack of financial sustainability for the sanitation sector. This has resulted in the under-development of sanitation infrastructure systems including drainage, wastewater collection and treatment, and solid waste disposal (Can Tho CPC, 2013). There is no treatment of domestic or industrial wastewater, for example, and facilities for domestic and medical solid waste management are limited (interview with DOH; SCE, 2013); “a large

number of industries and households are known to release wastewater directly into waterways" (Neumann et al., 2013). The first wastewater treatment plant in Can Tho is being constructed. It is expected to be completed in 2014 and will have a 30,000 cubic-meter per day capacity.

There appears to be a lack of technical and managerial capacity related to overall management, planning, and operations and maintenance of sanitation infrastructure (Moglia et al., 2013). The current state of sanitation causes serious damages to peoples' health and impacts the economy through, for example, lost navigational functions of the waterways and reduced quality and output of aquaculture products. Can Tho has recently approved a City Sanitation Development Plan under the proposed national Unified Sanitation Sector Strategy and Action Plan (Can Tho CPC, 2013).

DEVELOPMENT PARTNER ACTIVITIES:

Type	Title	Sponsor	Partners	Primary Government Counterpart	Time Period
Technical Assistance	Capacity Building for the Management, Planning and Coordination of the Sanitation Sector at Subnational Level in Vietnam	Water and Sanitation Program; World Bank		Can Tho CPC/ City Sanitation Committee	2014-2016
Infrastructure Project	Water Supply Improvement Program	JICA			Pipeline
Infrastructure Project	Sewerage and Wastewater Disposal Project	KfW	GIZ		2008-2014
Technical Assistance	Wastewater and Solid Waste Management in Provincial Centers	GIZ		Ministry of Construction	2005-2014
Technical Assistance	AKIZ Vietnamese-German Joint Research Program on Integrated Wastewater Concept for Industrial Zones (IZ Tra Noc)	KfW	German Federal Ministry of Education and Research	Ministry of Science and Technology	2010-2014
Technical Assistance	Poverty Dimensions of Water, Sanitation And Climate Vulnerability in Can Tho City	AusAID	CSIRO; CTU	Can Tho Water Supply and Sewerage Company	2012
Technical Assistance	Cost-effectiveness Analysis as a Methodology to Compare Sanitation Options in Peri-urban Can Tho, Vietnam	AusAID			2010

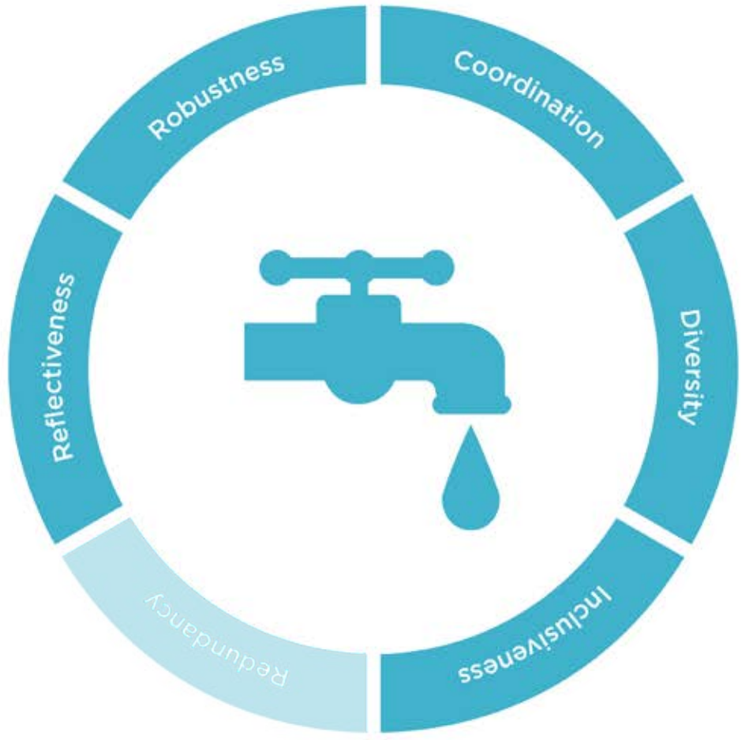
Resilience Characteristics

Robustness

Lack of implementation of sanitation regulations; lack of treatment facilitates; and poor management, including operations and maintenance of existing facilities, has meant that many industries and households release wastewater directly into waterways. In addition, there is no treatment of industrial waste, and solid waste management facilities have limited capacity (interview with DOH; SCE, 2013). Projects focused on drainage and wastewater treatment are encountering difficulties in attracting investment funds. Poor financial management of sanitation infrastructure has led to a lack of financial sustainability due to the existing system of low-cost recovery and setting of low caps on sanitation charges/fees.

Reflectiveness

There is limited consideration of how the lack of sanitation infrastructure and management affects both public health, with regard to water-borne diseases for example; and economic prospects, with regard to the marketability of agricultural products for example. There is also a limited understanding about the linkages between inadequate sanitation, flooding, and associated social and environmental impacts.



Coordination

The City Environmental Sanitation Coordinating Committee has only recently been established to coordinate sanitation activities within the city government. In addition, the relationship between the government and the existing utilities appears to be weak. With the recently approved City Sanitation Development Plan, the DOC in collaboration with DPI and DOF will now play a leading role in coordinating sanitation infrastructure and services (Can Tho CPC, 2013).

Diversity

With limited access to sanitation services and generally inadequate sanitation infrastructure, there are few alternatives available other than to discharge untreated wastewater directly into the river and canal systems (Moglia et al., 2013). The first wastewater treatment plant in Can Tho is being constructed, with an expected completion in 2014 and a 30,000 cubic-meter-per-day capacity (interview with CPC). Can Tho does not have a sanitary landfill. Waste is currently collected and brought to several small, temporary landfills where it is buried (visit to landfill sites; interview with DOC).

Inclusiveness

There is no participation of civil society and user groups under the current sanitation management arrangements (Can Tho CPC, 2013). There is a need to expand the sanitation services to include all districts and end users in Can Tho, including informal settlers. Currently, solid waste collection is only provided in urban districts. Households and commercial users are charged a fixed fee for the service. The new wastewater treatment facility will only serve the Ninh Kieu district (interviews with DOC and CPC).

Priority Actions and Investments

There is an opportunity to address the two primary threats in Can Tho—flooding and uncontrolled urbanization—by more proactively guiding urban growth to areas with lower flood risk, including the higher elevation areas near the urban core. This approach is well aligned with the recently approved Master Plan (Can Tho CPC, 2013), especially its objective of creating a more consolidated urban area.

Enhancing resilience requires actions and investments that are oriented toward preventing flooding and strengthening the city center. The identified actions refer to institutional and policy-related changes, whereas the proposed investments refer to infrastructure-related development. Recommended actions need to be coupled with investments in flood prevention and protection, transport to improve connectivity in the city center, sanitation, and urban upgrading targeting poor and vulnerable groups. As a collection of initiatives, implemented by Can Tho with more effectively coordinated support from development partners, these actions and investments could have a transformational impact on the resilience of the city.

The successful execution of the recommended bundle of actions and investments requires significant coordination among departments and stakeholders in Can Tho as well as between Can Tho and higher levels of government. Some departments, such as transport, appear to have a cooperative relationship with the respective ministry, while other departments do not. Success also necessitates improved coordination among donor agencies and other international organizations that are active in the city. This is due both to the significant scale of resources needed, and to the linkages and interdependencies inherent in building a resilient city. Focusing the collective efforts of Can Tho government and development partners in a strategic way can facilitate better results and more efficient use of resources.

Priority Actions

Better manage urban growth and direct it toward higher elevation areas. This is the most important and "no regret" flood prevention measure Can Tho can take. This can be accomplished by taking proactive measures to incentivize or induce growth in the urban core through needed investments in transport, sanitation, and urban upgrading as well as targeted flood protection infrastructure. There is still ample development capacity in Ninh Kieu, Binh Thuy, and Cai Rang to accommodate projected population growth. As part of this urban development, it will be paramount to both continue current urban upgrading efforts and also proactively create space for lower-income groups in order to reduce future risk of informality in peri-urban areas and on canals. Retroactive measures to address encroachment and sprawl are far more financially and socially costly than taking proactive actions to include the poor in future development plans. Improved urban growth management in Can Tho will require capacity building as well as upgraded technology and software systems. It will also require significant coordination among departments outside the DOC.

Enhance institutional capacity and legislative frameworks for an effective integrated flood risk management approach. There is currently an overlap between the Committee for Flood and Storm Control (CFSC) and the Climate Change Coordination Office (CCCO). In addition, a number of city agencies are involved in the operation and management of flood-related infrastructure—the Department of Transport is responsible for urban water drainage and wastewater interventions, the Department of Agriculture and Rural Development is in-charge of flood control and agricultural drainage management, and the Department of Natural Resources and Environment is in charge of water resources management. This complex institutional set-up makes it challenging to effectively plan for and implement flood risk management interventions in Can Tho. The new DRM Law, adopted by the National Assembly in June 2013, stipulates that a single agency should be responsible for drainage, sewage, and flood control. Flood risk management also requires close coordination with Mekong Delta provinces, particularly the upstream provinces of An Giang, Dong Thap, Kien Giang, and Vinh Long. Therefore, there is an urgent need to strengthen the institutional capacity of city authorities to ensure that (a) an effective coordination across various city departments and ministries and Mekong Delta provinces is put in place; (b) adequate interventions, including structural and non-structural measures for the flood risk management and climate resilience, are fully integrated in the city's urban planning processes; (c) a consolidated operation and maintenance of the city flood control and drainage systems is implemented; and (d) an effective mechanism for citizen participation in flood risk management is established.

Enhance the collection, sharing, and use of data on public assets, buildings, population, and risks. This data is needed as the basis for planning growth in the city, and especially for the creation of detailed area plans. The recently approved Master Plan outlines the general growth trajectory and major land uses for the city, but detailed area plans provide the level of specificity needed for actual infrastructure design and construction, as well as the issuance of building permits. Currently, only about 50 percent of the city has completed detailed area plans. This is in part due to a lack of input information. Beyond use for urban planning initiatives, the collection and sharing of information on the physical aspects of the city and hazard incidence is important for transport planning (which should be closely linked with land use plans), public asset management, quantifying damages and losses due to flooding, and local budgeting.

In terms of technology, a priority action includes establishing a GIS-based system to facilitate updating and sharing of data. The ability to flexibly update and change plans based on new information is a key characteristic of resilience. Moreover, the process for collecting data is an opportunity to enhance inclusiveness, another characteristic of resilient city development. With this in mind, the collection of the physical data points and mapping could be done in partnership with Can Tho University and other partners through the Open Data for Resilience Initiative (OpenDRI), which works with governments to collate existing data using open source software. The World Bank has created OpenDRI and similar platforms in Bangladesh, Haiti, Indonesia, Nepal, and Sri Lanka. OpenDRI can also promote social inclusion by engaging local communities to collect data and build maps that describe the exposure of the built environment and the vulnerability of different groups to natural hazards and other risks. The CCCO could act as a possible home for risk-related databases. It is worth considering how these efforts can be harmonized with other efforts by the city to improve the documentation of public assets.

Create standardized damage and loss assessment procedures that will enable local officials to quantify the impact of flooding on the local economy and budget. Hazard events potentially represent a significant explicit and implicit contingent liability to the government, which is shouldered by a variety of line items in the annual budget as well as unseen lost economic activity. According to the DOF, after a disaster, Can Tho may be responsible for paying farmers compensation for lost crops,

providing compensation to repair damages, and performing infrastructure repairs, among other expenses – all of which may draw on different parts of the budget and are not captured clearly year to year. Per national regulation, Can Tho sets aside approximately 3-5 percent of recurrent expenditures as annual budget provisions and has established a reserve fund for unplanned contingencies, which as of June 2014 had a balance of approximately 11 percent of overall annual revenues. This annual provisioning practice, which the city has frequently used to cover annual needs, and the existence of the reserve fund, which the city has never used, appear potentially quite useful for coping with hazards that the city has faced and supporting the city's robustness to shocks and stresses. However, additional analysis on the city's financial management, including growth of the reserve fund over time, and the city's full contingent liabilities would be required to determine the adequacy of these measures for the city's risk profile.

Strengthen financial management to enhance the quality and sustainability of infrastructure investments. A greater focus on the results of budget allocations rather than just the money spent could improve the efficiency of expenditures and the quality of outcomes. Currently, the Can Tho CPC (through the DOF) has limited decision-making authority over recurrent expenditures as these often fall under mandates from the central government on their usage. For example, the DOF noted minimum levels of expenditures on science/tech (10-15 percent), education (10-15 percent), and environment (10-15 percent). The consideration of future trends in resource availability or different agencies' operating and capital needs appears limited. The DOF staff reported that if there is a shortfall in revenues compared to projections, which happened in five of the last ten years from 2004-2013, the city usually makes cuts to capital investment, road maintenance, or other maintenance expenses. This practice appears reasonable in the face of other short-term budget choices and priorities, but could pose a threat to the robustness of new and existing infrastructure due to poor construction practices and lack of necessary maintenance, respectively.

Strengthen capital investment planning to facilitate better prioritization, monitoring, and achievement of economic development goals. Currently in Can Tho, the capital investment planning process takes place on an annual basis during the normal budget preparation. Technical staff from DPI indicated that departments present projects that are then appraised and approved by DPI, but that final selection of projects is decided by the People's Committee. DPI noted that criteria for selection include socioeconomic benefits but the justification for final selection is not completely transparent (for example, if one project has more beneficiaries than another at the same cost, it would not necessarily be selected). Shocks and stresses to future investments were not considered in the discussions but appeared to play a part only in specifically risk-reducing infrastructure investments such as river management.

Priority Investments

Flood protection measures in the urban core. Flood risk reduction and management decisions should be based on perceived risk reduction benefits and a combination of physical and non-physical solutions on the regional scale of the Mekong Delta. That is, any investments in flood prevention or protective infrastructure must take a river basin approach, considering the impacts of these investments on neighboring provinces in the Mekong Delta. Conversely, the impacts of planned investments further north in the Mekong Delta (and possibly in Lao PDR and Cambodia) must be well understood. The river basin approach could provide both the central government and the provinces with a better and more effective planning tool in managing water resources and water-related disaster events.

Approved by the Prime Minister in 2012, the MARD-developed Flood Control Master Plan for the period 2013-2020 presents a solid foundation for taking targeted action, especially looking at the proposed investments identified for Phases 1 and 2 of the Plan. Specifically, Phase 1 focuses on the urbanized area of Ninh Kieu and includes a ring dike, tidal sluice gate, pumping station, and improvements to the sewer and drainage system. Phase 2 focuses on Binh Thuy (northwest) and includes extension of the dike along the Hau River to the north and a new dike to protect rural areas.

Guide urban growth with transport investments. Transport plays a major role in inducing and guiding urbanization, and transport investments in Can Tho should be used to strengthen the role of the urban core as the locus of development and growth. Current plans may have the effect of reducing population density in the urban core through the creation of multiple growth poles in the province. This includes doubling of the road surface area in Ninh Kieu, which will only accommodate 50,000 new inhabitants, and assumes that most new urban inhabitants will locate in one of the other growth poles along the Hau River. It is recommended to rethink this strategy because the distances are substantial and, if successful, it risks putting substantial (and unnecessary) pressure and traffic on the QL91. An unintended consequence could be that new residents, who would otherwise prefer to locate near Ninh Kieu, would instead be attracted to the Vinh Long province on the other side of the new Can Tho bridge where they would have better accessibility to Ninh Kieu as well as national road connections to Ho Chi Minh City.

The local government would like to reinforce Can Tho's role as the hub of food processing and export for the Mekong Delta Region. To this end, conducting a study of logistics within Can Tho and the surrounding region is suggested prior to investing in new road infrastructure in order to ensure that any transport investments are optimized in terms of value to the city/region. Two key logistical challenges, for example, were identified: (a) ensuring adequate movement of rice and other goods related to food production within Can Tho and to external markets, and (b) ensuring the movement of people and supplies during flooding events. For both, excessive reliance on road-based transport may not be an effective (or cost-effective) strategy. There is an underutilized port located in relatively close proximity to the Can Tho Bridge, and there is an extensive system of canals throughout the area. A logistics specialist could advise on the best way to utilize these assets. Taking into consideration Can Tho's specific circumstances and needs, the logistics specialist could recommend the best strategic mix of resource investments into all of Can Tho's transport assets — port, canals, and roads — to meet the logistics challenges; and at the same time, recognizing that any development and investment in the roadway system will induce some level of urban settlement and activity along those roads, which can have deleterious impacts on development patterns around the city.

Encouraging modal diversity and redundancy will also be important for enhancing the resilience of Can Tho, including public transport (bus-based) development and potentially strengthening waterway transport for passengers and freight. Currently, Can Tho relies on a monoculture of motorcycle-based mobility. Although the city is in the process of developing a plan to strengthen bus-based public transport, infrastructure-related discussions are almost completely focused on roads with the assumption of truck-based freight

and motorcycle-based passenger mobility. Motorcycles are an extremely resilient form of transport, capable of functioning and facilitating access in adverse conditions. However, this does create challenges for road safety and accessibility of certain vulnerable populations (such as the elderly and disabled), as well as air quality and quality of life challenges.

With all of the above in mind, the priority investments in transport identified through the CityStrength Diagnostic would likely include (a) the second bridge crossing at Quang Trung; (b) upgrading and selective provision of new roads in the urban core, especially those that encourage a public transport spine like Tran Hoang Na; and (c) strengthening of waterway transport, subject to the recommendations of a logistics study.

Invest in sanitation to keep up with rapid urbanization. The Can Tho City Sanitation Development Plan, developed under the national Unified Sanitation Sector Strategy and Action Plan, aims to coordinate the environmental sanitation activities of the city departments, the district peoples committees, and other related agencies in the city. It focuses on urban drainage, wastewater collection and treatment, and solid waste management activities, as well as providing direction and guidance to improve environmental conditions in rural areas, industrial zones, handicraft villages, and medical institutions.

The City Sanitation Development Plan will be implemented in two phases: a short-term phase during 2013-2016 and long-term phase during 2016-2020. By 2016, Can Tho plans to develop and improve policies, strengthen institutional arrangements, mobilize adequate financial resources, introduce appropriate/advanced technologies, implement education programs, and build capacity to support the successful implementation of the second, long-term phase of the Plan. These efforts are being supported through technical assistance from the Water and Sanitation Program. By 2020, Can Tho aspires to have an improved drainage system to reduce flooding, a wastewater collection and treatment system that can serve all urban areas of the city, and a solid waste management system that can adequately cope with the volume of solid waste generated by the city. Early attention should be given to resolving the temporary solid waste disposal situation at multiple sites in Can Tho due to the high risk that leachate from the solid waste will contaminate adjacent agricultural fields.

The first wastewater treatment plant in Can Tho is being constructed with financial and institutional support from the German development agencies, GIZ and KfW (€18 million). This treatment plant is located at Cai Sau in South Can Tho and is expected to become functional in 2014. With a 30,000 cubic-meter-per-day capacity, it will only treat wastewater from Ninh Kieu. Efforts should be taken to leverage the investment made in this wastewater treatment facility by promoting private investment in household connections to the sewer. Unless individual buildings are connected to the sewer system, the treatment facility contributes little to thwarting environmental degradation in the city.

Continue to focus on urban upgrading. Addressing encroachment on canals and riverbeds remains a priority, especially in the urban core. Over the last decade, Can Tho has made great progress in upgrading low-income areas (LIAs) and improving the drainage system in the city as part of the Vietnam Urban Upgrading Project (VUUP 1) and the Mekong Delta Region Urban Upgrading Project (VUUP 2). These activities should be scaled up to address the remaining canals in the urban core that are not covered by VUUP 1 and VUUP2. Moreover, there is an opportunity to promote social inclusion and long-term sustainability of the improvements through a more participatory approach with local communities, including Khmer ethnic minorities, for which the poverty rate is three times higher than that of the Kinh people. This will be especially important for smaller canals that have less visibility from public thoroughfares, and are therefore potentially more susceptible to having solid waste disposal and encroachment problems.

Immediate Measures

The following table highlights a set of immediate measures Can Tho can take to begin the process of enhancing its resilience. *What* explains the action that needs to be implemented. *How* outlines the necessary activities required to implement the action. *Why* explains the rationale for the action. And finally, *Who* gives an indication of the most likely department or institution that could be responsible for implementing the action or for providing the necessary input.

WHAT	**Improve Data Collection and Sharing**	**Quantify Damage and Losses from Seasonal Flooding**	**Strengthen Capital Investment Planning**	**Better Understand the Flow of Goods in Can Tho**	**Consolidate Momentum for Sanitation Capacity Building**	**Improve the Coordination of Donor Agencies in the City**
HOW	Set up an open data for initiative to collect and map physical data points	Introduce a standardized damage and loss assessment	Establish a transparent process for ranking proposed capital projects, resilience considerations	Conduct a freight logistics study for road and waterway transport	Leverage WSP support to the newly established City Environmental Sanitation Coordinating Committee	Host a workshop or roundtable discussion with active donor agencies and development partners
WHY	• To improve the quality and responsiveness of physical and financial planning • To promote social inclusion by engaging local communities to collect data	• To enable local officials to quantify the impact of flooding on the local economy and budget • To support the prioritization of flood prevention infrastructure	• To improve the efficiency of expenditures and the quality of outcomes • To establish a more transparent process for selecting investments in infrastructure • To integrate flood and urbanization risks into the formal budget process	• To better understand the demand for improved roadways between rice production areas, national roads, and ports • To assess the feasibility of using waterways for freight transport or back-up freight transport	• To develop and implement capacity building programs to improve and strengthen sanitation management and planning capacity	• To improve the effectiveness and impact of donor support • To create a coordinated portfolio of projects and technical assistance
WHO	CCCO in partnership with Can Tho University could be the home for risk related databases and could coordinate input from all departments DOC could lead on asset data collection	DARD and the SCFSC in close collaboration with DPI and DOF could coordinate The MOF could provide needed input in terms of human and technical resources	DOF could coordinate the action in close collaboration with the DPI with input from other relevant departments	DOT in collaboration with DPI and the Chamber of Commerce	Sanitation Coordinating Committee in collaboration with DPI and DOF	DPI in collaboration for the CCCO

Resources on Can Tho

The following resources were reviewed as part of the CityStrength Diagnostic (some serve as references for citations in the publication). Some sectors were more prominent than others, including urban development, water and sanitation, social issues, disaster risk management, and climate change adaptation.

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Under the Quang Trung Bridge - Can Tho
Cover Photo by Robert Muckley