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Report No.: PAD1504

INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT AND

INTERNATIONAL DEVELOPMENT ASSOCIATION

PROJECT APPRAISAL DOCUMENT

ON A PROPOSED LOAN
IN THE AMOUNT OF US$125 MILLION AND

ON A PROPOSED CREDIT
IN THE AMOUNT OF SDR 90.6 MILLION
(US$ 125 MILLION EQUIVALENT)

TO THE

SOCIALIST REPUBLIC OF VIETNAM

FOR THE

CAN THO URBAN DEVELOPMENT AND RESILIENCE PROJECT

MARCH 3, 2016

Social, Urban, Rural and Resilience Global Practice
East Asia and Pacific Region

CURRENCY EQUIVALENTS

(Exchange Rate Effective as of January 31, 2016)

Currency Unit	=	Dong
22,230	=	US$1
US$1.3805	=	SDR 1

FISCAL YEAR
January 1 – December 31

ABBREVIATIONS AND ACRONYMS

BRT	Bus Rapid Transit
CCCO	Climate Change Coordination Office
CCFSC	City Committee for Flood and Storm Control
CPS	Country Partnership Strategy
DA	Designated Account
DARD	Department of Agriculture and Rural Development
DEM	Digital Elevation Model
DOC	Department of Construction
DONRE	Department of Natural Resources and Environment
DOT	Department of Transport
DRSN	Disaster Responsive Safety Nets
ESIA	Environmental and Social Impact Assessment
EWS	Early Warning System
FM	Financial Management
FMM	Financial Management Manual
GIS	Geographic Information System
GRS	Grievance Redress System
HH	Household
IBRD	International Bank for Reconstruction and Development
ICB	International Competitive Bidding
IDA	International Development Association
IFR	Interim Financial Report
ISP	Implementation Support Plan
LIA	Low Income Areas
LVC	Land Value Capture
NCB	National Competitive Bidding
O&M	Operations and Maintenance
OC	Open Cities
ODA	Overseas Development Assistance
OLTP	Office of Long Term Planning
OSM	Open Street Map
PC	People's Committee
PDO	Project Development Objective
PMU	Project Management Unit
POD	Pedestrian Oriented Design
RP	Resettlement Plan
RFP	Resettlement Policy Framework
SA	Social Assessment

SECO	Swiss State Secretariat for Economic Affairs
SDI	Spatial Data Infrastructure
SMP	Social Management Plan
SORT	Systematic Operations Risk-Rating Tool
TOD	Transport Oriented Development
VUUP1	Vietnam Urban Upgrading Program
VUUP2	Mekong Delta Region Urban Upgrading Project

Regional Vice President:	Axel van Trotsenburg
Country Director:	Victoria Kwakwa
Senior Global Practice Director:	Ede Jorge Ijjasz-Vasquez
Practice Manager:	Abhas K. Jha
Task Team Leader:	Marc Forni /Hoa Thi Hoang

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PROJECT APPRAISAL DOCUMENT

EAST ASIA AND PACIFIC REGION

Social, Urban Rural and Resilience Global Practice

Report No.: PAD1504

Basic Information			
Project ID P152851	EA Category A - Full Assessment		Team Leader(s) Marc S. Forni, Hoa Thi Hoang
Lending Instrument Investment Project Financing	Fragile and/or Capacity Constraints [ ] Financial Intermediaries [ ] Series of Projects [ ]		
Project Implementation Start Date 24-March-2016	Project Implementation End Date 30-Dec-2021		
Expected Effectiveness Date 30-June-2016	Expected Closing Date 30-Jun-2022		
Joint IFC No			
Practice Manager/Manager Abhas K. Jha	Senior Global Practice Director Ede Jorge Ijjasz-Vasquez	Country Director Victoria Kwakwa	Regional Vice President Axel van Trotsenburg

Borrower: Can Tho City People's Committee			
Responsible Agency: Can Tho City People's Committee			
Contact:	Vo Thanh Thong	Title:	Chairman
Telephone No.:	07103754084	Email:	canthonuup@gmail.com

Project Financing Data(in US$, millions)					
[X]	Loan	[ ]	IDA Grant	[ ]	Guarantee
[X]	Credit	[ ]	Grant	[ ]	Other

Total Project Cost:	322.00	Total Bank Financing:	250.00
Financing Gap:	0.00		

Financing Source	Amount
BORROWER/RECIPIENT	62.00
International Bank for Reconstruction and Development	125.00
International Development Association (IDA)	125.00
Swiss State Secretariat for Economic Affairs (SECO)	10.00
Total	322.00

Expected Disbursements (in US$, millions)

Fiscal Year	2016	2017	2018	2019	2020	2021				
Annual	5.00	55.00	70.00	70.00	40.00	10.00				
Cumulative	5.00	60.00	130.00	200.00	240.00	250.00				

Institutional Data

Practice Area (Lead)

Social, Urban, Rural and Resilience Global Practice

Contributing Practice Areas

Cross Cutting Topics

[X] Climate Change
[ ] Fragile, Conflict & Violence
[X] Gender
[X] Jobs
[ ] Public Private Partnership

Sectors / Climate Change

Sector (Maximum 5 and total % must equal 100)

Major Sector	Sector	%	Adaptation Co-benefits %	Mitigation Co-benefits %
Public Administration, Law, and Justice	Sub-national government administration	10	100	
Information and communications	Information technology	5	100	
Transportation	Urban Transport	30	100	
Water, sanitation and flood protection	Sanitation	10	100	
Water, sanitation and flood protection	Flood protection	45	100	
Total		100		

☐ I certify that there is no Adaptation and Mitigation Climate Change Co-benefits information applicable to this project.

Themes		
Theme (Maximum 5 and total % must equal 100)		
Major theme	Theme	%
Environment and natural resources management	Climate change	15
Urban development	Municipal governance and institution building	20
Urban development	Other urban development	25
Social protection and risk management	Natural disaster management	40
Total		100

Proposed Development Objective(s)

The Project Development Objective is to reduce flood risk in the urban core area, improve connectivity between the city center and the new low risk urban growth areas, and enhance the capacity of city authorities to manage disaster risk in Can Tho City.

Components

Component Name	Cost (US$, millions)
Flood risk management and environmental sanitation	120.9
Urban corridor development	78.9
Spatial planning platform and financial and social protection instruments	6.8
Contingency (10%) and VAT	43.4

Systematic Operations Risk-Rating Tool (SORT)

Risk Category	Rating
1. Political and Governance	Moderate
2. Macroeconomic	Moderate
3. Sector Strategies and Policies	Moderate
4. Technical Design of Project or Program	Substantial
5. Institutional Capacity for Implementation and Sustainability	Substantial
6. Fiduciary	Substantial
7. Environment and Social	Substantial
8. Stakeholders	Low
9. Other	–
OVERALL	Substantial

Compliance

Policy		
Does the project depart from the CAS in content or in other significant respects?	Yes [ ]	No [X]
Does the project require any waivers of Bank policies?	Yes [ ]	No [X]
Have these been approved by Bank management?	Yes [ ]	No []
Is approval for any policy waiver sought from the Board?	Yes [ ]	No [X]
Does the project meet the Regional criteria for readiness for implementation?	Yes [X]	No [ ]

Safeguard Policies Triggered by the Project	Yes	No
Environmental Assessment OP/BP 4.01	X	
Natural Habitats OP/BP 4.04	X	
Forests OP/BP 4.36		X
Pest Management OP 4.09		X
Physical Cultural Resources OP/BP 4.11	X	
Indigenous Peoples OP/BP 4.10		X
Involuntary Resettlement OP/BP 4.12	X	
Safety of Dams OP/BP 4.37		X
Projects on International Waterways OP/BP 7.50	X	
Projects in Disputed Areas OP/BP 7.60		X

Conditions

Source Of Fund	Name	Type
1. IBRD 2. IDA	1. Loan Agreement Article IV (a) and (b) 2. Financing Agreement Article IV (a) and (b)	Effectiveness

Description of Condition
IBRD

(a) The Subsidiary Agreement has been executed on behalf of the Borrower and Can Tho City People's Committee
(b) The Financing Agreement has been executed and delivered and all conditions precedent to its effectiveness have been fulfilled.

IDA

(a) The Subsidiary Agreement has been executed on behalf of the Recipient and Can Tho City People's Committee
(b) The Loan Agreement has been executed and delivered and all conditions precedent to its effectiveness have been fulfilled.

Team Composition

Bank Staff

Name	Role	Title	Specialization	Unit

Marc S. Forni	Team Leader (ADM Responsible)	Senior Disaster Risk Management Specialist	Senior Disaster Risk Management Specialist	GSURR
Hoa Thi Hoang	Team Leader	Senior Urban Specialist	Senior Urban Specialist	GSURR
Nina Masako Eejima	Legal	Senior Counsel	Legal	LEGES
Victor Bundi Mosoti	Legal	Senior Counsel	Legal	LEGEN
Farah Hussain	Finance	Senior Finance Officer	Finance	FABBK
Chau-Ching Shen	Disbursement	Senior Finance Officer	Disbursement	WFALN
Van Anh Thi Tran	Team Member	Senior Transport. Specialist.	Senior Transport. Specialist.	GTIDR
Noreen Beg	Safeguards Specialist	Senior Environmental Specialist	Senior Environmental Specialist	GENDR
Hoa Thi Mong Pham	Safeguards Specialist	Senior Social Development Specialist	Senior Social Development Specialist	GSURR
Thang Toan Le	Procurement Specialist	Procurement Specialist	Procurement Specialist	GGODR
Ha Thuy Tran	Financial Management	Financial Management Specialist	Financial Management Specialist	GGODR
Dzung Huy Nguyen	Team Member	Disaster Risk Management Specialist	Disaster Risk Management Specialist	GSURR
Robert Reid	Team Member	Disaster Risk Management Specialist	Disaster Risk Management Specialist	GCCDR
Wanli Fang	Team Member	Urban Economist	Urban Economist	GSURR
Nga Nguyet Nguyen	Team Member	Senior Economist	Senior Economist	GSPDR
Thomas Bowen	Team Member	Associate		GSPDR
Phuong Thu Nguyen	Team Member	Team Assistant	Team Assistant	EACVF
Thuy Cam Duong	Safeguards Specialist	Environmental Specialist	Environmental Specialist	GENDR
Pierre Arnoux	Safeguards Specialist	Social Safeguard Consultant	Social Safeguard Consultant	GSURR
Mylinh Vu Ngo	Team Member	Financial & Economic Consultant	Consultant	GSURR

Trinh Cong Van	Team Member	DRM, Water and Sanitation Engineer - Consultant	DRM, Water and Sanitation Engineer - Consultant	GSURR
Trinh Quoc Khanh	Team Member	DRM, Water and Sanitation Engineer - Consultant	DRM, Water and Sanitation Engineer - Consultant	GSURR
Gerrit Jan Schiereck	Team Member	DRM, Water and Sanitation Engineer - International Consultant	DRM, Water and Sanitation Engineer - International Consultant	GSURR

Locations

Country	First Administrative Division	Location	Planned	Actual	Comments
Vietnam	Cần Thơ	Thành Phố Cần Thơ		**X**	

I. STRATEGIC CONTEXT

A. Country Context

1. **Vietnam has made strong progress in economic growth and poverty reduction, and continues to undergo transformation from a rural to urban economy**. Vietnam's economic progress has been accompanied by rapid urbanization, sustaining a three percent annual urban population growth rate from 1999 to 2011. In 1999, the percentage of the population living in urban areas was only 23.8 percent (18,243,036). In 2014 that share has risen to 32.95 percent (29,896,442), representing a movement of 11.7 million Vietnamese citizens to cities during that period.[1] The country has graduated to lower-middle-income country status and has recorded among the highest growth rates in the world, which in turn enabled rapid poverty reduction. The international US$1.25 and US$2 a day (PPP) poverty rates have tumbled from 49.4 and 78.1 percent in 1998 to 2.44 and 12.5 percent, respectively.[2]

2. **The Mekong Delta, and by extension Can Tho City, is particularly vulnerable to climate change and hydro-metrological disasters, particularly flooding**. Flooding has significantly impacted the socioeconomic development of the city and the entire Mekong Delta. Each year, about half of the Delta is flooded by overflow of 1 m to 3 m in depth. As one of the 13 Mekong Delta provinces, and being located along the Bassac River (Hau River), Can Tho City shares the hazards of the larger Mekong Delta. The City is susceptible to flooding caused by Mekong alluvial overflow, high tides, and extreme rainfall events. Seasonal flooding typically impacts 30 percent of the city area, but has recently increased to 50 percent.[3] Close to 95 percent of the total land area is less than 1 m above mean sea level, except for the built-up urban area located along the bank of the Hau River, which is about 2 m above mean sea level.

3. **Medium-size cities undergoing rapid urbanization, such as Can Tho City, will have implications on economic growth and poverty reduction goals in Vietnam**. Can Tho has a population of approximately 1.25 million, and an urban annual growth rate of five percent between 2005 and 2012.[4] As the 4th most populated city in Vietnam and the largest city in the Mekong Delta, it is an engine of economic growth for the region. The City is an emerging hub for high-tech agro-industrial production and aquaculture, food processing, and export. As a major actor in the region, Can Tho has a strategic role in promoting food security in the Delta, and concentration of industries, educational institutions, and health facilities. Although the City is growing dynamically, it faces multiple threats to sustainable development that are primarily caused by seasonal flooding, sea-level rise, land subsidence and rapid urbanization. This project will not only protect the city against future flooding, but will also positively influence future urban development into low flood-risk areas of the city, using strategically positioned transport infrastructure.

[1] World Development Indicator (WDI).
[2] Ibid.
[3] Huong and Pathirana (2013) Urbanization and climate change impacts on future urban flood risk in Can Tho city, Vietnam. Journal of Hydrology and Earth System Sciences. Vol. 17, 379–394.
[4] General Statistics of Vietnam (2013). Population and Employment. Average urban population by province. Retrieved October 6, 2014 from http://www.gso.gov.vn/default_en.aspxtabid=467&idmid=3&ItemID=15668.

B. Sectoral and Institutional Context

Sectoral Context

4. **The Mekong Delta is a complex natural system that is home to significant human development and is particularly exposed to disaster and climate risk**. The Mekong Delta is an agricultural center for Vietnam. Climate change and rapid urbanization, manifested through sea level rise and land subsidence, have created an existential challenge to the region. Meanwhile, the negative consequences of development (groundwater extraction, development of heavy infrastructure and construction of a ring dykes across the Mekong Delta) are exacerbating the already significant flooding challenges faced by the region. Along with the effects of climate change, this has resulted in increased disaster risk today and greater risk in the future through more frequent and severe flooding, drought, and storms as well as increasing natural challenges such as subsidence and salinity.

5. **Can Tho, the economic center of the Mekong, suffers significant, regularly occurring flood losses.** Recent flooding in Can Tho has affected an average of 2,000 ha (about 69 percent of the total core urban area) and more than 200,000 people each year. In addition to the serious damages to assets, flooding also interrupts economic activities in these core urban areas. According to the City's analysis, urban flooding caused direct economic damages of more than US$300 million in the last five years. A recent study by the International Institute for Environment and Development estimates total (direct and indirect) annual economic losses due to flooding at US$642 per household, which represents 11 percent of each household's annual income. City-wide, this could represent some US$130–190 million in damages and losses per year due to flooding.[5] Yet the city does not have a strategy or specific instruments to manage these costs efficiently and to reduce the negative development impact from flooding.

6. **A number of factors contribute to flooding in Can Tho, including heavy rainfall, tidal increase, poor drainage in built-up urban areas, and land subsidence**. The core urban area is affected by high tides and heavy rains during flood season, with only about 10 percent attributed to river flooding. Recent analyses show that the maximum water level in Can Tho has continuously increased over the last 15 years even though the water level upstream did not change. The increased water level in the city is caused by stronger influence of tides due to morphology changes of the Hau River and probable land subsidence. In addition, sewer systems in the city are generally old and of insufficient capacity to deal with high rainfall events, while many parts of the city do not yet have drainage systems. Rapid and uncontrolled urbanization has resulted in encroachment on many natural canals, significantly reducing water drainage capacity of the city drainage system. As a result, urban flooding from rainfall events and high tides is a regular occurrence. Projected climate change impacts are expected to worsen this situation.

7. **To support the Government in increasing the resilience of the Mekong Delta region, the Bank is working to develop two separate, but mutually reinforcing investments**. The first investment analyzes the Mekong Delta system as a whole and will propose interventions to address the complex balances for competing resources to strengthen integrated climate resilient management and development (P153544). It will support structural and non-structural measures

[5] "Household Economic Losses of Urban Flooding: Case Study of Can Tho City, Vietnam." 10715IIED:. N.p., n.d. Web. 03 Mar. 2015.

to strengthen, more broadly, regional and provincial-level planning capacity for sustainable Delta-wide development. The second investment—this Can Tho Urban Development and Resilience Project—will invest in supporting Can Tho City, as a socioeconomic development hub and the largest city in the Mekong Delta region, to become more climate resilient and promote sustainable urbanization and transport corridors. This project will align with both the Delta-wide development approach and the flood risk management plans for Can Tho City,[6] which prioritize protecting the core urban area of the city as a necessary immediate action.

8. **The proposed project is part of the World Bank's long-term engagement on the topics of urban development, disaster risk management, and climate change in Can Tho over the last decade**. This includes lending operations such as the Vietnam Urban Upgrading Program (VUUP1) (approved in 2004 with additional financing in 2009; US$50.7 million for Can Tho) and its successor the Mekong Delta Region Urban Upgrading Project (VUUP2) (approved in 2012; US$69.9 million for Can Tho) as well as numerous studies and technical assistance initiatives. The project leverages non-structural infrastructure measures within areas of resilience planning (Local Resilience Action Plan, 2013; City Strength Diagnostic, 2014), climate adaptation (TA for Can Tho City Steering Committee on Climate Change, 2009) and disaster risk management with a focus on flooding (Integrated Flood Risk Management Plan for Can Tho, 2013).

9. **Analytical activities and physical investments are financed by a wide range of other donors in Can Tho City and the Mekong Delta.** To promote coordination, the Bank hosts a "Mekong Delta Roundtable" to help bring together activities undertaken by other partners in the Mekong Delta Region. In addition, the recently completed Mekong Delta Plan by the Dutch, suggests a broad range of interventions to increase resilience and productivity, and wide range of donors are supporting various interventions. Similar to the proposed Project, AFD is proposing a €25 million river flood protection system in the downstream of Can Tho River given the high need for flood protection in the City. In addition, GIZ and KfW are supporting a wastewater treatment plant in Ninh Kieu district, and therefore, this project focuses on drainage instead of wastewater treatment.

10. **Much progress has been made to date on improving urban infrastructure.** The Bank's engagement over the past decade has included a bundle of Bank-financed activities that has resulted in (a) constructed or rehabilitated over 50 km of primary, secondary, and tertiary drainage; (b) dredged and upgraded over 8 km of canals; (c) extended water supply to 13,500 households; (d) provided sewer connections to 84,000 households, and; (e) connected 7,000 households to the power grid. When completed in 2017, the two urban upgrading operations will have addressed most of the large low-income areas (LIA) in the urban core.

11. **The project also builds on and complements the Bank's engagements at the national level towards building financial resilience against disaster and climate risks and improving social safety nets.** SECO-financed technical assistance supports the Government in managing the fiscal cost of disasters without negatively affecting development spending and growth. This project complements work at the national level through bottom up building the demand for the solutions the national government is developing. In parallel, this project builds on the Bank's engagement

[6] Master Plan for City's Irrigation and Flood Control (MARD's decision 1721/QĐ-BNN-TCTL dated July 20, 2012), and Comprehensive Resilience Planning for Integrated Flood Risk Management for Can Tho City (supported by World Bank/GFDRR, 2013).

in supporting the consolidation of social safety net systems through the US$60 million Social Assistance System Strengthening Project that aims to improve the Government's social assistance system by developing innovations in management and service delivery nationwide, and by piloting these innovations in the four project provinces.

12. **Rapid and inadequately planned urban growth in Can Tho has meant that the development of urban transport has become a priority.** Transport infrastructure in Can Tho is predominantly dependent on roads, rendering the transport sector vulnerable to disruptions caused by seasonal flooding. While the city has proactively assessed transport investments based on flood risks, the link between transport and urban land-use planning is not fully taken into consideration. In general, road investments in Can Tho have tended to focus on providing improved access to existing communities or providing access to large-scale economic development sites. The scale and nature of land-use along the roadways has not been sufficiently monitored or planned, and the result has been sprawling growth into low-lying areas. Road investments will use transport oriented development (TOD) approaches to guide more resilient urbanization,[7] to low risk areas on higher ground. Increased accessibility and connectivity as a result of the new and improved transport infrastructure is likely to increase land values and investment opportunities along transport corridors, which is value-creation that the Government can capture using a variety of mechanisms and convert into public revenue.

13. **These transport investments in Can Tho will strengthen the role of the urban core as the locus of development and growth.** Over 85 percent of manufactured goods are transported through roads in Vietnam, while an increasing number of bottlenecks are hampering the movement of goods and people. Thus, improving the efficiency of road freight transportation is critical to support industrialization and modernization of Vietnamese economy as well as to increase the economic returns from investments. Increased accessibility and connectivity as a result of new and improved transport infrastructure is also likely to increase land values and investment opportunities along transport corridors, which is value-creation that the local government can capture using a variety of mechanisms and convert into public revenue.

Institutional Context

14. **In line with the Country Partnership Strategy, governance issues have been taken into account.** The team has considered the key points raised in the CPS during the preparation process, including capacity constraints, transparency, accountability, and community engagement. Capacity building is a major priority throughout this project and is being built into each component, with substantial support through component 3, to support the development of urban resilience systems. Transparency and accountability are being addressed through consultations with stakeholders and communities impacted by the project, including those being resettled, and key women's groups. Public communication and early warning systems will be strengthened by this project, thereby enhancing accountability and citizen engagement. The development of an open source data platform to inform better risk management and urban development will be accessible to the public and use crowd sourcing approaches to gather missing data, such as developing a

[7] Empirical estimates indicate that one new highway passing through a central city reduces its population by about 18 percent in the United States. This implies that aggregate central city population would have grown by about 8 percent had the interstate highway system not been built. Baum-Snow, Nathan; "Did highways cause suburbanization?" 2006.

comprehensive asset inventory, using the Open Cities Program. The project is also aligned with the Bank's recent report on climate change and poverty "Shockwaves"[8] which clearly highlights the link between poverty and disasters. Reducing the number of households affected by floods will have poverty alleviation benefits.

15. **A number of government agencies are involved in flood risk management and urban development, often with overlapping mandates and authorities**. There are two entities with a mandate to coordinate and mainstream flood management in Can Tho—the Climate Change Coordination Office (CCCO) and the City Committee for Flood and Storm Control (CCFSC)—and there are four departments involved in the design, operation, and maintenance of the drainage and flood control systems. Specifically, the Department of Transport (DOT) manages the piped drainage system and part of the open canal system in the city. The Department of Agriculture and Rural Development (DARD), under which the CCFSC is located, manages open canals with an agricultural drainage purpose as well as the flood control system, including embankments and tidal gates. The Department of Natural Resources and Environment (DONRE) is responsible for water resource management. Finally, the Department of Construction (DOC) is responsible for issuing building codes for drainage systems, but does not manage or operate them. There is a need to consider these structures as part of one flood management system with one consolidated operations and maintenance procedure.

C. Higher Level Objectives to which the Project Contributes

16. **This proposed project is supportive of Vietnam's Socioeconomic Development Strategy for 10 years from 2011 to 2020**. The strategy identifies specific measures and resources that are needed to achieve sustainable economic growth, including strengthening environmental protection, mitigating and preventing the adverse impacts of climate change, and further developing urban and rural areas. Specific objectives to which this project is well aligned include (a) quickly develop infrastructure, especially transportation infrastructure; (b) harmoniously and sustainably develop regions, build up new urban and rural areas; and (c) protect and improve environment quality, actively and effectively deal with climate change.

17. **The project is also consistent with the World Bank Group's Country Partnership Strategy (CPS) for Vietnam (2012–2016) (Report 85986-VN) and contributes directly to all three pillars of the strategy**: Competitiveness, Sustainability, and Opportunity. Furthermore, the proposed project would address the cross cutting theme of "resilience" by increasing the ability of Can Tho and its people, economic assets, natural resources, and businesses to withstand the impacts of natural and man-made hazards, including the consequences of climate change. The operation's cross-cutting nature is reflected in its direct support to the following CPS outcomes: improved quality and efficiency of infrastructure services (outcome 1.2), strengthened environmental protection and management (outcome 2.2), enhanced resilience to natural hazards and climate change (outcome 2.3), and improved basic infrastructure and public service delivery and access (outcome 3.2).

[8] "Hallegatte, Stephane; Bangalore, Mook; Bonzanigo, Laura; Fay, Marianne; Kane, Tamaro; Narloch, Ulf; Rozenberg, Julie; Treguer, David; Vogt-Schilb, Adrien. 2016. *Shock Waves : Managing the Impacts of Climate Change on Poverty*. Washington, DC: World Bank. © World Bank. https://openknowledge.worldbank.org/handle/10986/22787 License: CC BY 3.0 IGO."

18. **The proposed project is well aligned with the World Bank Group's strategic Twin Goals of reducing extreme poverty and boosting shared prosperity as it supports citizens among the bottom two quintiles**. According to the 2009 census, 12 percent of the population in Can Tho is poor[9] and 31 percent of the population belongs to the national bottom 40 percent of income, which is much higher than that of the other four central cities and six other provinces. The proposed project is expected to have a positive effect on Vietnam's poverty reduction efforts by improving mobility, flood prevention, and sanitation in the urban core of Can Tho City. Furthermore, activities in Component 3, particularly with regard to disaster responsive safety nets (DRSN), are designed to directly target the poor and vulnerable. Most live and work outside of the city's core, mostly engaging in agriculture. By protecting the urban core, jobs will be protected and created, further strengthening the resilience of those living outside the protected area.

19. **Increasing the city's financial resilience will help protect its fiscal balance and the livelihoods of the poorest.** Better understanding how the city currently finances disaster costs and putting in place dedicated financial mechanisms reduces the need for disruptive mid-year budget reallocation and protects the fiscal balance. The current contingent liability to rehabilitated public infrastructure, cover lost tax revenue and deliver cash support to the poor and vulnerable is not well understood, while systems are not in place to execute those resources effectively. Systems can be put in place to enable the City to more efficiently deliver post-disaster recovery resources to affected populations to mitigate negative coping strategies.

II. PROJECT DEVELOPMENT OBJECTIVES

A. PDO

20. The proposed Project Development Objective is to reduce flood risk in the urban core area, improve connectivity between the city center and the new low risk urban growth areas, and enhance the capacity of city authorities to manage disaster risk in Can Tho City.

21. Approximately 65 percent of the outcome is to reduce flood risk, while 25 percent is focused on improving connectivity to lower risk parts of the City and 10 percent aims to increase the capacity to manage disaster risk in the City. The core urban area is defined as the Ninh Kieu and Binh Thuy districts.

B. Project Beneficiaries

22. Direct beneficiaries will be residents in the project area, based on the population estimates in 2013,[10] it will directly benefit about 420,000[11] people, of which there will be about 24,000 (equivalent to 1.9 percent)[12] people whom are from ethnic minorities (mainly Khmer). Indirect beneficiaries include residents from Can Tho City (1.25 million people) and from MDR (10.3 million people equivalent to 60 percent of total population in the region). Of the total beneficiaries 50.3 percent are women.

[9] World Bank staff calculation based on consumption approach.
[10] *Source:* General Statistics Office.
[11] Residents of Ninh Kieu, Binh Thuy, Cai Rang, O Mon, Thot Not, Phong Dien Districts and immigrants workers and students.
[12] Towards sustainable flood management in Can Tho and vicinity, SCE – 5/2013.

23. In addition, people from other provinces in MDR as well as within the country will also benefit from the project, specifically: 83,000 students (2013), 55,600 immigrants working in Can Tho, 1.3 million tourists (2014), and nearly 835,000 visitors for medical purposes.

C. PDO Level Results Indicators

24. At the project level, PDO indicators for the proposed project include the following, and will be disaggregated by gender, where appropriate:

- Increase in urban core land area protected from rainfall flooding for a 10-year return period and from riverine flooding for a 100-year period
- Reduction in travel time between urban core and Cai Rang center from the north and from the south,
- Number of departments utilizing the Spatial Planning and RiskInfo Platform
- Number of direct beneficiaries , defined as people living in urban core protected against 10-year return flood risk, of which female (number)

III. PROJECT DESCRIPTION

A. Project Components

25. **The project will address the economic, social, environmental and financial dimensions of resilience by strengthening the capacity of the City to manage flood risks on multiple fronts.** Structured as a physical planning program, the project includes a large technical assistance package to integrate both the hard and soft facets of the investments. By protecting the urban core through infrastructure investments to reduce flood risk, the economic impacts of flooding will be reduced, and private capital investments will be stimulated. Road infrastructure investments will serve the dual purpose of flood protection and transport connectivity and, when coupled with capacity enhancement in risk assessment and urban planning, they will cultivate more sustainable and resilient growth into lower risk elevated areas. Complemented with densification and improved public transport in the urban core, the City will become more interconnected and resilient to disasters.

26. **To manage the risks that cannot be reduced through physical planning and investment measures, the project will support improved financial and social resilience to disaster events.** Fiscal risk management measures will provide liquidity, improve budget execution and ensure resources are available to particularly vulnerable populations. For those outside the urban core that are predominantly farmers, a disaster responsive safety net system program will be put in place to ensure financial resources are available to households recovering from flood events. Citizens will be engaged through the Open Cities program, which will play a key role in raising awareness of the project and how to proactively address flood risk.

Component 1: Flood Risk Management and Environmental Sanitation (World Bank funding: US$120.9 million; SECO funding: US$1.5 million)

27. The objective of this component is to reduce flood related risks in the urban core of Can Tho. This component consists of a balance between structural and non-structural measures to help the city manage urban flood risk. The structural measures are a combination of "low-regret" engineering solutions, including surrounding embankment, tidal gates/valves and improved rainwater storage and drainage system.

28. A polder approach will be taken for flood mitigation, which can be expressed as a structural system consisted of a: i) closed "ring embankment with tidal sluicegates/valves" to protect area from high water on outside rivers (river and tide floods); and, ii) drainage system including open canals, sewers, storm rainwater retention, and pumps (if needed). Tidal gates are designed for "embankment function" during closed time and "water discharge function" during gate opening. The drainage system is designed based on rainfall intensity, basin area according to classification and specifications issued by the Government (for example, 1 in 10 year rainfall for open channel design).

29. *Subcomponent 1.1: Priority Flood Control Investments in Urban Core (Ninh Kieu and Binh Thuy Districts).* A limited polder approach with combined-use road allows for a flexible and cost effective approach. A combined system of an elevated road, embankments of Can Tho, Cai Son Rivers, and tidal gates/valves along the line will be a "ring embankment" to protect the core urban area from river and tidal flooding. The design of the level of flood protection will be based on 1 in 100 year flood event.

30. *Subcomponent 1.2: Drainage and Waste Water Systems.* This component will finance the rehabilitation and improvement of canal, drainage and sanitation infrastructure and associated management systems. This will include the dredging primary and secondary canal systems, the creation of rainwater retention areas in the rural area of Binh Thuy District, and the installation of a small pumping station (about 2 m^3/s) in Tham Tuong drainage sub-catchment.

31. *Subcomponent 1.3: Operation of the City Integrated Flood Risk Management System and Early Warning System.* Institutional support will be provided to the help the city develop (a) improved protocols in operating the city flood control and drainage systems in case of emergency (high tide, river flood discharge, and so on); (b) an operations and maintenance (O&M) funding framework for the systems; and (c) coordination and information exchange protocols with other Mekong provinces for integrated river basin management and enhanced flood early warning system; and (d) improved early warning information system, providing and public awareness raising through existing mass media and organizations who have great experiences and network in the communities. Key to early warning and response will be the women's unions, which will be responsible for organizing multiple training workshops.

Component 2: Urban Corridor Development (World Bank Funding: US$78.9 million; SECO funding: US$1.0 million**)**

32. The objective of the transport investments is to increase intra-city connectivity and encourage compact, mixed-use, pedestrian and public transport oriented urban development in the less flood prone area of Cai Rang. Connectivity in Can Tho's urban transport system would be significantly improved, increasing transport-related efficiencies, and reducing transport costs. The urban transport system of Can Tho is formed and oriented along vertical and horizontal axes. There

are only a few horizontal axes connecting to the vertical axes. These horizontal axes are far apart from each other thereby limiting interconnectivity. Thus, transport flows through the urban center, creating increased traffic density in the urban core, increasing transport costs and subsequently product costs, reducing investment attractiveness and competitiveness. Unlinked transport infrastructure also decreases regional and interregional transport connectivity, lowering the speed of goods circulation and subsequently affecting the economic development capability as well as access of residents to social infrastructure.

33. Under this project, transport investments will be used to guide more resilient urbanization,[13] to low risk areas on higher ground. Increased accessibility and connectivity as a result of the new and improved transport infrastructure is likely to increase land values and investment opportunities along transport corridors, which is value-creation that the Government can capture using a variety of mechanisms and convert into public revenue. In doing so, the city has the opportunity to proactively guide urban growth to areas with lower flood risk, including the higher elevation areas near the heart of the city.

34. *Subcomponent 2.1: Road and Bridge Links.* The investments in transport infrastructure will connect vertical axes of the city, facilitating connectivity between new and existing populated area in the city center, improving connectivity between inter-regional urban areas and promoting public transport scheme of Can Tho City. Three road links will be financed, including (a) the Quang Trung Bridge crossing the Can Tho River; (b) the Tran Hoang Na Road, including NH1 side roads from Tran Hoang Na to IC3 intersection; and (c) the Cach Mang Thang Tam to PR 918/Bui Huu Nghia road. The last of these road links will serve the dual purpose of providing flood protection for the urban core. In addition to physical investments, technical assistance on transport and land use, and the first mass transit corridor will be included in the project. The three transport links will benefit from Pedestrian Oriented Design (POD) and will be designed in such a way that they are walkable and dense.

35. *Subcomponent 2.2: Construction of the Residential Area for Resettlement.* The resettlement area is within the protected urban core, which is currently un-developed. It is located in Ninh Kieu District and is an area of 54.5 ha, adjacent to Hong Phat residential area. The area will be designed in line with technical and social specifications ensuring good living conditions for residents. The design of the resettlement areas has been consulted with project-affected households and beneficiaries. A total of 2,140 plots with an area from 63 to 90m2 will be available at the resettlement site. Social infrastructures including one kindergarten, one primary school will also be built. Technical infrastructures include separate sewage and drainage systems, solid waste collection and adequate power and road networks.

36. *Sub-Component 2.3: Effective Transport Systems Management and Equipment:* This sub-component would support feasibility studies on the preparation of a pilot bus rapid transit (BRT) corridor and the establishment of the Public Transport Authority. A second feasibility study will be undertaken to identify opportunities for POD, which will help guide land use planning and the development along integrated transport corridors. An analysis of the City's urban transport system and its interaction with land use and distribution of employment will be supported for land value

[13] Empirical estimates indicate that one new highway passing through a central city reduces its population by about 18 percent in the United States. This implies that aggregate central city population would have grown by about 8 percent had the interstate highway system not been built. Baum-Snow, Nathan; "Did highways cause suburbanization?" 2006.

capture along the road corridors that will be built and upgraded under the project. The public transport study will seek ways to incentivize public transport, in addition to the replacement of buses and upgrading of the city bus system. Finally, a corridor development analysis will be financed under this subcomponent and will be implemented in the road link investments in 2.1.

Component 3: Spatial Planning Platform and Financial and Social Protection Instruments (World Bank funding: US$6.8 million; SECO funding: US$6.0 million)

37. The objective of this intervention is to build management systems to improve spatial planning, data and information management, post-disaster budget execution, and the responsiveness of safety nets to flood events. These activities are expected to improve development planning in a climate and risk informed manner, to strengthen financial resilience and to augment social protection.

38. In Can Tho, detailed area plans that provide guidance on infrastructure development are paper-based. This slows the planning process, makes enforcement of construction permitting less transparent and effective, and hinders the efficient sharing of information across departments. Therefore, a web/based geospatial database will be built, which will serve as a single platform for spatial data and is intended to be used across line departments for spatial planning and infrastructure development. The Platform will be housed in the People's Committee (PC), above the line departments, to ensure a higher level of ownership and commitment from the PC. Housing the Platform in the PC, instead of one of the line departments such as the Department of Construction, will limit rivalries and competition, which is often the key barrier in data sharing and usage. This Platform will have infrastructure assets that include sectors such as transport, water, sanitation and energy, as well as buildings.

39. *Subcomponent 3.1: Risk Informed Spatial Planning Platform.* The subcomponent will finance a web-based geospatial database which will serve as a single platform for spatial data and is intended to be used across line departments for spatial planning and infrastructure development. The Platform will be housed in the PC, above the line departments, to ensure high ownership and commitment from the PC. This platform will include infrastructure assets that include sectors such as transport, water, sanitation and energy, as well as buildings. The PC has confirmed in writing that all future investment planning and budgetary allocations for urban investments in Can Tho will be guided by the outputs of the Platform.

40. *Subcomponent 3.2: Disaster Responsive Social Assistance System:* The objective of this sub-component is to offer a more complete engagement on resilience through additional investments in social protection resilience. This will be done by adapting the City's existing social protection system to become "disaster responsive". A relatively minimal investment in improving and modifying these existing systems (the soon to-be-strengthened social assistance system supported by Social Assistance Systems Strengthening Project – SASSP) will ensure that they are able to be leveraged as vehicles for the delivery of social assistance to households affected by flooding. Specifically, this objective will be achieved by: (a) improving the capacity of the City to provide timely and focused social assistance – in a more transparent manner, through disaster responsive social assistance system that are targeted to affected vulnerable households in the aftermath of a disaster; (b) linking the disaster responsive safety net with appropriate risk financing measures, in order to protect the City's long term fiscal balance. A DRSN will mitigate the impacts

of regular flooding on poverty reduction outside of the City's core and, by extension, boost shared prosperity by ensuring those not directly benefiting from the investments in components 1 and 2 are adequately protected from flood risk.

41. This subcomponent will be done in collaboration with the Social Protection and Labor Global Practice , in close coordination with a project they are undertaking in parallel at the national level Social Assistance System Strengthening Project to "support the Government of Vietnam in strengthening the social assistance system by developing innovations in management and service delivery nationwide" (PDO, P123960).

B. Project Financing

42. The total investment of US$322 million, in which the World Bank IDA finances US$250 million, accounting for 78 percent of the total investment, Swiss State Secretariat for Economic Affairs (SECO) will provide US$10 million, in parallel grant financing making up three percent (co-financing subcomponents 1.3, 2.2, 2,3, 3.1 and 3.2). Counterpart funding will make up US$62 million, accounting for 19 percent of the total investment. Of the Bank financing, US$125 million will come from IDA, while the remaining US$125 million will come from IBRD. The on-lending agreement, with the same terms and conditions of the IDA credit and IBRD loan agreed between the City and Hanoi are 40 percent of IDA proceeds will be on-lent and 60 percent on-grant, while 100 percent of the IBRD proceeds will be on-lent.

Project Cost and Financing

43. Total investment is determined based on project investment proposals and estimates under provisions for norms and unit prices of the city, Ministry of Construction, and implemented projects with similar condition. These proposals might be adjusted during implementation. Details are shown in table 1.Table 1.

Project Cost and Financing (US$, millions)

Component	Total	World Bank funds	SECO funds	Counterpart funds	Proportion of Bank funding
Component 1: Flood risk management and drainage	121.9	120.9	1.5	–	99%
Component 2: Urban corridor development	79.9	78.9	1.0	–	99%
Component 3: Spatial planning platform and Financial and Social Protection Mechanisms	12.8	6.8	6.0	–	53%
Project Preparation and Management	12.9	–	–	12.9	0%
Site clearance and resettlement costs	44.6	–	–	44.6	0%
VAT (10%) and contingency (10%)	43.4	42.25	1.5	4.6	88%

Front end fee and commitment charges		1.15			
TOTAL	**322.0**	**250.0**	**10.0**	**62.0**	**80%**
Proportion of overall funding	**100%**	**78%**	**3%**	**19%**	**–**

C. Lessons Learned and Reflected in the Project Design

44. **This investment will build on the body of support already provided to the City through lending and technical assistance activities over the past decade and from global experiences**. The project incorporates lessons learned from flood risk management investments in Metro Colombo, Sri Lanka, Georgetown Guyana, Buenos Aires Argentina and China. It incorporates lessons in disaster risk financing from Mexico, Colombia and Sri Lanka, while also including lessons in DRSNs from Pakistan, Philippines and Nepal. Finally, it builds on a long term engagement in the urban upgrading from the Vietnam Urban Upgrading Projects 1 and 2.

45. **Many urban flood risk management projects focus only on infrastructure; however, infrastructure alone is insufficient to reduce flood risk.** An integrated approach can be difficult to achieve due to a lack of technical capacity, funding, or resources. In addition, the interests of stakeholders vary, leading to different incentives and motives for action. During project preparation, high emphasis was put on a multi-dimensional approach to flood risk management. As a result, in addition to infrastructure investments, the project will finance non-structural measures, including systems to strengthen the ability of the City to integrate flood risk considerations into future policy-making and investment planning. A limited polder approach with combined-use road allows for a flexible and cost effective approach will be implemented, while rainwater retention ponds will be expanded. To manage the risks that cannot be reduced through physical planning and investment measures, the project would also support improved financial and social resilience to disaster events. Investments in improved planning and early warning are also included, which will serve as the link across the infrastructure investments.

46. **It is risky to overburden local authorities with major infrastructure investments, including operations and maintenance; such initiatives need to be managed and coordinated at planning and finance level**. Considering the lessons and experiences in implementing complex projects through a single line department, this project will be implemented through a PMU that is housed within the PC, above the line departments. Even the most successful projects implemented in Can Tho have demonstrated low levels of post-project sustainability as line departments became responsible for O&M. This is because the line departments lack sufficient resources and administrative capacity. It is important to ensure that key central agencies are engaged in the implementation and O&M of City infrastructure and services. This investment has a specific engagement in building an O&M system that is more efficient to manage and implement, based on lessons learned in Brazil, Belize, and Bhutan.

47. **Bus rapid transport systems need to consider a range of factors to ensure sustainability.** Global experience shows that capturing the full benefits of BRT will require: (i) integrated land-use and transport planning to develop high-density corridors, including key junctions/flyovers and traffic management measures; (ii) ensuring access through a network of

seamless feeder routes; (iii) introducing pedestrian and transit-oriented development; (iv) involving the private sector; (v) having the support of institutions with a regional mandate for operations, parking, and traffic management; and (vi) enabling land value capture mechanisms and channeling to the appropriate beneficiaries. A 2013 IEG review of global World Bank Group transport projects suggests that the user-pays principle in bus rapid transit systems, such as in Bogota, Colombia, have been effective in enhancing cost recovery. Furthermore, when user charges are collected by the agency responsible for operations and maintenance, the agency has the authority and the incentive to use these revenues primarily for operations and maintenance. Introducing schemes such as advertising in bus shelters can enhance revenues to support transport services.[14]

48. **Too often, spatial data is not shared across departments and agencies, reducing the power of this data to guide urban development.** It is therefore critical to construct a robust spatial planning platform to improve the ability of the PC and line departments to understand the current footprint and plan new development. The Open Data for Resilience Initiative, led by the Global Facility of Disaster Reduction and Recovery will lead a systematic technical assistance engagement to ensure that data is readily available and easily accessible to all key stakeholders. A centralized database system of hazards and exposures will be established and officials will be trained on its applications. Establishment of an open spatial planning platform is at the core of the technical assistance program, which will support the city with infrastructure planning and in the enforcement of land use policies and plans.

49. **Disasters must be managed ex-ante instead of being treated as exogenous shocks that cannot be proactively addressed**. This has been documented in a wide array of studies and is the underpinning of the Sendai Framework for Action. A key aspect of project preparation was to emphasize to City officials that disaster risk is a function of exposed assets and their vulnerability to hazard events, and that this risk can be systematically managed through financial instruments. Therefore the city has identified the importance of reducing disaster risk as a good practice to achieving sustainable development goals. Prevention pays and governments can take many actions to reduce disaster risk without incurring additional costs.[15] As a result, this project will seek to improve the City's financial response to disasters through the establishment of a disaster reserve fund and a disaster responsive safety net system.

50. **Across the Bank's Vietnam portfolio, projects tend to disburse more slowly than planned**. This is due to a number of factors, including weak project management units, limited engineering support to manage the design of complex bid packages and limited project readiness. The proposed project is designed with these constraints in mind. In particular, the PMU being utilized has implemented Bank projects for more than 10 years and is in the process of consolidation. In addition, engineering expertise will be brought into the PMU to manage the complex bidding documents for the large infrastructure works. Finally, project preparation is well ahead of typical Bank financed projects in recent years. It is expected that approximately 70 percent of investments should be designed by April 2016.

[14] "Improving Institutional Capability and Financial Viability to Sustain Transport An Evaluation of World Bank Group Support Since 2002"; IEG, 2013.
[15] "Natural Hazards, UnNatural Disasters. The Economics of Effective Prevention," World Bank and United Nations, 2010.

IV. IMPLEMENTATION

A. Institutional and Implementation Arrangements

51. **The Project Management Unit (PMU) of the Mekong Delta Region Urban Upgrading Project (VUUP 2) will lead the preparation and implementation of the proposed project**. VUUP 1 closed on December 31, 2014, and select experienced staff from that PMU have been integrated into the VUUP 2 PMU. A review capacity assessment rated the PMU as Moderately Satisfactory for all main indicators including procurement and Financial Management. The PMU now has 47 staff and will be strengthened to 55–60 staff. Since VUUP 1 and 2 focused on third-level canal dredging and drainage/wastewater network upgrading, the capacity within PMU will need to be strengthened to manage the complex flood risk management and sanitation improvement aspects proposed. The PMU will recruit staff specialized in disaster risk management and water and sanitation engineering, to be available for the preparation of investment bidding documents and for the supervision of the preparation of safeguard instruments. As several sub-components will need direct and proactive involvement from line departments, the PMU will sign Memorandum of Understandings with such departments in order to ensure clear arrangements for implementation and accountability in implementing relevant sub-components.

52. **A Project Steering Committee, chaired by the Vice Chairwoman of Can Tho, was established to provide strategic direction and oversight for the preparation of the project**. The committee includes representation from all related departments of the city. Given its mandate to help facilitate coordination, a representative from the Climate Change Coordination Office will be added to the committee. Its members are leaders from the city's departments such as Planning and Investment, Finance, Construction, Transport, Agriculture and Rural Development, Labor and Social Affairs, Environment and Natural Resources and districts' people committee.

B. Results Monitoring and Evaluation

53. **The city will prepare an annual progress report, in accordance with the format outlined in the Operations Manual.** The progress reports will cover (a) physical and financial progress achieved against agreed indicators; (b) issues and problem areas, including remedial actions; and (c) work programs and cost estimates for the coming year, including revised estimates for the former period. An M&E consultancy will report to the city and will be responsible for overall monitoring and supervision of the implementation and impact of various components. They will also supervise implementation of the overall environment and social safeguards and resettlement process, review and monitor for each subprojects the specific social and environmental management plans and supervision of their implementation. M&E would be carried out using latest technology, such as satellite imagery and Geographic Information Systems (GIS) where necessary.

C. Sustainability

54. **Physical Sustainability**. Five options for physical investments were considered for this project to protect the urban core of the City and the top selection was considered based on a detailed hydraulic and exposure model. The selection criteria focused on the highest economic rate of return and the lowest negative impacts, using a 'low regrets' approach to climate change.

Infrastructure investments are designed to be more resilient to physical conditions than they are at the present time, which will assure improved physical sustainability of the infrastructure. Using international best practices for engineering designs, construction supervision, and technical audits, quality of work will be assured. In addition, the design will account for demographic, topographic, hydrologic, and land use/cover changes.

55. **Financial Sustainability**. The physical investments being made will reduce the annual contingent liability posed by disasters, and therefore reduce the fiscal burden on government accounts. In addition, the proposed project will build capacity within the Government to reduce their contingent disaster liability by improving the design and quality of public and private new construction that will be more resilient to adverse events. A fiscal analysis was completed to ensure that sufficient counterpart funds will be available for resettlement and to verify that the City has the capacity to repay the debt incurred. It was found that the City has adequate resources.

56. **Institutional Sustainability**. Institutional sustainability is often difficult to achieve and suffers from a lack of adequate resources to support the counterparts. In the case of this project, institutional sustainability will be particularly high due to the significant financial and technical support from SECO to support the technical assistance program. A key outcome of the project will be improved capacity of line departments to engage in long-term urban planning and flood risk management in order to build and maintain climate resilient infrastructure investments. Of particular emphasis is analytical and technical support to the city to improve its approach to flood risk and urban development—from an ad hoc system of rehabilitation to a data-driven decision making approach founded upon long-term planning.

V. KEY RISKS

A. **Overall Risk Rating Explanation.** The overall risk rating for the project is Substantial.

57. **Technical**. Overall technical risks are rated Substantial. Due to the complexity of the flood problems in Can Tho, and coordination required for the effective operation of flood prevention infrastructure, the technical risks related to Component 1 are rated as Substantial. The transport interventions proposed under Component 2 are not complex, but the scope of urban development planning and implementation along these corridors presents a new capacity challenge for the city. International and national experiences in public transport corridor development have demonstrated consistently that, beyond the technical transport aspects, an essential element of project success is to incorporate high-quality people-oriented design to both the transport and land use plans, which is challenging in Vietnam due to the low level of priority given to pedestrians. The Bank team will carry out a series of design workshops with the client and a wide range of stakeholders to incorporate an appropriate public transport corridor design for Can Tho.

58. **Fiduciary.** Overall the fiduciary risk is rated as Substantial after mitigation measures are fully implemented. From the financial management and procurement sides, the risks mainly relate to the cumbersome and protracted Government procedures for internal reviews and approvals; lack of transparency and accountability; insufficient oversight by Government institutions; limited capacity and experience in handling large contracts. Consequently, the project will likely suffer from substantial delays in implementation, in payment processes, possible irregularities and noncompliance in procurement and financial processes which finally may cause potential fraud

and corruption. In addition, the successful project implementation requires strong linkages among project components and good management and coordination between the PC, related government agencies and the PMU.

59. **Environment and Social.** The risks associate with implementation of project safeguards is deemed to be Substantial. The PMU lacks experience in managing large sized and complex infrastructure investments, and the associated safeguard requirements. Furthermore, the resettlement program is fairly significant and complex. The lack of capacity and experience has been offset to some extent by the completion of the Environmental and Social Impact Assessment, Resettlement Plan and Resettlement Policy Framework, all of which are of good quality. The project incorporates mitigation measures such as: hiring additional environment and social specialist, institutional strengthening, leveraging ongoing experience with projects of similar scale, and an independent supervision firm.

60. **Institutional Capacity for Implementation and Sustainability.** In addition to the financial management and procurement capacity issues mentioned above, the large proportion of counterpart financing that is committed to this project, largely to support resettlement costs is a risk. The city government has confirmed it has the resources available for this and that funding allocation will take place in a timely manner. This has also been confirmed by the Ministry of Finance. In addition, in order to avoid confusion on review/approval functions amongst different cities departments, and city office, a clear set of roles and functions of ODA PMU, especially with regards to technical design approval, as well as procurement review/approval, will be put in place.

VI. APPRAISAL SUMMARY

A. Economic and Fiscal Analysis

61. **The World Bank's triple dividend framework was used to analyze the costs and benefits of this investment.** Potential benefits, or resilience dividends, are evaluated on their immediate to long-term effects in three areas: i) averted losses; ii) increased investments as a result of enhanced economic confidence from disaster safeguards; and, iii) co-benefits, which are the spillover effects typically seen in multipurpose infrastructure.[16] When taken together, the three resilience dividends provide a comprehensive assessment of costs and benefits. The framework was applied to the specific measures of the project components, such as: (1) flood control and waste collection infrastructure, (2) urban corridor development and (3) the disaster response safety net plan.

62. **Economic Analysis Results.** The Internal Rate of Return of all cases in the analyses are significantly higher than 12 percent indicating economic viability of the component. Given the detailed model developed for flood losses and the associated embedded exceeded probability curve, the biggest uncertainty in the analysis is the land value changes. The model was sensitized

[16] Overseas Development Institute. (2015). *Unlocking the 'Triple Dividend' of Resilience: Why investing in disaster risk management pays off*. London: ODI.
Rose, Adam. (2015). *Chapter 3: Capturing Co-Benefits of Disaster Risk Management on the Private Sector Side*. Los Angeles: policy research working paper.

for lower than expected benefits and higher than expected costs and the combined IRR of the investment ranges from 36.15 percent to 43.67 percent, as can be found in the table below.

	1st Dividend Benefits: averted losses		2nd Dividend Benefits: investment stimulus		3rd Dividend Benfits: co-benefits		Overall Project	
	NPV	IRR	NPV	IRR	NPV	IRR	NPV	IRR
Base case	$4,560.93	48.98%	$159.00	40.37%	$508.46	45.40%	$1,494.50	43.67%
20% capital cost increase	$4,533.72	45.02%	$149.01	35.43%	$498.48	36.10%	$1,456.47	39.83%
20% O&M costs increase	$4,552.33	48.94%	$156.68	40.32%	$506.14	45.30%	$1,490.58	43.63%
20% benefits decrease	$3,770.93	44.97%	$122.25	35.37%	$413.46	36.02%	$1,210.45	39.79%
All three scenarios	$3,735.12	41.20%	$109.95	30.51%	$401.16	29.78%	$1,168.49	36.15%

63. **A fiscal analysis was also conducted to ascertain the ability of the City to deliver counterpart funds and to repay the credit.** The current City budget for capital investment is US$188 million in FY2016, and is expected to grow to US$232 million and US$240 million in FY2017 and FY2018, respectively. Sufficient funds are available, and the City identified the three budget lines from which counterpart funds will be allocated.

B. Technical

64. **The project incorporates the impacts of climate change, particularly sea level rise and storm surge, in order to most effectively mitigate tidal and rainfall flooding.** Project designs are based on mid-range climate change projections for sea level, based on the latest UNFCCC research. The height of the flood risk management investments, the width of drainage investments, and the size of the natural retention ponds were designed in light of these climate projections for sea level risk and storm surge. However, there remains uncertainty around the impacts, which makes reduction of the flood hazard challenging to measure. Therefore, a detailed hydraulic analysis has been carried out to identify appropriate design levels of flood control and city drainage system, taking into account of potential uncertainties including climate change, fast urbanization, and land subsidence. In order to measure the production of affordable land and housing in low-risk areas as part of the project's results indicators, there will be updated flood maps along with an accessibility model to measure improved accessibility in low-risk areas.

65. **With regard to the drainage infrastructure, a complete upgrading of the drainage and secondary canal system is planned for Ninh Kieu and Binh Thuy.** As a result of this investment, the urban core will have comprehensive coverage of the drainage system. Previous investments (VUUP 1 and 2) have focused on secondary and tertiary drainage canals, while this investment will address primary canals and complete the rehabilitation of the existing drainage system. These investments, combined with the KFW-supported waste treatment plant, will ensure that there is capacity to treat all wastewater conveyed by the upgraded drainage system. As a result, these investments will reduce flood related losses and improve existing health conditions.

C. Financial Management

66. **Project financial management risk is assessed to be Moderate after the mitigation measures are in place.** An assessment of the financial management arrangements for the proposed project was conducted which concluded that the project meets the Bank's financial management requirements. The FM capacity of the PMU was assessed and FM training was also provided

during preparation stage. It was concluded that the PMU's FM capacity is adequate to manage the project FM arrangements. The FM staffing, budgeting and planning procedures, accounting system (including accounting policies), financial reporting, and internal controls procedures of the PMU are also adequate for financial management purposes. Main FM actions were completed by negotiations including: (i) Officially appoint Project chief accountant; (ii) Finalize Project FM Manual (FMM); (iii) Install the Project accounting software and train for Project accounting staff on the use of Project accounting software; (iv) Internal Audit function to be established in Can Tho ODA PMU with detail description to be included in the Project FMM. A detailed summary of the financial management assessment can be found in Annex 3.

D. Procurement

67. **The PMU, under the oversight of Can Tho PC, is designated as the implementing agency for this project and its procurement capacity has been assessed throughout project preparation**. The Bank undertook a procurement risk and capacity assessment of the PMU and rated the procurement risk as substantial. The main risks identifies and mitigations measures as well as the procurement arrangements are provided in the annex 3. The capacity assessment identified several risks that could arise during project implementation. The PMU has had experience in implementing Bank-financed projects in the past, such as First Vietnam Urban Upgrading Project (VUUP 1) and Second Vietnam Urban Upgrading Project (VUUP 2); however, the procurement capacity needs to be further strengthened. The main risks relate to PMU's limited experience in managing large contract packages in a high-risk procurement environment. Given the complexity of this project compared to VUUP 1 and 2, additional capacity support to the PMU is necessary to manage the flood risk management and drainage investments identified. These procurement risks can be mitigated by undertaking a comprehensive set of measures that would include, but not be limited to, incorporating procurement support and contract management into relevant technical assistance for project management consultancy services. In addition, targeted procurement training, on regular and ad hoc basis, will be delivered to enhance the required knowledge of PMU staff and those of relevant approving authorities.

68. Procurement for the proposed project shall be carried out in accordance with the Bank's "*Guidelines: Procurement of Goods, Works and Non-Consulting Services Under IBRD Loans and IDA Credits & Grants by World Bank Borrowers*" dated January 2011 and revised July 2014 (the Procurement Guidelines); and "*Guidelines: Selection and Employment of Consultants Under IBRD Loans and IDA Credits & Grants by World Bank Borrowers*" dated January 2011 and revised July 2014 (the Consultant Guidelines), as well as the specific provisions stipulated in the Financing Agreement.

69. **Procurement plan and readiness for implementation.** The procurement plan (dated December 9, 2015) for activities to be taken up during the first 18 months of project implementation has been agreed and is available in the project files. The procurement of major civil works, and consultancies has been identified. Detailed engineering designs and bidding documents for more than 30 percent of the project cost have been completed. At time of Board Approval, the City will have completed 75 percent of engineering designs completed. More details on the procurement arrangements are provided in Annex 3.

E. Social (including Safeguards)

70. **The overall social impacts are expected to be positive, although there will be a material amount of resettlement.** The project's social aspects were identified and remedial measures to mitigate social risks are being designed on the basis of a Social Assessment (SA). The key adverse impact relates to the land acquisition. Recommendations arising from the SA and the associated consultations have been taken into account in project design toward minimizing adverse impact of the flooding on local people in general and on vulnerable groups like the poor, migrants and disable people, in particular. A Social Management Plan (SMP), derived from SA recommendations, identify specific actions to be implemented during project implementation. The measures include a communication strategy to raise awareness of the local people and their preparedness to better cope with flooding and climate change situation. In addition, a social protection subcomponent has been established to help vulnerable people better manage the risks and shocks caused by flooding

71. **OP/BP 4.12 - Involuntary Resettlement.** Land acquisition of about 135.4 ha is required and will affect 4,539 households (about 17,700 persons), of which 1,814 would need to be relocated. Of these, 826 would lose more than 20 percent of their agricultural land and 709 would have business affected. As all the project activities are known, a Resettlement Plan (RP) has been developed. Due diligence has been conducted and it has been confirmed that affected households will be compensated appropriately. This RP may have to be updated if there are substantial changes in the project design and/or in the scope of the project impact during project implementation. To guide any potential necessary revisions, a Resettlement Policy Framework (RPF) has been prepared, which will serve as a legal basis for compensation and resettlement activities of the project (as required by the Land Law).

72. **The screening of linked activities showed that there are three linked projects.** Two of these were reviewed (in 2011–2012) during preparation of the Bank-financed Mekong Delta Region Urban Upgrading project (MDR-UUP) and the due diligence review results had shown that there were no outstanding issues and no further actions were required. The third one is the MDR-UUP itself, all land acquisition activities of which have followed the agreed RPF and RP of the project, so no further action will be needed.

73. **Indigenous Peoples Policy OB/BP 4.10**: The surveys prepared for the RP and for the SA conducted by the third party indicated that there are 11 households (HH) belonging to ethnic minorities affected by the Project. However these HH are urbanized and integrated into the urban mainstream way of life. This has considerably reduced their relative vulnerability and cultural distinctiveness relative to the dominant Kinh community. The 11 HH are spread in the City and do not comprise an ethnic minority communities, so OP4.10 is not triggered for this project.

74. **Gender.** Mainstreaming gender into this operation will play an important role during project implementation, especially under capacity building and awareness raising activities. During the ESIA consultations, women were consulted as to how to ensure that female needs are addressed during project implementation. These recommendations are captured in the ESIA, which identifies a need for increased awareness raising on hygiene, sanitation and waste disposal issues. It also calls for gender-targeted information on flood risk and prevention at the household and community levels. In particular, the Women's Unions will lead a campaign and training to

promote a community based approach to improve sanitation behavior and flood early warning actions. These proposed actions aim to inform women about better prevention and sanitation practices that lead to reduced health risks. In addition, female needs have been integrated into the resettlement process and will be monitored throughout the implementation of the resettlement plan. Indicators that will be disaggregated by gender include: Number of women living in Urban Core protected against 25-year return period flood risk; and the number of those in the bottom 40 percent and the number of women in consultation activities during project implementation.

75. **Citizen Engagement.** Consultations took place in the design of the project, especially related to those communities that will be resettled as a result of the project. A key outcome of the consultations was to provide great options to those being resettled. Another consultation is planned during the implementation of the project, which will help close the feedback loop, including to inform the design and targeting of the scalable social safety net scheme. In addition, a satisfaction survey is planned at project completion to inform the results of the project. All consultations will ensure balanced gender representation and disaggregated results. A key area of citizen engagement for this project will be the Open Cities initiative, as part of sub-component 3.1. Similar to other experiences across South Asia, this initiative will engage students, and technical volunteer communities in geospatial mapping. Such engagement will increase the awareness of disaster risk and urban planning amongst the volunteers and participants, while increasing awareness and understanding of the proposed project. Those engaged will serve as project ambassadors amongst their communities, which will further spread awareness and promote engagement. Other technological citizen engagement options will also be explored, particularly related to the end-to-end early warning systems that will be developed under component 1.3 and in the development of apps for the spatial data and RiskInfo platforms to be financed under component 3.1. Other citizen engagement opportunities could also include a public design competition for the new bridge to be built.

F. Environment (including Safeguards)

76. **The project has numerous positive environmental and social impacts.** Under all technical scenarios, it will reduce flooding in Can Tho's urban core, and will strengthen and improve the capacity of existing drainage and sanitation systems. The investment will reduce drain overflows, thereby improving public health, reducing traffic congestion, and leading to an improved standard of living for urban residents. The enhanced aesthetics of the city and improved functionality of roads and pavements will be beneficial to the local tourism and business sectors. Wastewater treatment undertaken under the project will lessen the pollutant load in the Can Tho and Cai Son Rivers. The project will also improve the welfare of the project-affected persons currently living along the river, whom will be relocated to new sites with improved amenities.

77. **OP/BP 4.01 is triggered and the project is classified as a category A** due to the potentially significant and irreversible environmental and social impacts associated with project interventions under three components, although the social impacts due to relocation of over one thousand households has a greater impact than the temporary environmental impacts caused by construction activities, the effects of which will be mitigated by appropriate mitigation measures. The significant environmental impacts are largely positive, as flood risk management investments and the rehabilitation and improvement of canal, drainage and sanitation infrastructure will greatly reduce the pollution load on the Can Tho and Hau Rivers, with resultant significant benefits to

community health and safety**.** As a Category A project, a full scale ESIA was completed in accordance with the Bank's safeguard policies. The ESIA includes an Executive Summary, a cumulative impact assessment, alternatives analysis and a thorough public consultation process.

78. **As part of the ESIA, a detailed review of other, largely completed, ongoing or planned investments in Can Tho has been undertaken to identify possible linkages and potential cumulative impacts.** The assessment and due diligence review ascertained that many of the potentially linked projects are likely to have positive impacts, as they address wastewater and water treatment. Although there is a heavy pollutant load caused by the industrial zone upstream, the project investments would alleviate, rather than exacerbate, the pollution load in the river. The potential cumulative impacts caused by simultaneous construction can be managed with coordination of schedules at the city level, and good construction management.

79. **Induced impacts.** The greater urbanization and densification, resulting in an indirect effect of investments under the Project will have significant positive impacts. However, it will also put a greater strain on basic services. Over time, the City will need to increase investment in wastewater treatment, water supply, electricity supply, traffic management, schools, and health facilities in order to manage the potential negative impacts of increased urbanization and densification. In the coming years, the City will need to follow a disciplined capital investment plan based on realistic forecasts of increased urbanization, and enhance maintenance of existing and planned infrastructure services in order to limit pressure on services that play a key role in limiting flow of emissions into groundwater and surface water, as well as into the urban airshed, such as wastewater treatment and solid waste management. Deviation from such an investment program would lead to increased pollution and decreased human welfare. City planning should also focus on promotion of Bus Rapid Transit (BRT) schemes, and increased and more efficient public transport to reduce traffic congestion and minimize air emissions, particularly the carbon monoxide, hydrocarbons, and particulate matter emanating from two stroke engines. Electricity demand will grow as the city grows in size and affluence, and the use of energy efficient lighting for public streetlights and for commercial, industrial, and residential use should be encouraged. It is critical that zoning laws be strictly monitored and enforced to ensure that there is no repeat encroachment along the river banks.

G. Other Safeguards Policies Triggered

80. **OP/BP 4.04. Natural Habitats.** The project interventions under Components 1 and 2 include strengthening and construction of river embankments, construction of tidal sluice gates, canal dredging, and extension of the sewage system, bridge construction. These project activities would only minimally impact the ecological flow of the Can Tho and Hau Rivers, and it is worth noting that there is already a high level of human intervention due to the urbanized nature of the project area. Hydrological modeling will be undertaken to limit seasonal impacts on aquatic fauna as far as possible. Efforts will be taken to limit impacts on aquatic fauna, for example, through the placement of fish ladders at the proposed sluice gates. Therefore, OP 4.04 - Natural Habitats is triggered.

81. **OP/BP 4.11 - Physical Cultural Resources.** Preliminary site screening has not identified any physical cultural resources in the project location that could be potentially affected by the project. The presence of any cultural, historic, religious monuments, or graves has been assessed

as part of the ESIA and there are no major concerns with regard to Physical Cultural Resources being affected within the project boundary. However, this policy is triggered as the project includes dredging and excavation activities under Components 1 and 2, which may result in chance finds. The ESIA clarifies that the Contractor is responsible for familiarizing themselves with the "Chance Finds Procedures", in case culturally valuable materials are uncovered during dredging and excavation. These Chance Finds Procedures are described in the ESIA and ESMP.

82. **OP 7.50 - Projects on International Waterways.** The project triggers OP 7.50 as the interventions in Component 1 are located in a tributary of the Mekong River, the Can Tho River, and a river further inland—the Cai Son River. However, the proposed investments are river bank embankment works on existing schemes to protect the core urban area from fluvial and tidal flooding, and prevent river bank erosion. An exception to the requirement under OP 7.50 to notify other riparian countries under paragraph 7(a) applies for "any project that relates to a tributary of an international waterway where the tributary runs exclusively in one state and the state is the lowest downstream riparian, unless there is concern that the project could cause appreciable harm to other states." The relevant states include Cambodia, Laos and Thailand. In the case of this proposed project, this exception under paragraph 7(c) of OP 7.50 applies, and was approved by the Regional Vice President, since the infrastructure works will take place on tributaries of an international waterway—the Can Tho and Cai Son Rivers—and will not cause harm to other riparian states.

Disclosure dates for safeguard documents

Safeguards document	Draft Disclosed in Vietnam	Draft Disclosed in InfoShop	Final Disclosed in Vietnam	Final Disclosed in InfoShop
ESIA	Nov 23, 2015	Nov 22, 2015	Feb 18, 2016	Feb 18, 2016
RAP	Nov 23, 2015	Nov 24, 2015	Feb 18, 2016	Feb 18, 2016
RPF	Nov 23, 2015	Nov 24, 2015	Feb 18, 2016	Feb 18, 2016

H. World Bank Grievance Redress

82. Communities and individuals who believe that they are adversely affected by a World Bank (WB) supported project may submit complaints to existing project-level grievance redress mechanisms or the WB's Grievance Redress Service (GRS). The GRS ensures that complaints received are promptly reviewed in order to address project-related concerns. Project affected communities and individuals may submit their complaint to the WB's independent Inspection Panel which determines whether harm occurred, or could occur, as a result of WB non-compliance with its policies and procedures. Complaints may be submitted at any time after concerns have been brought directly to the World Bank's attention, and Bank Management has been given an opportunity to respond. For information on how to submit complaints to the World Bank's corporate Grievance Redress Service (GRS), please visit http://www.worldbank.org/GRS. For information on how to submit complaints to the World Bank Inspection Panel, please visit www.inspectionpanel.org.

Annex 1: Results Framework and Monitoring

Country: Vietnam

Project Name: Can Tho Urban Development and Resilience Project (P152851)

Results Framework

Project Development Objectives

PDO Statement

The proposed Project Development Objective is to reduce flood risk in the urban core area, improve connectivity between the city center and the new low risk urban growth areas, and enhance the capacity of city authorities to manage disaster risk in Can Tho City.

These results are at	Project Level

Project Development Objective Indicators

Indicator Name	Baseline	Cumulative Target Values						
		YR1 2016	YR2 2017	YR3 2018	YR4 2019	YR5 2020	YR6 2021	End Target 2022
Increase in urban core land area protected from rainfall flooding for a 10-year return period and riverine flooding for 100-year return period (ha)	0	0	0	0	200	2,500	2,675	2,675
Reduction in travel time between urban core and Cai Rang center, (% change)								
- From NK to IC3	0	0	0	0	15	25	25	25
- From NVC-Bus	0	0	0	0	15	30	30	30
Number of Dept. utilized Spatial Planning and RiskInfo Platform	0	0	0	0	1	3	7	7

Number of direct beneficiaries, defined as people living in Urban Core protected against 10-year return period flood risk (of which are female (#))	0	0	0	0	0	420,000 (216,000)	420,000 (216,000)	420,000 (216,000)

Intermediate Results Indicators

		Cumulative Target Values						
Indicator Name	Baseline	YR1	YR2	YR3	YR4	YR5	YR6	End Target
Length of new and upgraded embankment installed (m)	0	0	0	2,000	6,000	8,000	10,000	10,000
Length of new and upgraded sewers/pipe installed (m)	0	0	0	2,000	6,000	10,000	12,000	12,000
Length of canals improved (m)	0	0	0	1,500	7,000	11,000	14,500	14,500
Length of roads constructed or upgraded, non-rural (m) – (Core)	0	0	0	3,000	6,000	8,000	10,440	10,440
Number of bridges built, which include sidewalks, connecting the urban core and Cai Rang (#)	0	0	0	0	1	2	2	2
Public transport feasibility and strategy completed	0	0		Non-motorized transport strategy complete	Corridor development plan	Bus network improvement and FS for BRT	Public Transport Feasibility Study Completed	Public Transport Feasibility Study Completed
Spatial Planning and Riskinfo Database Established (Y/N)	No	No	No	No	Yes	Yes	Yes	Yes
Beneficiaries of community-based flood risk management training (#)	0	0	5,000	10,000	25,000	40,000	50,000	50,000

Participants in consultation activities during project implementation, of which female (#) - (Core)	0		200 (100)	750 (375)	1000 (500)	1500 (750)	2000 (1000)	2500 (1250)

Indicator Description

Project Development Objective Indicators

Indicator Name	Description (indicator definition and so on)	Frequency	Data Source / Methodology	Responsibility for Data Collection
Increase in urban core land area protected from rainfall flooding for a 10-year return period and riverine flooding for 100-year return period (ha)	This indicator will measure the area protected from rainfall flooding for a 10-year return period and riverine flooding for 100-year return period. This will be measured based on 2015 data and on detailed hydraulic analysis.	Up-front and end of project implementation	Hydraulic modelling	PMU and M&E Consultants
Reduction in travel time between urban core and Cai Rang center, (% change) - From NK to IC3 - From NVC-Bus	This indicator will measure the percentage of time saving from Ninh Kieu travel to Cai Rang -NK-IC3: travel time from Ninh Kieu Port to Cai Rang -NCV-Bus: travel time from Nguyen Van Cu road to Interlink Bus station in Cai Rang	Annual progress achieved	Survey	PMU and M&E Consultants
Number of Dept. utilized Spatial Planning and RiskInfo Platform	This indicator will measure the incremental progress made in the acquisition of data, development of software, purchase of hardware, training of users and the number of departments that regularly utilize this platform	Up-front and end of project implementation	Survey	PMU and M&E Consultants
Number of direct beneficiaries, defined as people living in Urban Core protected from rainfall flooding for a 10-year return period and riverine flooding for 100-year return period, of which are female (#)	This indicator will measure the number of people that directly benefit from investments to enhance embankments and drainage systems that reduce riverine and rainfall flood risk	Annual progress achieved	PMU based on semi-annual progress reports	PMU and M&E Consultants

Intermediate Results Indicators

Indicator Name	Description (indicator definition and so on)	Frequency	Data Source / Methodology	Responsibility for Data Collection
Length of new and upgraded embankment installed	This indicator measures the total length of new and upgraded embankment of Can Tho and Cai Son installed under the project, expressed in meters (m).	Annual	Project monitoring reports	PMU and M&E Consultants
Length of new and upgraded sewers/pipe installed (m)	This indicator measures the total length of new and upgraded sewers in city core area (NInh Kieu District) installed under the project, expressed in meters (m).	Annual	Project monitoring reports	PMU and M&E Consultants
Length of canals improved (m)	This indicator measures the total length of canals upgraded under the project, expressed in meters (m).	Annual	Project monitoring reports	PMU and M&E Consultants
Length of roads constructed or upgraded, non-rural (m) – (Core)	Meters of non-rural roads constructed or upgraded under the project. Non-rural roads are roads functionally classified in various countries as Trunk or Primary, Secondary or Link roads, or sometimes Tertiary roads. Typically, non-rural roads connect urban centers/towns/settlements of more than 5,000 inhabitants to each other or to higher classes of road, market towns, and urban centers. Urban roads are included in non-rural roads.	Annual	Project monitoring reports	PMU and M&E Consultants
Number of bridges built which include sidewalks, connecting the urban core and Cai Rang	This indicator measures the total number of new bridges constructed under the project. Walkability across the bridges will be a key focus, including sidewalks.	Annual	Project monitoring reports	PMU and M&E Consultants
Public transport feasibility and strategy completed	This indicator measures the number of feasibility assessments and studies completed that will help the City arrive at a comprehensive public transport strategy, which will include feasibility studies for implementation under later investments	Annual	Project monitoring reports	PMU and M&E Consultants

Spatial Planning and Riskinfo Database Established	This indicator measures if the software and hardware required to build the Spatial Data Infrastructure have been acquired and put in place. It also measures whether the necessary data has been populated on the platform so that it is usable by government decision makers for planning purposes.	Annual	Project monitoring reports	PMU and M&E Consultants
Beneficiaries of community-based flood early warning training, of which, female (#)	This indicator will measure the number of women trained in flood early warning and response, as part of the early warning system establishment. The women's unions will be responsible of undertaking these trainings	Annual	Project monitoring reports	PMU and M&E Consultants
Participants in consultation activities during project implementation, of which female (#) - (Core)	This indicator measures the number of individuals that have been consulted at project investment sites throughout the course of the project	Annual	Project monitoring reports	PMU and M&E Consultants

Annex 2: Detailed Project Description

VIETNAM: Can Tho Urban Development and Resilience Project

1. The proposed project is part of the World Bank's long-term engagement on the topics of urban development, disaster risk management, and climate change in Can Tho over the last decade. This includes lending operations such as the Vietnam Urban Upgrading Program (VUUP1) (approved in 2004 with additional financing in 2009; US$50.7 million for Can Tho) and its successor the Mekong Delta Region Urban Upgrading Project (VUUP2) (approved 2012; US$69.9 million for Can Tho) as well as numerous studies and technical assistance initiatives. The project leverages non-structural infrastructure measures within areas of resilience planning (Local Resilience Action Plan, 2013; City Strength Diagnostic, 2014), climate adaptation (TA for Can Tho City Steering Committee on Climate Change, 2009) and disaster risk management with a focus on flooding (Integrated Flood Risk Management Plan for Can Tho, 2013). To date, this bundle of activities has (a) constructed or rehabilitated over 50 km of primary, secondary, and tertiary drainage; (b) dredged and upgraded over 8 km of canals; (c) extended water supply to 13,500 households; (d) provided sewer connections to 84,000 households, and; (e) connected 7,000 households to the power grid. When completed in 2017, the two urban upgrading operations will have addressed most of the large low-income areas (LIA) in the urban core.

2. The aim of this project is to address the two primary threats to its socioeconomic 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. While previous investments have focused exclusively on urban upgrading, the proposed project will support resilient development by proactively guiding growth to low risk areas near the heart of the city while improving connectivity in the city center, sanitation and the living and working environment. For those that do not live within the urban core that will be better protected from flooding, a system of disaster responsive safety nets will be supported to ensure that the city is able to deliver resources to the poor and vulnerable impacted by flooding. Therefore, the proposed project comprises two structural components (1 and 2) and an infrastructure information management systems component (3).

3. The construction of transport links such as link between CMT8-provincial road 918, Tran Hoang Na Road and Bridge, and 2nd unit of Quang Trung Bridge is necessary and urgent to address the aforementioned urbanization issues and increase connectivity, decrease transport time from main urban axes to the national highways, port clusters, airport branching to other provinces in the region. Furthermore, the transport investments will promote land development along the routes, which will increase public revenues and connect residential areas, sport centers, and university villages. These investments are expected to redistribute the population to live in areas with lower risks from climate change impacts. Increased accessibility and connectivity as a result of the new and improved transport infrastructure is likely to increase land values and investment opportunities along transport corridors, which is value-creation that the Government can capture using a variety of mechanisms and convert into public revenue.

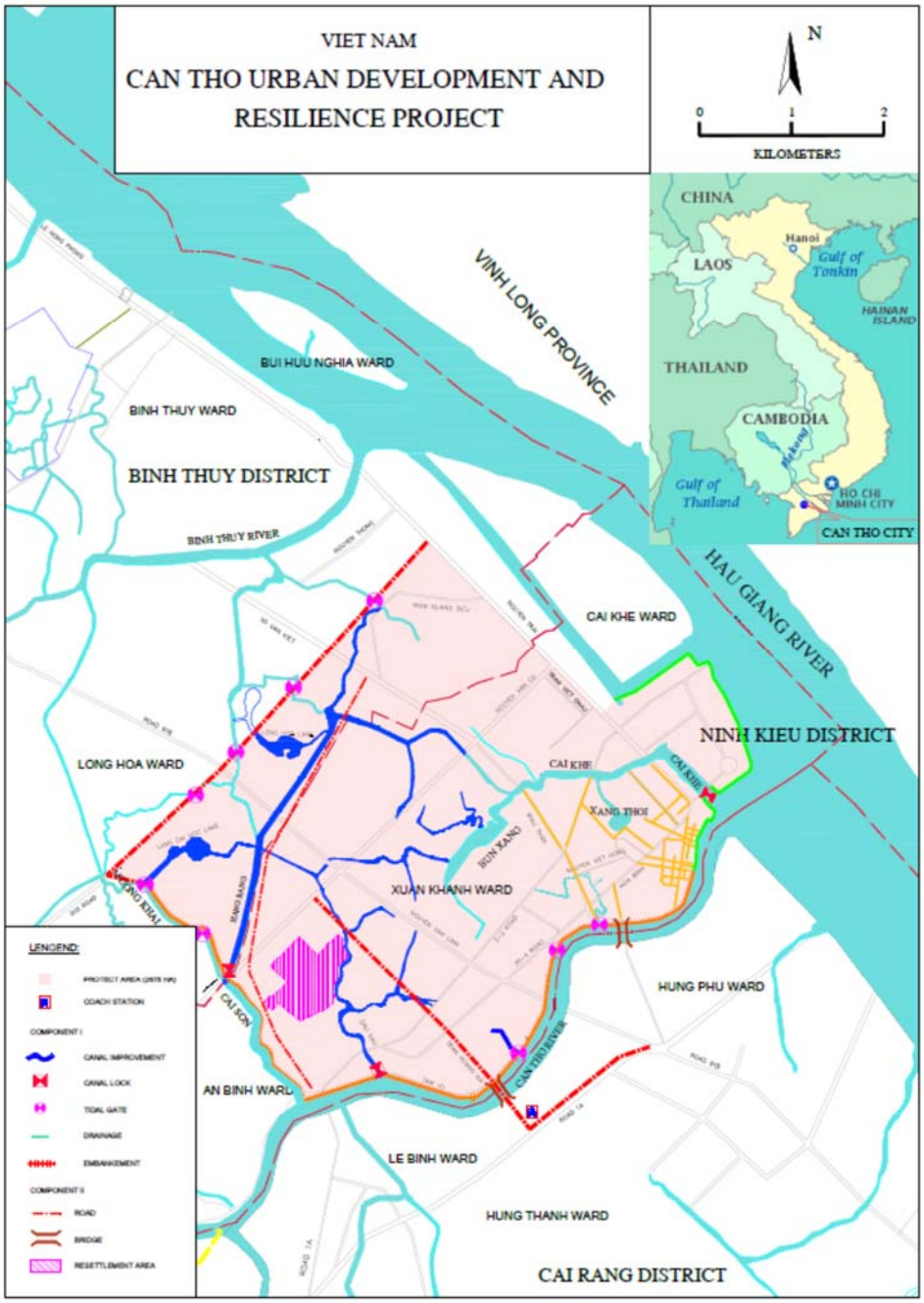
4. A combination of "low-regret" engineering solutions,[17] including surrounding embankment, tidal gates/valves, and improvement in the drainage system is the most appropriate and necessary solution to address the flooding challenges in the urban core. However, none of these interventions alone is sufficient to reduce the flood risk in the city. It is necessary to complement the engineering interventions with sustainable nonstructural measures, including green structures, permeable surfaces, water retention areas, multistakeholder coordination, flood response standard operating procedures, and early warning systems. Due to extensive needs and limited financial capacity, it was agreed by both the national entities and city authorities that a phased approach should be considered, with each phase having clear targets for institutional development and infrastructure investments.

5. Complementing the infrastructure investments to be financed, activities will be supported to better help the city improve the quality, responsiveness, and coordination of physical planning and infrastructure maintenance. Efficiently processed information would help better plan sustainable urban development pathways and make risk sensitive investment decisions. Such an approach would also improve operation of the drainage and flood control systems, and provide support to emergency and public early warning operations. Support will also be delivered to improve post-disaster budget execution and to deliver additional resources through ongoing safety net systems to ensure that the poor and vulnerable are more protected.

6. By protecting the urban core of the city from flooding and increasing connectivity, the project will promote the densification of the city. From a resilience perspective, densification allows the city to concentrate its resources on protecting a smaller area against flooding, which has numerous other co-benefits. First, compact cities facilitate more efficient and sustainable modes of transport. The population densities are high enough to support public transport and people can live near to their work place and leisure facilities so that people can walk and cycle easily. Second, the approach will reduce sprawl while land in the countryside is preserved and land in towns can be recycled for development. Third, in social terms, compactness and mixed uses are associated with diversity, social cohesion, and good accessibility. Fourth, compact cities are argued to be economically viable because infrastructure, such as roads and street lighting, can be provided cost-effectively per capita. Also, population densities are sufficient to support local services and businesses.

7. Project development options have been studied and selected in consideration of specific natural conditions of Can Tho City, and of the Mekong Delta Region; in accordance with master-plans at national and regional level, and with programs, plans and development orientation for MDR, in accordance with the socioeconomic development master-plan, and the sectoral master-plans of the city with a vision to 2050. The figure below summarizes the investments can be found below.

[17] The "low-regret" solutions would maximize the effectiveness of the urban flood and drainage system operation with low cost, while minimizing negative impacts on flooding and environment to the adjacent areas. Moreover, it would also be built to address the future uncertainties caused by climate change, land subsidence, and fast urbanization progress.



Component 1: Flood Risk Management and Environmental Sanitation (Bank financing: US$120.9 million)

8. A number of factors contribute to flooding in Can Tho, including heavy rainfall, tidal increase, poor drainage in built-up urban areas, and land subsidence.[18] In 2000 and 2011, the Hau River overflowed and caused serious flooding in the Ninh Kieu and Binh Thuy Districts. In

[18] A recent study (Bochum University 2008) shows that more than 210,000 m^3/day of ground water was extracted between 2000 and 2007. As a consequence, the groundwater level in the Tra Noc industrial zone was reduced by 0.5 m/year to 0.7 m/year due to excessive abstraction.

addition, the core urban area is affected by high tides and heavy rains during flood season. Recent analyses show that the maximum water level in Can Tho has continuously increased over the last 15 years even though the water level upstream did not change. The increased water level in the city is caused by stronger influence of tides due to morphology changes of the Hau River and probable land subsidence. In addition, sewer systems in the city are generally old and of insufficient capacity to deal with high rainfall events, while many parts of the city do not yet have drainage systems. Rapid and uncontrolled urbanization has resulted in encroachment on many natural canals, significantly reducing water drainage capacity of the city drainage system. As a result, urban flooding from rainfall events and high tides is a regular occurrence. Projected climate change impacts are expected to worsen this situation.

9. Given the potential of specific investments in the Mekong to negatively impact other provinces, there are several flood risk management plans that have been, or are being, developed for the Mekong Delta Region and Can Tho City. Each of the Mekong Delta plans[19] converge on the priority to protect the developed urban areas/cities in the Mekong Delta, including Can Tho, through a set of flood protection structures and tidal prevention gates. In addition, the flood risk management plans for Can Tho City[20] prioritizes protecting the core urban area of the city—Ninh Kieu and Binh Thuy Districts—as a necessary immediate action. This prioritization takes into consideration the population density, importance of the urban core to the economic growth and development of the city and the entire Mekong Delta Region.[21]

10. The objective of this component is to reduce flood related risks in the urban core of Can Tho. This component would support the city in implementing structural measures for flood protection, drainage, and sanitation included in the Mekong Flood Control Plan, Can Tho Flood Control Master Plan, and Drainage System Master Plan. A combination of "low-regret" engineering solutions,[22] including surrounding embankment, tidal gates/valves, and improvement in the drainage system is the most appropriate and necessary solution to address the flooding challenges in the urban core.

11. Polder approach for flood mitigation can be expressed as a structural system consisting of (1) closed "ring embankment with tidal sluicegates/valves" to protect area from high water on outside rivers (river and tide floods) and (2) Drainage system including open canals, sewers, storm rainwater retention, and pumps (if needed). Tidal gates are designed for "embankment function" during closed time and "water discharge function" during gate opening. The drainage system is designed based on rainfall intensity, basin area according to classification and specifications issued by the Government (for example, 1 in 10 year rainfall for open channel design).

[19] MARD-developed Master Plan for Mekong Delta Irrigation and Flood Control (PM's Decision 1397 dated Sep. 25, 2012), and Dutch-supported Mekong Delta Plan (under the preparation)

[20] Master Plan for City's Irrigation and Flood Control (MARD's decision 1721/QĐ-BNN-TCTL dated July 20, 2012), and Comprehensive Resilience Planning for Integrated Flood Risk Management for Can Tho City (supported by World Bank/GFDRR, 2013).

[21] Urban core area of Can Tho is the home of 360,000 population, and the administrative, economic, and cultural centers of Can Tho City and Mekong Delta.

22 The "low-regret" solutions would maximize the effectiveness of the urban flood and drainage system operation with low cost, while minimizing negative impacts on flooding and environment to the adjacent areas. Moreover, it would also be built to address the future uncertainties caused by climate change, land subsidence, and fast urbanization progress.

Subcomponent 1.1: Priority Flood Control Investments in Urban Core (Ninh Kieu and Binh Thuy Districts)

12. A limited polder approach with a combined-use road allows for flexibility and cost effectiveness. The flood control structures to be built as part of this system include: (i) Can Tho River embankment system (section from Ngo Duc Ke to Cai Son canal) with length of 6.1 km approximately and Caison river embankment of about 3.96km; (ii) relocation of encroaching households; (iii) Construction of tidal sluice gates/valves, ship locks, and one drainage pumping system.

13. The Cach Mang Thang Tam to PR 918/Bui Huu Nghia road, runs across the city and aims to increase the connectivity from the urban core in the east to the under-developed university area in the west. The road starts from National Road #91, and connects the existing rural road located along Cai Khe canal. This road system can function as a flood protection structure to prevent the overflow from Binh Thuy and Hau Rivers. As a result, the core urban area is protected from flooding, while the impact of higher water levels outside the protected area is only 2,800 ha, which is smaller than all other options considered. Due to dual purpose road/embankment, this would also be a cost saving option of approximately US$45 million. The height of the flood protection is being carefully studied. This road is also a critical transport element of the Can Tho Master Plan and is therefore implemented under the urban transport Component 2.3.

14. The river embankment system (Cantho river section from Ngo Duc Ke road to Cai Son canal with length of about 6.1 km and Caison river embankment with length of about 3.96km) will be built, and the adjacent road rehabilitated. The local government's priority is to protect the city from 1 in 100 year floods. This criterion determines the crest level of embankment design. This level is extrapolated from the historical data from the Can Tho hydrology station, which goes back 32 years.

15. The chosen closed system flood protection approach will be effective to protect the urban core against river and tidal flooding, however, this approach could make the urban core susceptible to extreme rainfall, if appropriate drainage system is not installed in parallel. Tidal gates will be constructed (with or without ship locks), to allow water to flow out of the city during low tide. However, during high-tide, the gates will be closed, so if this is combined with a high-intensity rainfall event, the city would not be able to quickly drain the water. Therefore tidal gates must be operated creating as much room as possible for rain water retention in the open canal network. Spaces in the design of the tidal gates at Cai Khe, Dau Sau and Hang Bang location will be reserved for possible future pumping stations that can be added in future years once the performance of the drainage system is monitored and future climate change scenario needs are identified. This allows for a flexible, low-regret approach to be taken allowing for the drainage infrastructure to be enhanced in future years as needed, based on factors including climate change.

Subcomponent 1.2: Drainage and Waste Water Systems

16. Can Tho has a combined Drainage and Sewer system, and the sewer system is the weakest link at the moment. Therefore, improvement of the sewer system is absolutely necessary and is a no regret measure. Without improvement, large investments in the project as a whole are of little use. Many parts of the existing sewer system in the urban core are very old (over 40 years), and

the capacity of the system has been substantially reduced over time. Moreover, the city faces challenges due to tidal intrusion in its canal network. In addition, the city still faces serious issues with disposal of solid waste and industrial waste in its canal network.

17. This component will finance the rehabilitation and improvement of canal, drainage and sanitation infrastructure and associated management systems. This will include the rehabilitation and consistent addition to the drainage system to connect with the collection system in the urban center of Ninh Kieu (with length of about 11 km) about 10 km in the remaining areas of the catchment. It will also finance equipment to support management, operation and monitoring of the drainage system, culverts and canals dredging, pumping station, lakes, and dampers. Besides structural flood protection measures, green and permeable elements will be integrated into the design to reduce surface run off and enhance water retention. In this way, a holistic approach will be used by considering storm water drainage, tidal water intrusion, and wastewater outlets.

18. Specific investments envisioned under Subcomponent 1.2 are provided below.

- Dredging and improvement of primary canal system of Cai Khe-Rach Ngong-Rach Ba Bo-Rach Dau Sau and Hang Bang.
- Dredging and improvement of priority secondary canal networks to ensure the connection with the primary canal system and secondary canal networks improved under the VUUP 1 and 2 projects.
- Creation of rainwater retention areas (1 or 2 depending upon the availability of budget) in the rural area of Binh Thuy District.
- Installation of a small pumping station (about 2 m^3/s) in Tham Tuong drainage subcatchment.

19. The drainage system will be designed based on the following parameters: 90 minutes of localized heavy rain with a 10 year return period for open canal and main sewers; a 5 year return period for secondary sewers; and a 3-year return period for lower-level sewers. These criteria are applied in hydraulic computation to specify the required dimensions of the structural components. This criteria allows for the most economical design, with a certain level of accepted risk, recognizing that some local areas will be flooded when rain fall exceeds design levels.

Subcomponent 1.3: Operation of the City Integrated Flood Risk Management System and Early Warning System.

1.3a: Support for coordinated planning and infrastructure development Office

20. Institutional support will be provided to help further develop the resilience office that reports directly to the People's Committee, and is staffed with senior officials from the relevant line departments. This Office of Long Term Planning (OLTP) will be responsible for understanding and guiding infrastructure development, through the lens of flood risk management and resilience. The OLTP will have the following duties: i) defined information flows and coordination mechanism among line agencies and public participation in infrastructure development; ii) improved protocols in operating flood control and drainage systems in case of

emergency (high tide, river flood discharge, etc.); iii) coordination and information exchange protocols with other Mekong provinces for integrated river basin management and enhanced flood early warning; and iv) an operations & maintenance (O&M) funding framework for the systems.

21. This soft engagement will focus on consensus building across agencies to precisely define and operationalize the OLTP, and the first concrete output of this engagement will be the Standard Operating Procedures for the flood early warning system. The SOPs will provide guidance on managing the tidal gate system to protect the urban core from flood, as identified by the early warning system. In the medium term, a fund for operations and maintenance, managed by the Department of Finance instead of the Line Departments, will be established to ensure sufficient O&M funds are delivered.

22. An Operations Center (OC) will be established under the umbrella of the OLTP. The OC would be responsible for: (i) provision of technical guidance to DARD and DOC on the operation and maintenance of the complex flood protection and water storage and drainage system; and (ii) provision of customized early warning information and messages to the City Committee for Flood and Storm Control for public dissemination. The key outputs include: a) Establishment of the Office of Long Term Planning under the PC, based on a ToR; b) Completion of Standard Operating Procedures for the OLTP for early warning and regular investment planning; and c) Establishment of an Operations Center within the OLTP

1.3b: Strengthen Operations and Maintenance Program

23. Investment in infrastructure maintenance and renewal is critical to ensure adequate service delivery and to reduce unforeseen future expenditures. Unmaintained infrastructure deteriorates rapidly and their vulnerability increases, making them susceptible to failure under normal day-to-day operations and during extreme events such as disasters and climate risks. Hence, a systematic condition assessment of infrastructure and maintenance planning is important to reduce contingent liability and ensure sustainable economic growth. This activity will catalogue existing infrastructure, their purposes and needs, and investments projects underway by undertaking the following tasks: i) Assess capital development process to identify weaknesses in both policy and contracting; ii) Investigate the quality, maintenance and functionality of current infrastructure as well as systems to maintain and improve infrastructure to withstand disaster; iii) Identify weaknesses, the costs of the weakness, and the value of repair or replacement; and iv) Conduct cost benefit analysis of current approach and of long-term impact on average annual losses.

24. The key outputs to this subcomponent are as follows: i) Delivery of a Report to all Government stakeholders detailing the weaknesses in existing policy and planning, weaknesses in existing contracting and procurement, and retrofitting possibilities; ii) Propose budget allocations for recurrent maintenance costs; iii) propose policy and plan development for target sectors and areas

1.3c: Improvement of the early warning system

25. The early warning system (EWS) is composed of three integral elements: forecasting, early warning (including early warning message development) and implementation of onset of

anticipated response actions. A weakness or failure in any one of these elements could result in failure of the whole system.

26. Effective early warning system requires strong technical foundations and good knowledge of the risks. To ensure effectiveness and sustainability, the involvement of community and local stakeholders will be central, particularly in order to improve "last mile" early warning efficacy. The processed information would be accessible by relevant agencies and the public to provide actionable information to citizens and support to emergency and public early warning operations. Public awareness and education are critical. In addition, many sectors must be involved. Effective early warning systems must be embedded in an understandable manner and relevant to the communities which they serve. There are four activities that will be supported in order to improve the EWS: i) improvement of city flood forecasting; ii) establishment of the early warning information presentation; iii) development of the onset of anticipated response; and iv) training and public awareness raising campaign.

27. The expected results from this effort include: i) improved city-level flood forecasting platform; ii) early warning message customized for rural and urban population and sectors; iii) onset of anticipated response actions, including technical details of the city flood control and drainage infrastructures operation; and iv) increased understanding of flood risk of city agencies and population.

1.3d: Subsidence monitoring system

28. A system will be developed for land subsidence analysis, which includes both the installation of monitoring equipment and analysis tools. DONRE will be responsible for managing and analyzing land subsidence. However, land subsidence information will be connected with database and IT Platform that are described in the earlier section since it is used as the inputs for the hydraulic model analysis. To methods of assessing land subsidence will be financed, including: i) monitoring the rate of subsidence with an accuracy of about 1 mm/yr using satellite data; and ii) snapshot analysis, which will be completed based on available geological soil data.

29. The expected results include the following: i) initial quantification and characterization of the current subsidence; ii) a system of ongoing land subsidence monitoring deployed; and iii) an understanding of the extent of land subsidence and the drivers of the sinking, which will inform future infrastructure design and will be used for development planning.

Component 2: Urban corridor development (Bank financing: US$78.9 million)

30. Rapid and inadequately planned urban growth in Can Tho has meant that the development of urban transport has become a priority. Transport infrastructure in Can Tho is predominantly dependent on roads, rendering the transport sector vulnerable to disruptions caused by seasonal flooding. While the city has proactively assessed transport investments based on flood risks, the link between transport and urban land-use planning is not fully taken into consideration. In general, road investments in Can Tho have tended to focus on providing improved access to existing communities or providing access to large-scale economic development sites. The scale and nature of land-use along the roadways has not been sufficiently monitored or planned, and the result has been sprawling growth into low-lying areas.

31. Connectivity in Can Tho's urban transport system could be significantly improved, increasing transport-related efficiencies, and reducing transport costs. The urban transport system of Can Tho is formed and oriented along vertical and horizontal axes. There are only a few horizontal axes connecting to the vertical axes. These horizontal axes are far apart from each other thereby limiting interconnectivity. Thus, transport flows through the urban center, creating increased traffic density in the urban core, increasing transport costs and subsequently product costs, reducing investment attractiveness and competitiveness. Unlinked transport infrastructure also decreases regional and interregional transport connectivity, lowering the speed of goods circulation and subsequently affecting the economic development capability as well as access of residents to social infrastructure.

32. Therefore, under this project, transport investments will be used to guide more resilient urbanization,[23] to low risk areas on higher ground. Increased accessibility and connectivity as a result of the new and improved transport infrastructure is likely to increase land values and investment opportunities along transport corridors, which is value-creation that the Government can capture using a variety of mechanisms and convert into public revenue. In doing so, the city has the opportunity to proactively guide urban growth to areas with lower flood risk, including the higher elevation areas near the heart of the city.

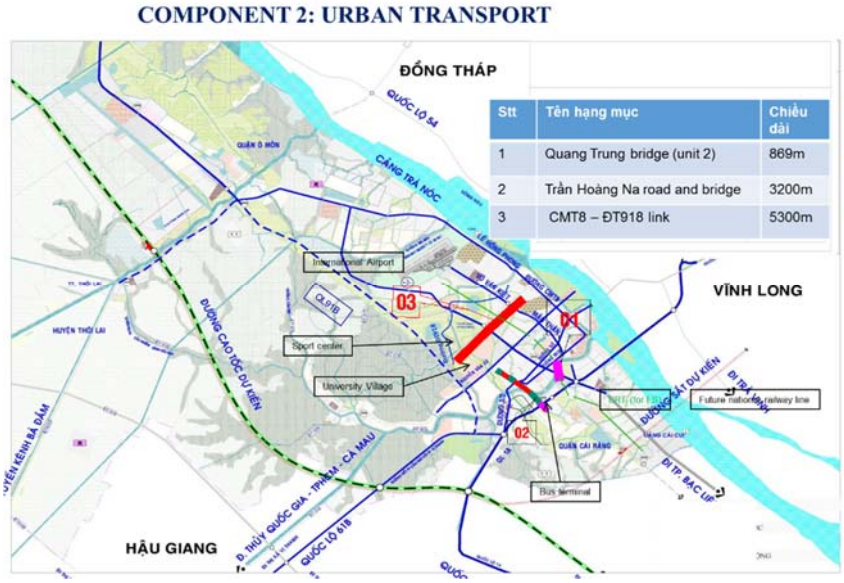
33. These transport investments in Can Tho will strengthen the role of the urban core as the locus of development and growth. Over 85 percent of manufactured goods are transported through roads in Vietnam, while an increasing number of bottlenecks are hampering the movement of goods and people. Thus, improving the efficiency of road freight transportation is critical to support industrialization and modernization of Vietnamese economy as well as to increase the economic returns from investments. Increased accessibility and connectivity as a result of new and improved transport infrastructure is also likely to increase land values and investment opportunities along transport corridors, which is value-creation that the local government can capture using a variety of mechanisms and convert into public revenue.

34. Improving connectivity and promoting densification in the protected urban core will be complemented with support to public transport and pedestrian oriented design (POD). Global experience indicates that rapid urbanization and increasing incomes are normally accompanied by fast growing motorization, which in turn generates or increases problems such as traffic congestion and air pollution. While it is perhaps unavoidable to construct new roads in order to accommodate rapid urban growth, road construction needs to be accompanied by sound urban planning and management. Urban mass-transit system starting with a pilot BRT corridor is very effective for driving the compacted development for the city. The proposed BRT corridor not only connects the airport to the low-risk area of Cai Rang but also encourages the dense/high rise development along the corridor. In order to encourage more and more people to use public bus system, gradual improvement of the existing bus condition should be made. Increase of habit of using bus public transport will create demand for future mass transit system. Investments in augmenting the transport corridors under this project will seek to incorporate POD concepts such as bicycle lanes, sidewalks, and green space.

[23] Empirical estimates indicate that one new highway passing through a central city reduces its population by about 18 percent in the United States. This implies that aggregate central city population would have grown by about 8 percent had the interstate highway system not been built. Baum-Snow, Nathan; "Did highways cause suburbanization?" 2006.

35. The objective of the transport investments is to increase regional connectivity and encourage new urban development in the less flood prone area of Cai Rang. This component will support the city in executing priority investments for transport as identified in the approved Socioeconomic Development Masterplan (2013), Overall Transport Masterplan of the city (2013). The investments in transport infrastructure will connect vertical axes of the city, facilitating connectivity between new and existing populated areas in the city center, improving connectivity between inter-regional urban areas and promoting public transport scheme of Can Tho City. Three road links will be financed, including (a) the Quang Trung Bridge crossing the Can Tho River; (b) the Tran Hoang Na Road, including NH1 side roads from Tran Hoang Na to IC3 intersection; and (c) the Cach Mang Thang Tam to PR 918/Bui Huu Nghia Road. The last of these road links will serve the dual purpose of providing flood protection for the urban core and is therefore also a part of Component 1. A visualization of the main road links to be financed can be found in the graphic below.

Figure 2.1. Component 2 - Urban Transport



36. Given the new construction of road links and the widening of other links, a certain amount of households will be negatively impacted by the project. This project will affect about 3,300 households, 1,400 of which would need to be relocated. A resettlement site of about 40 ha has been identified in An Binh ward, Ninh Kieu District, to accommodate relocation needs of about 1,250 households currently living in Ninh Kieu District. For other districts, there are land plots available in existing residential or resettlement areas which can be bought for relocated people. This component will cover these costs.

Subcomponent 2.1: Key Road Links

- **Quang Trung Bridge crossing from Ninh Kieu to Cai Rang.** Quang Trung Bridge is located in Quang Trung-Cai Cui route, connecting the city center to the new urban area which is planned to be developed into an industrial urban area, where there are new industrial zones and the biggest port in the city, which is under capacity. Quang Trung - Cai Cui Road will connect to NH1 through Can Tho Bridge going to HCMC

and to other provinces of Vinh Long, Soc Trang, Hau Giang. This investment is in accordance with the approved Overall Socioeconomic Masterplan of Can Tho City and the adjusted Transport Development Masterplan up to 2030 of Can Tho City.

- The existing Quang Trung Bridge was constructed in 2000, with total width of 11 m, lane width of 7.5 m. Width of the road to the bridge is 40 m at the Ninh Kieu side and 56 m on the Cai Rang side. Quang Trung Bridge is a bottleneck, with frequent traffic congestions. To facilitate the link between the existing urban core of Ninh Kieu and Cai Rang district, which has low flood risks and is expected to have the fastest growth from now until 2030, construction of a new bridge with the whole length of about 870 m, in which the bridge itself is 480 m and access road of 11 m width is 390 m, will address the issue of traffic congestion in the Southern gateway to the city.

- **Tran Hoang Na Road and Bridge.** Tran Hoang Na Road is considered an urban arterial road connecting to the city center. Presently, some sections (total length of about 1.6 km) are constructed. It starts from Nguyen Van Cu corridor, going through 3/2 road, 30/4 road and ends at NH1 near an inter-provincial bus terminal of 10.3 ha which is under construction. This investment is in accordance with the approved Socioeconomic Masterplan of Can Tho City and the adjusted Transport Development Masterplan of Can Tho City up to 2030. The proposed road will go through a populated area (Ninh Kieu), including newly upgraded Low Income Areas in VUUP 1 and 2, connecting to areas reserved for further development in Cai Rang. This road will also connect the bus terminal to the city center. Total length of the proposed road is about 3.2 km, including a rehabilitated section of 1.6 km, a newly constructed section of about 1.6 km and a bridge of 594 m long and 21 m wide crossing Can Tho River and sections with width of 20 m (section from Nguyen Van Cu to 3/2 road), width of 28 m (section from 3/2 road to National Highway 1A). In addition, there will be an investment in a parallel road in NH1A (section from Tran Hoang Na to IC3 intersection) to connect Tran Hoang Na Road to the parallel road until IC3 intersection.

- The proposed investments will create a transport corridor, promote passenger and goods transport from the inter-provincial bus terminal to the city center, improve accessibility of residents to health care, culture, education, sport services, and other public services in the center area. At the same time, these new roads will help to lessen traffic flow on other roads such as Quang Trung, NH91b and reduce traffic congestions at IC3 intersection, where two existing bridges (Quang Trung and Hung Loi) intersect.

- **Road link between Cach Mang Thang Tam (NH91) - Provincial road PR918:** This dual purpose road and embankment is a critical component of the closed system embankment to protect the urban core from flooding. The road will link CMT8 to provincial road 918, with a length of 5.3 km and width of 40 m. Currently, the first 0.5 km section is Lane 91, which is 4 m wide. The second section in Binh Thuy District center has not been constructed. The investment in this road will create a transversal axis connecting longitudinal axes such as CMT8 road, Vo Van Kiet road, Nguyen Van Linh road, and provincial road DT918 together, promoting transport

from CMT8 to these roads without going into the city, reducing traffic density in the city center. At the same time, it will facilitate faster and easier transport of goods to Can Tho International Airport.

Subcomponent 2.2: Construction of the Residential Area for Resettlement

37. The area is within the protected urban core, which is currently undeveloped, in Ninh Kieu District with an area of 54.5 ha, adjacent to Hong Phat residential area. This will be designed in line with technical and social specifications ensuring good living conditions for residents. More options for utilizing the available residential land plots in the city will be provided to the affected people. A total of 2,140 plots with an area from 63 to 90m2 will be available at the resettlement site. Social infrastructures including one kindergarten, one primary school will also be built. Technical infrastructures include separate sewage and drainage systems, solid waste collection and adequate power and road networks.

Subcomponent 2.3: Effective Transport Systems Management and Equipment

38. The objective of the urban transport system interventions is to increase regional and intra-city connectivity, provide affordable, climate-resilient and safe mobility to all residents and encourage new compact urban development in the less flood-prone area of Cai Rang. Technical assistance would be delivered to support the following activities including baseline diagnostics on the performance of the current urban transport system; studies on enabling conditions that are needed to catalyze the transition towards more effective use of land and provision of high quality transport service and technical analysis to support pilot projects.

39. Three relevant policy documents have been recently approved for the city namely, the General Master Plan of Can Tho City to 2030 with vision to 2050; Revised Transport Master Plan for Can Tho City up to 2020; and Can Tho City Public Transport Network Development Plan to 2020 with orientation to 2030. However, financial sources for realization of the plan are big challenges for the city. Therefore, this project would focus on activities that relate to these plans. This would include (a) study on improvement of the city bus system including a feasibility study on a pilot BRT corridor; (b) study on the performance of the city's urban transport system and its interaction with land use and distribution of employment; and (c) preparation of a citywide spatial plan for non-motorized transport network.

(a) **Study on improvement of the city bus system including a Feasibility study on a pilot BRT corridor**. This will include three main parts: (a) study on improvement of the city bus system following Decision 13/2015/QD-TTg of the Prime Minister; (b) preparation of Feasibility Study on a pilot bus rapid transit (BRT) corridor for the city. This activity is an opportunity for the city to utilize the concept of transit-oriented development (TOD) and pedestrian oriented design (POD) guiding land use planning and development along integrated transport corridors. The pilot BRT corridor is proposed to start at the international airport, run on Vo Van Kiet avenue, cross Quang Trung Bridge, and end at the South Can Tho new urban area of Cai Rang District. The Quang Trung Bridge to be financed by the project would make the corridor an excellent candidate for a mass transit corridor. Based on Fre-FS report, further analysis will be conducted to forecast ridership and modal shift and identify specific needs of physical improvement. Different technical

options from international best practices will be evaluated and selected to provide a cost-effective solution and meanwhile keep flexibility for adapting to future demand; and (c) study on establishment of Public Transport Authority, which will include its potential key functions, internal organizational structure and the relationship with different-level administrations as well as key stakeholders and financing schemes will also be analyzed.

(b) **Study on the performance of the city's urban transport system and its interaction with land use and distribution of employment.** This would entail:

(i) Conduct a travel behavior survey to reveal the modal share of daily trips by purpose, travel distance and income group, and so on;

(ii) Track historical changes of car ownership and motorcycle registration/usage and develop a projection of motorization trend for the next 5–10 years based on the city's economic growth rate and demographic features;

(iii) Conduct traffic analysis for the entire road network in the core urban area to identify hot spots for traffic congestion and accidents;

(iv) Assess service catchment of existing public transit system (bus routes), measured by population or number of jobs covered within 10–15 minute's walking distance;

(v) Investigate land use types, urban development intensity (floor area ratio) and real property ownership status in the proximity of major transport corridors, which helps to evaluate the potential or difficulty of transport infrastructure improvement and densification;

(vi) Evaluate the exposure of transport infrastructure to flood risks by conducting geo-spatial analysis;

(vii) Analyze inter-city passenger and freight flows to reveal the major economic linkages in the Mekong Delta. This has implications for urban development, as cities tend to expand towards the direction of their main business partners.

(c) **Improvement of the non-motorized transport network.** This activity would include an assessment of the connectivity of existing routes for pedestrians and cyclists and identify potential opportunities of building a walkable environment in the design of commercial districts, green space and flood management facilities (for example, dike, flood detention pond), and so on.

(d) **Corridor Development.** Technical assistance will be provided to support corridor development for the road links that will be financed under this project. The City has several development plans for land use and development. However, they do not appear to be well informed by market dynamics, due to limited experience in this area. The transport investment in this project will have positive impacts on the land value, and generate increased interest of both developers and buyers for property in the corridor areas. Therefore, analysis will be undertaken to support the City in improving their

understanding and design of land use and management development programs. The following areas will be studied.

a. *Reviewing existing plan and management to make room for people in urban areas to contribute and benefit from rising prosperity*: conduct a study on existing land management plan and use plan. Adjust land development plans to account for the development of new transport corridors and influx of people into Can Tho.
b. *Planning regulation:* review current zoning code and technical standard for detailed urban design to identify major regulatory gaps and barriers. Based on the review study, make policy recommendations on how to incentivize compact mixed-use development at locations with good accessibility and low flood risks. (Possible instrument include density bonus, transferable development rights and land readjustment.)
c. *Financing schemes*: analyze the possibility of adopting various land value capture (LVC) vehicles, such as tax incremental finance, spatial assessment districts, land concession fee and joint-development, etc., which will serve as potential sources to finance capital investments in transport infrastructure. Suitability of different LVC instruments will be evaluated against multiple dimensions: revenue generation capacity, compatibility with existing legal framework, administration cost and financial sustainability, etc.

Component 3: Spatial Planning Platform and Financial and Social Protection Instruments (Bank financing: US$6.8 million)

40. In Can Tho, detailed area plans that provide guidance on infrastructure development are paper-based. This slows the planning process, makes enforcement of construction permitting less transparent and effective, and hinders the efficient sharing of information across departments. Therefore, a web/based geospatial database will be built, which will serve as a single platform for spatial data and is intended to be used across line departments for spatial planning and infrastructure development. The Platform will be housed in the People's Committee, above the line departments, to ensure a higher level of ownership and commitment from the PC. Housing the Platform in the PC, instead of one of the line departments such as the Department of Construction, will limit rivalries and competition, which is often the key barrier in data sharing and usage. This Platform will have infrastructure assets that include sectors such as transport, water, sanitation and energy, as well as buildings. Given that spatial planning needs to be risk informed due high flooding vulnerability, the foundation layer of this platform will be a hydraulic hydrodynamic flood risk model.

41. Lack of an integrated data management system makes basic urban planning challenging, particularly against the looming impacts of climate change. A new enterprise, standards compliant spatial data infrastructure (SDI) platform, addresses this issue and will be implemented to serve as the central repository to all relevant geospatial data. It is intended to be used across all line departments for spatial planning, infrastructure development, operations and maintenance. Activities under this program will support the collection, collation, aggregation and digitization of imagery, terrain, asset, population, hydrological and climatological data use in an open standards

based enterprise Spatial Data Infrastructure (SDI) and web-based Geographic Information System (GIS) platform.

42. Lack of a robust social assistance (SA) delivery system that is responsive to disasters makes it very challenging to deliver social assistance to households affected by flooding. Can Tho's social assistance system will benefit from participation in a national initiative for "Social Assistance System Strengthening" SASSP which looks to build a more robust SA delivery system. However, this system strengthening will only cover regular support programs and beneficiaries – not those specifically affected by disasters.

43. A relatively minimal investment in improving and modifying these SA systems will ensure that they are able to be leveraged as vehicles for the delivery of social assistance to households affected by flooding. Specifically, this objective will be achieved by improving the capacity of the City to provide timely and focused social assistance - in more transparent manner, through disaster responsive social assistance system that are targeted to affected vulnerable households in the aftermath of a disaster. This new system will mitigate the impacts of regular flooding on poverty reduction outside of the City's core and, by extension, boost shared prosperity by ensuring those not directly benefiting from the investments in components 1 and 2 are adequately protected from flood risk.

3a (i). Spatial Data Infrastructure (SDI) & RiskInfo System

44. Lack of spatial data in a digitized format makes city planning particularly challenging. Therefore, this program will support the collection and digitization of asset data, and the population of that data on a web-based GIS platform. Data collected and digitized will be integrated into a geospatial open data sharing platform that provides the technology, organizational and capacity building framework required for increasing access to geospatial data to stakeholders involved in urban integrated flood risk management.

45. The objective of these activities is to create usable digital information, through data collection and centralization, to build applications and tools that can be used to perform analysis used to inform ongoing decision making, while simultaneously develop trust and social capital networks among line agencies to ensure platform sustainability. The Spatial Data Infrastructure (SDI) platform will provide a one-stop location for users to visualize, download, analyze and share geospatial data and maps, and link to additional sources at the national, regional and global levels. It will also be 'owned' by the People's Committee and housed in the datacenter administered by the Department of Information and Communication and set 'above' the line departments, to ensure fully engaged ownership and a high level of commitment from the PC.

46. The SDI platform will replace current paper-based data collection processes, and is a critical in making data suitable for analysis and the distribution of information more feasible. The system will be interoperable as it will be based on international standards for open data and follow generally accepted best practices. Of which, one design feature is the inclusion of modular attributes, which allows for later stage incorporation of additional system functions, such as flood risk analysis modules, social safety net management systems, asset management systems and traffic management.

47. The SDI platform will enable the city to carry out tasks such as storing, exploring and distributing fundamental spatial datasets for urban planning, analysis, management, monitoring and evaluation of environmental, transportation and land use data. Analysis of spatial data will provide a deeper understanding of assets, infrastructure and social fabric within the City, thereby resulting in better risk informed urban management. The system is intended to foster integrated management and efficient use of public resources through dataset sharing across line agencies using a central information portal.

48. This sub-component will include developing an inventory of the City's public asset base and assess its vulnerability to climate risk using spatial planning platform. The information collected can be used for multiple risk informed planning purposes, including the prioritization of upgrading, operations and maintenance investments. Contingency plans will also be created using the provided data, which will take into account the location and resilience of emergency evacuation routes, schools and hospitals, or energy and water supply lines.

49. Hardware, software, equipment and surveying services will be acquired to setup GIS. The new system will include data on public and private assets, technical infrastructure (e.g., drainage/wastewater networks, water utility infrastructure, electricity supply lines, etc.), as well as transportation and groundwater monitoring data to facilitate the overlay of flood risk data. Support to IT skills development will be provided to all City agencies to ensure routine update and maintenance of information are put into place. This activity will coordinate closely with the World Bank-funded Mekong Adaptation Program currently under preparation.

50. Using the risk informed spatial planning Platform, this sub-component will leverage the asset/exposure database together with the hydrodynamic model, to systematically assess the City's asset vulnerability to disaster and climate change risk. Assessments will be used to prioritize new infrastructure investments and to plan for the operations and maintenance of existing assets, including upgrades and retrofits to maintain service as required by both local and national mandates.

51. The ongoing process of implementing and improving the SDI platform will be spearheaded by a working group comprised of OLTP, line agency staff, academia, NGOs, civic society and other stakeholders. Also included is a database of infrastructure assets across all sectors, including transport, water, sanitation and energy, as well as all a complete buildings inventory. A hydraulic hydrodynamic flood risk model will serve as one of the foundational layers of this platform.

52. Development of the SDI and RiskInfo System will be iterative and follow the following high level principles:

- Flexibility is key - almost all big monolithic government IT procurements are very prone to failure. The overall focus should be on an iterative development approach taking stock of wins, challenges and opportunities for improvement at each stage.

- The software system should be based 100% on open source components and should follow Open Standards and best practices derived from similar or analogous situations both in Vietnam, Southeast Asia and globally.

- The project should strive to make the data open and freely accessible, while being mindful to incorporate features that address security concerns.

- The System should be deployed to the existing ICT Infrastructure (City datacenter) that is housed in the Department of Information and Communication. Continual investment will be supported in this Datacenter to meet the needs of the OLTP and Line agencies.

- The system should be harmonized with other e-government initiatives in Can Tho City.

53. Development of the SDI and RiskInfo System will first a Gap analysis and institutional framework, including the following activities: Identification of Champions in each line agency or stakeholder group; ii(Data Inventory, aggregation and collation (both spatial and non-spatial data); iii) Identification of gaps in current datasets and draft plan for collecting these data; iv) Establishment of a SDI/GIS Working Group within the OLTP; v) Draft data sharing and exchange policy framework; vi) Documentation of requirements, needs and use cases from each agency; and, vii) Initial draft of the technical components, architecture of the system and the IT resources required to support development.

54. Following this effort, a data collection and digitization exercise will take place, based on the needs identified in the gap analysis. This activity is especially critical to the success of the project given that lack of organized and digitized data bottleneck efficient infrastructure planning. Data gathering will follow a vertical collection standard that is based on a common Digital Elevation Model (DEM), and baseline imagery which will be collected together with high resolution LIDAR data. The foundational layer for the hydraulic/hydrodynamic model and all future urban planning activities, such as land subsidence monitoring, will be formed using the DEM approach. DEM collected imagery and LIDAR data will provide the foundational 3D City Model that will serve as the basis for asset, infrastructure data collection and as input exposure data in risk analyses.

55. Both newly collected and digitized existing data will provide a baseline level to measure progress, and garner momentum from stakeholders to help the project reach its full potential of providing information that supports risk informed urban management. Since a significant legacy systems does not exist, it is possible to begin this initiative using either a 'green-field' City Model or the most current international standards use in global Smart Cities projects.

56. Following the data gathering and digitization exercise, the existing datacenter[24], is housed in the Department of Information and Communication, will be augmented in order to further ongoing e-government efforts. Specifically, funds will be used to: i) Continued investment in existing data center in Department of Information and Communication; ii) Development of a 5 year capital investment plan for ICT resources; iii) Development a process and framework for governance and administration of the IT infrastructure; and, iv) Acquisition of other hardware as

[24] The Department of Information and Communication has provided a ~$2M USD proposal for investment in the existing datacenter. To date they have invested ~$750k USD over the past 3 years. This datacenter is being used to support ongoing e-government initiatives of the PC. While existing datacenter investments should be maximized to the fullest extent possible, the City should also seek to achieve lower total cost of ownership and maximum return on investment through economies of scale provided by the public cloud, as well as national or regional clouds.

necessary (weather station, river gauge, subsidence monitoring, surveying equipment, transport cameras, etc.)

57. The systems will be created using an Open Source software approach since it has no licensing costs. Financial savings from this approach will be redirected to build up local expertise required to create, implement and manage these tools. Capacity building to ensure adaptation and absorption of these technological activities will be carried out from an incubated living-laboratory (Lab) that will be formulated through partnerships with line agencies, civic society, the private sector, and universities in Can Tho, Switzerland and the United States, with Can Tho University designated as the leading entity. The Lab with be comprised of technologists, scientists, academics, analysts, designers and project managers who will work together in an iterative development process to deliver an integrated set of applications customized to end-users in the line agencies and the OLTP. Specifically, they will: i) Support ongoing software design, development, staging, operations and production deployment using an iterative development process and framework; ii) Deploy initial set of tools and software needed for the system onto servers; iii) Develop customization software; iv) Deploy/Install desktop tools to local workstations; and v) Develop a process for backup and disaster recovery.

58. The Lab will be a focal point for training and institutional capacity building, which will be an on-going effort spanning over a period of five years. This activity will include participation from both international and local experts with successful experiences in developing coordinated sustainable platforms. Specifically, this activity will develop training curriculums specific to the practical needs of end-users including: i) training in fundamental GIS concepts and theory; and ii) training in basic use of the SDI platform for simple tasks and workflows to line agencies users and other stakeholders; iii) training for intermediate and advanced users in more complex workflows and functions; iv) training for software developers to support continuous systems improvement; and v) training in system administration and maintenance based on a formalized administration planning. Effort will also be made to ensure collaboration and harmonization with regional, national and global GIS and geography education efforts

59. Training and institutional capacity development are expected to result in creation and operation of web applications that can be used by line agencies, OLTP and PC to cultivate a more integrative approach to flood risk urban management. The system should be operationalized using existing hardware infrastructure investments, and other equipment and surveying services needed to setup GIS. The new system will include data on public and private assets, technical infrastructure (e.g., drainage/wastewater networks, water utility infrastructure, electricity supply lines, etc.), as well as transportation and groundwater monitoring data to facilitate the overlay of flood risk data. Support to IT skills development will be provided to all agencies to ensure the regular update and maintenance of information are put into place.

60. These activities will be coordinated closely with the World Bank-funded Mekong Adaptation Program currently under preparation, and will include participation and collaboration with other regional Mekong Delta research projects, including the DRAGON-Mekong Climate Change Research Institute at Can Tho University.

3a (ii). Open Cities Program

61. Open Cities programs support the aggregation and open dissemination of data generation, which supply key inputs into exposure risk analysis to informed decision making. Information collected are standardized into datasets that are developed as Open Standards Based City Models (CityGML), and can be added directly or linked to OpenStreetMap (OSM), a free and editable map of the world with a large global community of participants that has a substantial ecosystem of tools and services.

62. Participatory methods, including community mapping and crowdsourcing using open and collaborative platforms such as OSM, can help to systematically generate asset and exposure data that can be added to the City Model, while having the simultaneous benefit of engaging directly with local and national government, planning agencies, civil society, local academic institutions, and the private sector. Asset data collected will be made available through online data sharing platforms under open license agreements to ensure accessibility to all stakeholders.

63. These activities will be conducted under the leadership of the PC, and will involve technical communities, universities, and the private sector. The Lab will serve as an incubator of this initiative with ongoing research, data creation and development of applications for end-users.

64. Open Cities is intended to help generate and disseminate real time data that are reliable for both short- and long-term disaster risk-informed urban planning. It will also foster an open data community and cultivate a data driven culture among stakeholders. The main objectives are to: i) Collect high resolution physical asset data in Can Tho City that will improve understanding of climate related risks and enhance urban management; ii) Create an enabling environment for the use of open data and build a community of experts, who sustain and manage the data in the long term by involving the government (local, city, and national), universities, civil society, and the private sector; iii) Provide decision makers with relevant data, tools, and visualization to support decision making and efficient allocation of public resources, particularly in areas of major infrastructure expenditure in schools, hospitals and government buildings; iv) Strengthen disaster risk management by supporting detailed contingency plans, targeted post-disaster cash flow transfer, etc.; v) Foster integrated multi-sectoral development of urban services, such as transportation and water systems, using the same data platform to build an ecosystem of risk aware and disaster prepared organizations; and vi) Raise risk and resilience awareness among stakeholders by allowing the project to act as an entry point to other resilience-enhancing engagements.

65. The activities under the Open Cities program will first include a field survey and design preparation in order to: i) Determine project scope and define field survey objectives; ii) Creation of a living laboratory (LAB); iii) Finalize management structure, roles, and responsibilities, and fill local paid positions; iv) Develop and endorse data capture strategy; and iv) Design and implement training sessions on OpenStreetMap, mapping tools and surveying for paid positions and volunteers.

66. Following the planning process, the survey will be implemented, which will involve: i) Manage data collection and entry; ii) Provide quality control checks; and iii) Track progress and report at determined intervals.

67. After the data is collected, it will be synched with the SDI and RiskInfo System, which will require the following: i) Ensure that data is widely available and well documented for maximum reuse by all stakeholders; ii) Integrate of the data collected into government processes and workflows; iii) Foster innovation through technology initiatives such as hackathons, code sprints, fellowship programs, and workshops that fosters civic engagement; and iv) Partner with universities, NGOs, and the private sector on data creation, research and implement methods of data usage to support flood risk and urban management.

68. The Asset and exposure data are key inputs in risk and impact analysis, especially in hydrodynamic modeling, which relies heavily on well-structured and consistent asset dataset to forecast risk scenarios used in decision making. The set of activities in this subcomponent ensure that relevant data are tracked and collected, and will support the following outputs: i) Collection of physical asset inventories (location and characteristics); ii) Delivery of an integrated Open Standards Compliant City Model (CityGML); iii) Collection of all relevant attributes important for characterizing the built environment; iv) Strengthening the capacity of stakeholders in the use of spatial mapping, OpenStreetMap, and GIS; v) Participation of university groups and volunteer technical communities in asset mapping activities; vi) Production of high-quality asset maps and other visualizations for local government use; and, vii) Ongoing community engagement to foster civic participation in the creation of data asset.

3a (iii): Development of a hydrological hydrodynamic flood risk model

69. Flood simulation scenarios from reliable hydrological – hydrodynamic models are critical to flood management planning. Existing models will be updated to include descriptions of flood protection infrastructures, water storage/canal network, and primary underground pipe system, which will be integrated with the Mekong Delta model. Maps of flood hazards and flood risks of the City will be produced from the model, maintained routinely by OC, and made available to line agencies and the public. The model will cover all river and canal networks within Can Tho City, while being synchronized with the existing models for the Mekong delta and watershed, and will integrate the underground drainage system in the urban core. This will improve the forecasting of water levels throughout the surrounding rivers and canals system. Improved flood modelling capacity is critical in adapting to the impacts of climate change, particularly sea level rise and storm surge. A dynamic model will enable government technical experts to evaluate the impact of various climate scenarios to better evaluate the potential long term risks of different flood inundation areas.

70. The model will be built and maintained locally through partnerships with CENRes at Can Tho University, and other regional and national partners, including the national Hydrometeorological service, to allow for development of deep local expertise in usage of tools and best practices of modern scientific hydrology and hydrodynamics. To support the model database, an IT platform will be built that lays out data, allows for their upload and download of their sources, including hydromet data, spatial data, flood damages, flood risk maps, etc. It will enable coupling of various hydrological and hydrodynamic models. In particular, it will couple the integrated hydrological – hydrodynamic model for Can Tho City. It will also couple the coastal model for the simulation of tides and storm surges at the East Sea. The platform allows for future incorporation of the entire Mekong Delta into the models.

71. A reliable integrated hydrological hydrodynamic model will be upgraded based on the existing monitored and anticipated river dynamics, and flood risks. This model will include all river and canals networks, which will be synchronized with the existing models for the Mekong Delta, and will integrate the underground drainage system in the urban core. Maps of flood hazards and flood risks for the City will be produced as a result of the model, and updated routinely, to improve water levels forecasting of the surrounding rivers and canals system.

72. The objective of this model is to support flood risk reduction investment planning, and to operate the flood control and drainage systems in the protected urban core, by triggering when to open and close the flood control structures. An enhanced hydrodynamic flood risk model will support the early warning systems that will be used to inform households in vulnerable areas, while alerting line departments responsible for infrastructure management. This model will serve as the foundation of the Risk Informed Spatial Planning Platform, and will be used together with the City Model and Asset Inventory to prepare analysis and visualizations of Urban Flood Risk, which can be used for Community Engagement to communicate Flood Risk to all relevant stakeholders.

73. These models will be also be used to perform more accurate and detailed Cost Benefit Analysis of proposed engineering interventions, urban planning policy, operations and maintenance and investment decision making. Preparation of the models is an iterative process which requires several following steps followed by a model detailed description of each activity.

74. Key activities to be financed to augment the hydraulic model include: i) Data collection and analysis; ii) Schematization; iii) Calibration and validation; iv) Sensitivity Analysis; and v) Simulation.

75. This hydrological hydrodynamic model will serve as the foundational element of the city-level risk informed spatial planning system, which will be developed as part of this technical assistance package. The models should be based on Open Source software to the greatest extent possible, such that they can be run in the city's existing data center without incurring ongoing license costs. Additionally these models should be based on Open Standards and be integrated with the overall City Model.

76. Additionally, a five year training, capacity building and education effort will be conducted in partnership the Lab to ensure that hydrodynamic modeling capacity is developed locally within the City, so that the integrated flood risk management system operate efficiently and the risks and mitigation strategies, including current and infrastructure investments, can be effectively communicated to the community and all relevant stakeholders.

3b. Establishment of a Disaster Response Safety Net System

77. The first step in this engagement will be an assessment conducted by DOLISA that presents the current state of the social welfare system that is currently in operation in Can Tho. Based on gaps identified in the assessment, assistance will then be structured to improve the current capacity of the Department and the delivery of its social assistance programs. This will be done in alignment with the national level social assistance reforms that are currently underway (through World Bank lending project, "Social Assistance Systems Strengthening Project", SASSP). This effort is focused on to bringing together numerous fragmented social assistance programs and their

information systems under one Management Information System for more effective and efficient delivery, in four pilot provinces (of which Can Tho was not originally one). The implementation of these reforms in Can Tho – effectively as a fifth pilot province - will provide a stronger foundation on which to build this disaster responsive program.

78. Simultaneously, targeted support will be provided in addition to the regular social assistance systems strengthening reforms to ensure that the upgraded social assistance system is able to respond to disasters. This will be done through the following activities:

79. The first activity will expand Can Tho's database (of poor, near-poor and SA beneficiaries households), to cover potential households who may be affected by disasters. To inform data-platform design and targeting, as a first step, an assessment will be made to estimate who are the most vulnerable to the impacts of flooding in Can Tho. This empirical investigation will utilize the upcoming national poverty census, the findings from which will be available in FY16. Microsimulations of the data from Can Tho province will create a profile of the households most in need of assistance from the disaster responsive social protection program, due to their vulnerability to flooding and limited capacity for coping with its impacts.

80. This will, in turn, inform the collection of data on these pre-identified vulnerable households the information on which will be added to the SA database. Consequently, the second step will entail field survey design and preparation will be conducted to, i) determine project scope and define field survey objectives; ii) finalize management structure, roles, and responsibilities, and fill local paid positions; iii) develop and endorse a data capture strategy (including registry vs survey); iv) design and implement training sessions on data collection and updating, mapping tools and surveying for paid positions and volunteers.

81. Third, the survey will be implemented and supervised, which will include: i) managing data collection and entry; ii) Provide quality control checks; iii) Track progress and report at determined intervals.

82. Fourth, a targeting mechanism will be developed to enable real-time identification of eligible households that have been affected by any given flood event, utilizing the system's rich information on geographic location, poverty status etc. This information will inform the delivery of cash based post disaster assistance to the affected households. Enrolling those targeted, disaster affected beneficiaries into the program will be done through approval procedures by relevant government levels and triggered in the system using the relevant Management Information System's functions.

83. This activity will be conducted with the leadership of the PC/DOLISA, and will involve local DivLISSA staff at district and commune levels and Can Tho's residents. Data that are collected will be made available through online data sharing platforms under open license agreements to ensure it is accessible by relevant stakeholders for their respective use.

84. Once the beneficiaries are identified, a protocol to execute the disaster responsive safety net system will be established, which will include the development of the following capacities.

- *Robust systems for delivering payments to the enrolled* – this assessment will investigate the strength of the payment systems utilized by the SP program in Can Tho, and their suitability to deliver benefits post disaster. In particular, this component will investigate/pilot innovative methods (mobile / e-payments, pre-paid debit cards etc.) to deliver payment to not only those households enrolled in the existing SP programs, but also who will be beneficiaries of the scaled-up post disaster program.

- *A Grievance Redress Mechanism* – With payments having been made to identified and enrolled beneficiaries through the aforementioned steps, a grievance redress system (GRS) will be leveraged to manage complaints and reports of inclusion and exclusion errors. A post-disaster setting is of course a highly difficult and fluid environment that poses acute challenges to program targeting and delivery. This component will assess the ways in which the GRS of the existing SP programs can be utilized for this purpose - managing, logging and ensuring resolution of complaints - primarily through scaling it up during an anticipated increased period of case load.

- *Designing the monitoring and evaluation processes* – monitoring the implementation of the disaster linked social protection intervention will be fundamental to ensuring program efficacy and effectiveness, allowing mid-course implementation corrections. Rigorous evaluation will lead to continued program improvement in the longer term. M&E is a fundamental pillar of any SP program, and is implemented by MOLISA in the use of its regular programs (and will be improved upon further as part of the SASSP project). These processes will be tailored to monitor and evaluate each disaster linked social protection intervention in Can Tho, at the local level.

- *An Operational Manual (OM) to inform delivery in a post-disaster setting* – each of the aforementioned systems developments will be captured in an operational manual that will form a pre-prepared for document for Can Tho DOLISA officials to use to inform program implementation and systems adjustments post disaster. This can be done by customizing the national OM developed for the national SASSP in order to accommodate operational demand in a disaster-linked setting.

- *Capacity building for Can Tho officials to develop and implement the OM* – This component will focus on building capacity within DOLISA to deliver the disaster linked SP program, based on the content of the OM. Actually operationalizing the OM, delivering the program in a post disaster setting, will represent a significant institutional challenge. In order for the recommendations and processes of the OM to be practicable, it is necessary to work with counterparts to institutionalize the necessary processes for delivery at the technical level, building capacity among staff, systems and administrative processes. This will ensure development of necessary regulations to guide database management, updating, sharing and exploration. It will also ensure that the OM is integrated at a deeper level within the Department, and as such, that it will more realistically be operationalized and with a higher degree of success.

- *Facilitating policy dialogue at national level for gradually scaling up activities national wide*. The direct support to Can Tho will be used as a showcase to facilitate knowledge sharing and vision development at national level. Government agencies at central level and

other provinces will be involved in sharing experience, lessons learned from the pilot in Can Tho so that to maximize impacts on disaster-linked SP system strengthening in other provinces and at national level.

85. Lastly, the outputs of a fiscal disaster risk profile conducted under this component will inform governments of potential public spending needs in the short and medium term. This will ensure adequate financial resources are immediately available in the aftermath of a disaster to finance the disaster responsive safety net, as well as the reconstruction of public infrastructure and low-income housing, without compromising existing budgetary plans and approved public programs.

Annex 3: Implementation Arrangements

VIETNAM: Can Tho Urban Development and Resilience Project

Project Institutional and Implementation Arrangements

1. The project will be implemented by the Overseas Development Assistance (ODA) Project Management Unit (PMU). This core PMU comprises the PMU team that is currently implementing the Mekong Delta Region Urban Upgrading Project (VUUP 2). Following the closure of VUUP 1 on December 31, 2014, the staff member from that project's PMU have also been moved into the ODA PMU. This Can Tho ODA PMU will be responsible for overall coordination, quality assurance, procurement, financial management, monitoring and reporting, and day-to-day supervision of project activities. Such a consolidation is an advantage for the new project considering that the fiduciary teams of VUUP1 and VUUP2 have an accumulated project implementation experience of 10 years and 3 years, respectively.

2. With regards to technical and engineering expertise, additional capacity will be added from the existing VUUP 1 and 2 teams. This is necessary because VUUP 1 and 2 focused on smaller scale infrastructure interventions, such as tertiary canal dredging and drainage/ wastewater network upgrading. Under the new project, the infrastructure to be constructed is more complex flood risk management investments and sanitation improvements. In addition to additional engineering expertise in the PMU, the Bank team will support the PMU to prepare project documents when complex technical flood risk management and sanitation issues are concerned.

Project administration mechanisms

3. Can Tho City PC is the managing agency; the ODA PMU of Can Tho City, being a subordinate agency of the City People's Committee, plays the role as the Project Owner.

4. A Project Steering Committee, chaired by the Vice Chairwoman of Can Tho, was established to provide strategic direction and oversight for the preparation of the project. The committee includes representation from all related departments of the city. Its members are leaders from the city's departments such as Planning and Investment, Finance, Construction, Transport, Agriculture and Rural Development, Labor and Social Affairs, Environment and Natural Resources and districts' people committee. Given its mandate to help facilitate coordination, a representative from the Climate Change Coordination Office is included in the committee. After the Loan Agreement is approved and the loan is provided, the government will decentralize the loan for CPC to use. The CPC will provide counterpart funds for the project and ensure that the relevant line departments are complying with obligations as stipulated in the Loan Agreement.

5. **City-level implementing mechanism and relationship between agencies.** The Managing agency, Project Owner, Project Management Unit, contractors, donor, and other relevant parties involved in project implementation are listed below.

- Managing agency: Can Tho City People's Committee;
- Project Owner: ODA Project Management Unit, Can Tho City;

- Donor: World Bank

- Contractors: those bidding on public works and technical assistance contracts.

6. The Government of Vietnam will assign Can Tho City People's Committee to manage the loan. The City PC will assign the ODA PMU of Can Tho City to play the role of Project Owner and will assign the loan to the Project Owner to implement the project.

7. **National-level working mechanism between line ministries in project management.** The government of Vietnam, through Prime Minister (PM), will manage all ministries and governmental agencies with specific tasks:

- Ministry of Planning and Investment is the focal agencies to help PM to gather comments from related line ministries and local government, to strengthen and submit Project Investment Reports, investment plans, and annual capital disbursement plan to the PM for approval.

- Ministry of Finance is responsible to issue Guideline for Project financing mechanism before signing the Financing Agreement. The Ministry of finance will inspect, review, and agree in writing to allow withdrawals from donors to cover project implementation costs as required by Project Owner. The Ministry of Finance will assume responsibility, monitor, and approve investment capital settlement to balance investments after project is completed.

- The State Bank of Vietnam will be on behalf of the government, to negotiate and sign the Financing Agreement and related legal documents with the Bank.

- Ministry of Construction will use all of its functions and roles in sectoral management to review technical issues of all project components and will directly support the city with non-structural solutions. This Ministry will be the responsible agency to appraise the Basic Design and other verifications of the project.

- Ministry of Agriculture and Rural Development, Ministry of Transport, and other related line ministries will use all of their functions and roles in sectoral management to review technical issues of all project components and will directly support the city with non-structural solutions.

- Ministry of Labor, Invalids and Social Affairs, and other related line ministries will use all of their functions and roles in sectoral management to review technical issues and will directly support the city with social assistance issues of the project.

- Ministry of Natural Resources and Environment will review the environmental issues of the project.

Financial Management, Disbursements, and Procurement

8. The ODA PMU represents the managing agency to invest and implement, perform and comply with provision of the law on the functions of Project Owner. It will be responsible for financial management, disbursements, and procurement.

Financial Management (FM)

9. The FM capacity assessment, which is performed for Can Tho ODA Project Management Unit, the project implementing agency has been conducted and following key risks were identified: (a) Can Tho ODA PMU is a new entity with an objective to mobilize all of the resources, including the finance and accounting staff to implement the finance and accounting function of the newly established ODA PMU. However, there is not clear structure organization of the new PMU, including the accounting function in management of different ODA projects; (b) successful project implementation requires strong linkages among project components and good management and coordination between the PPC, related government agencies and the PMU. The assessment was conducted through discussions with appointed accountants and noted that FM capacity of the implementing agency is varied.

10. Can Tho ODA PMU has experience mainly in implementing Vietnam Urban Upgrading in Mekong Delta Region. Since the VUUP 1 was closed on December 31, 2014, the staffing resources, including the project chief accountant have been mobilized to work for the ODA PMU and for the new project. With an officially appointed chief accountant of Can Tho ODA PMU and more FM and disbursement trainings provided to accounting staff, the project has adequate financial management staff capacity. The budgeting procedures and practices, accounting system including accounting policies, and internal controls procedures of the PMU is adequate for project financial management.

11. **Staffing.** The PMU has adequate financial management staff capacity. The PMU has experience in implementing World Bank funded investment projects and the financial management of these projects has been satisfactory or moderately satisfactory maintained.

12. **Budgeting.** Budgeting procedures and practices are adequate for the purpose of project financial management. For this project, the annual disbursement plan will be prepared by the FM/ Accounting function which is linked with the physical work plan and procurement plan completed by the PMU. This plan will then be approved by the PMU management and relevant government agencies.

13. **Counterpart Funds.** The overall budget for the project will be approved by Can Tho PPC. The counterpart funds will be made available for the PMU through the State Treasury system. PMU will open counterpart fund accounts at the State Treasury at the same geographical locations, and payments to contractors/ suppliers will be made upon State Treasury verification approval of the payment claims.

14. **Accounting.** PMU will apply government accounting system for investment owner, following Decision 195 of Ministry of Finance. The accounting system, including the accounting policies, procedures and software of PMU, are adequate for project FM. PMU is going to select relevant project accounting software for the proposed project, and training has been delivered for all FM staff.

15. **Internal Controls.** The project's internal controls are documented in a Financial Management Manual (FMM) which was reviewed by the Bank and will be updated regularly to take into account any changes in procedures. The FMM must be reviewed annually to ensure it is up-to-date and relevant.

16. **Internal Audit.** An internal audit function will be established within Can Tho ODA PMU. Internal auditor will be responsible for internal auditing which includes monitoring and supervision of all project activities including the key ones such as budgeting and planning, procurement and financial management. Internal audit activities will be performed twice a year and internal audit reports will be submitted to PPC, Project Steering Committees, related agencies and to the Bank within 3 months after the internal audit periods.

17. **Specific Measures to Reduce Fraud and Corruption.** Contract management will be performed by PMU to avoid overpayment and overrunning contract budgetary allocations. The contract management will form part of the Interim Financial Reporting. To continue to strengthen the financial management arrangements for the project and to help further reduce the risk of fraud and corruption, particular emphasis during preparation has been given to the financial management arrangements in the following areas: (a) clear FM responsibilities with avoidance of gaps and overlaps and maintenance of segregation of duties of FM personnel included in the FM Manual; (b) construction performance audit; and (c) enhanced disclosure and transparency of financial information. The audited financial statements of the projects (prepared under an accounting basis acceptable to the Bank) will be audited in accordance with international auditing standards and consistent with an Audit TOR acceptable to the Bank. In addition, the project audited financial statements will be made publicly available.

18. **Impact of Procurement Arrangements.** Procurement procedures for goods and consultant services will be in line with Bank Guidelines. This feature has been considered when designing Financial Management arrangements.

19. **Financial Reporting.** Semiannual Interim Financial Reports (IFRs) will be prepared by PMU for monitoring of financial performance of the project in a format agreed between the representatives of the GoV and the Bank. PMU will use the Aligned Monitoring Tool (AMT) which is acceptable to the Bank and the Ministry of Planning and Investment. The IFRs are not required to be audited and will be submitted to the Bank within 45 days after the reporting period.

20. **Audit Arrangement.** Financial statements for the project will be prepared by PMU annually. The project's financial statements will be audited on an annual basis in accordance with international auditing standards and term of reference acceptable to the Bank. The auditors' reports will be made available to the Bank within six months of the close of each fiscal year. The project's audited financial statements will be published according to the Bank's information disclosure policy.

21. **Disbursement Arrangements.** The project will use the following disbursement methods (a) reimbursement: the Bank may reimburse the borrower for expenditures eligible for financing pursuant to the Credit Agreement and Loan Agreement "eligible expenditures" that the borrower has pre-financed from its own resources; (b) advance: the Bank may advance loan proceeds into a designated account of the borrower to finance eligible expenditures as they are incurred and for

which supporting documents will be provided at a later date; (c) direct payment: the Bank may make payments, at the borrower's request, directly to a third party (for example, supplier, contractor, and consultant) for eligible expenditures; and (d) special commitment: the Bank may pay amounts to a third party for eligible expenditures under special commitments entered into, in writing, at the borrower's request and on terms and conditions agreed between the Bank and the borrower.

Funds Flow Arrangements

22. One Designated Account (DA) will be opened in USD in a commercial bank to receive funds from both IBRD and IDA, with terms and conditions satisfactory to the Bank. The Bank's disbursements to the project will be report-based, i.e. based on the interim financial reports (IFRs), and initial advances to the DA may be front-loaded based on the forecast of the first two quarters' expenditures expected to be paid out of the funds in the DA, as provided in the IFRs. The DA will be subsequently replenished on a quarterly basis on the basis of actual expenditures incurred and forecast for the following two quarters. For withdrawal outside the designated account (i.e. applications for direct payment or for issuance of special commitments, or reimbursement), a minimum application value of US$100,000 will be observed. Supporting documentation required for documenting expenditures paid from the DA and for reimbursement will be based on IFRs. The frequency for documenting expenditures paid from the DA's will be quarterly. Direct Payments will be documented by records, such as copies of receipts or supplier's invoices, etc. Further details are available in the disbursement letter.

23. Disbursements from IBRD and IDA will be made against the expenditures incurred under respective project components. The Bank financing for the project (both IBRD loan and IDA credit) will be at 100%, inclusive of taxes, as stipulated in the table below. Counterpart funds of $62 million will finance project activities that are not to be financed by the Bank or SECO (co-financing subcomponent 1.3, 2.2, 2,3, 3.1 and 3.2), such as project preparation and management (about $12.9 million), site clearance and resettlement costs (about $44.6 million) and related VAT or contingencies (about $4.6 million).

Category	Amount of the Loan Allocated (expressed in USD)	Amount of the Credit Allocated (expressed in USD equivalent)	Percentage of Expenditures to be financed (inclusive of Taxes)
(1) Goods, Works, Non-Consulting Services, Consultants' Services, Training and Workshops and Incremental Operating Costs of the Project, except Parts 1(iii), 2(iii) and 3 defined in the Loan Agreement	123,847,500	125,000,000	100%

(2) Front-end Fee	312,500		Amount payable pursuant to Section 2.03 of this Agreement in accordance with Section 2.07 (b) of the General Conditions
(3) Commitment Charge	840,000		Amount payable pursuant to Section 2.04 of this Agreement in accordance with Section 3.01(b)of the General Conditions
TOTAL AMOUNT	125,000,000	125,000,000	

24. The project will have a Disbursement Deadline Date (final date on which the Bank will accept applications for withdrawal from the borrower or documentation on the use of loan/credit/grant proceeds already advanced by the Bank) four months after the Closing Date. This "Grace Period" is granted in order to permit the orderly project completion and closure of loan/credit/grant accounts via the submission of applications and supporting documentation for expenditures incurred on or before the Closing Date. Expenditures incurred between the Closing Date and the Disbursement Deadline Date are not eligible for disbursement.

Procurement

25. *General:* Procurement under the project will be carried out in accordance with the Bank's *"Guidelines: Procurement of Goods, Works, and Non-Consulting Services under IBRD Loans and IDA Credits & Grants by World Bank Borrowers" dated January 2011 and revised July 2014* (hereafter called Procurement Guidelines) and *"Guidelines: Selection and Employment of Consultants under IBRD Loans and IDA Credits & Grants by World Bank Borrowers" dated January 2011 and revised July 2014* (hereafter called Consultant Guidelines), as well as the specific provisions stipulated in the Financing Agreement. The procedure to be followed for National Competitive Bidding (NCB) shall be in accordance with provisions stipulated in Annex to Schedule 2 of the Financing Agreement (normally referred to as "NCB Annex"). In the case of any conflict between the Financing Agreement and national laws/regulations, the Financing Agreement takes precedence.

26. *Procurement Risk Assessment and Rating:* PMU under Can Tho PPC is the designated agency for implementing all procurement activities under this project. PMU is an experienced project management unit and has implemented a number of urban upgrading construction projects financed by the GOV funding as well as a couple of projects financed by the Bank (referred as VUUP 1 and 2). The procurement unit as currently established under PMU includes several staff who had previous procurement experience under VUUP1 & 2. The procurement risk and capacity assessment identified several risks in the following areas that would cause substantial delays in project implementation, possible irregularities and noncompliance in procurement process, and potential fraud and corruption:

- Cumbersome and protracted Government procedures for internal reviews and approval of procurement actions; lack of transparency and accountability;
- Tendency of the PMU and relevant appraising & approving authorities to follow the Government procurement rules and procedures rather than the Bank Guidelines; unjustified rejection of bids based on minor deviations;
- Inadequate capacity & competence of PMU and Government staff in procurement planning, preparing procurement related documents, and inadequate contract supervision and management, especially for large contracts;
- Potential collusion among bidders.

27. Given the above findings and also considering the level of complexity of procurement under the project, the procurement risk for this project has been assessed as Substantial.

28. *Mitigation measures:* Measures to mitigate the identified risks have been discussed and agreed with the PMU as described below. It is expected to downgrade the residual procurement risk rating to "Moderate", after the mitigation measures are implemented.

Table 3.1. Procurement Risk Mitigation Measures

No.	Actions	Agency	Time frame
1	Prepare, finalize, and adopt a project POM, including a detailed procurement section (clear rules, procedures and division of responsibilities, timeline requirements for procurement activities, actions and decisions, sample documents and evaluation report for small procurements, an effective complaint handling mechanism, full decentralization and empowerment to the PMU, as well as a code of conduct).	PMU	Approved in February 2016
2	Hiring national procurement consultants to support the PMU	PMU	During project preparation and throughout project procurement implementation period
3	Intensive training on procurement, contract management and anti-fraud and corruption for PMU staff	Bank/ PMU	Throughout implementation
4	Requesting bid evaluators to sign and execute a Transparency and Ethics Statement when carrying out their duties	PMU	Throughout project procurement implementation period
5	Employing qualified international consulting firms for construction and contract management	PMU	Supervision consultants for Component 1 and 2 hired by Oct. 2016;
6	Carry out regular implementation support missions and annual procurement post review.	Bank/ PMU	Implementation
7	Establish / operate / manage an appropriate procurement record keeping and monitoring system (including adequate storage).	PMU	Implementation

29. *Procurement Plan:* The PMU has developed an acceptable procurement plan for the initial 18 months of project implementation. The various items under different expenditure categories are described/summarized below in Table 3.2. The procurement plan includes contracts that are to be

awarded under advance procurement is presented in Table 3.3; all such contracts, irrespective of value, are subject to prior review. The Procurement Plan shall be updated annually or as needed. All the Procurement Plans and their updates will be published on the Bank's external website in accordance with the Guidelines as well as the Government's Public Procurement Review.

Table 3.2. Summary of Initial 18 months Procurement Plan

Ref. No	Description	Estimated Cost (US$, millions)	No. of Packages	Review by the Bank (Prior/Post)	Comments (Prior Review Contract)
1	Summary of the ICB (Works) packages	21.911	1	Prior	
2	Summary of the NCB (Works) packages	119.120	11	Prior/Post	Prior review the first 2 contract(s)
3	Summary of number of contract ≥ US$0.3 million that will be let under QCBS	5.910	5	Prior	
4	Summary of number of contracts < US$0.3 million that will be let under CQS, LCS	1.040	5	Prior/Post	Prior review the first 2 contract
	Total	**147.819**	**22**		

Table 3.3: Procurement Plan for Advance Procurement Activities

Contract No.	Description	Estimated Cost (US$ million)	Procurement Method	Review by Bank	Expected Bid Opening
CT3-CS-TV1	Consultant supervision and contract management for Can Tho River Revetment	1.253	QCBS	Prior	Feb.-16
CT3-CS-TV2	Consultant supervision and contract management for civil works of Component 2	2.407	QCBS	Prior	Feb-16
CT3-CS-TV3	Consultant supervision and contract management for construction of An Binh resettlement area phase 1	0.290	CQS	Prior	Jan.-16
CT3-PW-2.7	Construction of An Binh resettlement area phase 1	8.539	NCB	Prior	Jan.-16

30. **Procurement Supervision and Post-review.** Contracts not subject to the Bank's prior review will be subject to post-review as per procedures set forth in paragraph 5 of Appendix 1 of the Procurement Guidelines and Consultant Guidelines. The rate of post review will initially be 20 percent. This rate will be adjusted periodically based on procurement performance. The PMU will send to the Bank, on a biannual basis, a list of all awarded contracts for goods, works, and consultants' services that are subject to post-review.

83. **Procurement Thresholds and Bank's Prior Review.** The thresholds for procurement methods and Bank prior review are presented in Table 3.4, below. These thresholds may be updated and adjusted as needed.

Table 3.43. Procurement Method and Prior Review Thresholds

Category	Procurement Method Thresholds		Prior Review Thresholds	
	Applicable thresholds (in US$, millions)	**Remarks**	**Applicable thresholds (in US$, millions)**	**Remarks**
Works / Supply and Installation				
ICB	**≥ 20.0**	–	**All ICB contracts**	–
NCB	**< 20.0**	–	**Above US$15 million and first two NCB contracts (value ≥ 0.2 and < 20.0)**	Risk-based approach (according to procurement risk rating)
Shopping	**< 0.2**	–	**None**	–
Goods				
ICB	**≥ 3.0**	–	**All contracts**	–
NCB	**< 3.0**	Where goods are not normally available from within Vietnam, the method of procurement will be ICB even if the contract value is less than US$1 million.	**First two NCB contracts (value ≥ 0.1 and < 3)**	Risk-based approach (according to procurement risk rating)
Shopping	**< 0.1**		None	
Consultant Services				
CQS	**< 0.3**	Para 3.7 of Consultant Guidelines (January 2011). Other methods (QCBS, QBS, FBS, LCS) may also be applied for contracts below US$0.3 million.	• **Firms**: **≥ 0.3** (for competitive selection) **plus the first contract for each method (QCBS, QBS, FBS, and LCS) regardless of value.** • **SSS:** For SSS, US$50,000 (Para 3.9 of Consultant Guidelines, January 2011) and all other SSS contracts. • **Individuals**: **for essential assignments** (procurement consultant, accountant). For SSS, US$20,000 (Para 5.6 of Consultant Guidelines, January 2011)	All QCBS contracts ≥ US$0.3 million shall be subject to Prior review. Essential individual assignments will be defined in the Procurement Plan agreed with the Bank.

Environmental and Social (including safeguards)

31. OP/BP 4.01 is triggered and the project is classified as a Category A due to the potentially significant and potentially irreversible environmental and social impacts associated with project interventions, although the social impacts due to relocation of over one thousand households have a greater impact than the temporary environmental impacts caused by construction activities, which effects will be mitigated by appropriate mitigation measures. The significant environmental impacts are largely positive, as flood risk management investments and the rehabilitation and

improvement of canal, drainage and sanitation infrastructure will greatly reduce the pollution load on the Can Tho and Hau Rivers, with resultant significant benefits to community health and safety.

32. A social assessment (SA) was conducted as a part of the Environmental and Social Impact Assessment (ESIA) during project preparation The ESIA showed that the project is expected to have positive social impacts by reducing flood to improve sanitation, living and working environment of the people as well as to increase income earning possibility and asset value of the beneficiaries. The only adverse impact relates to the need of acquiring land for the project investment. Recommendations arising from the ESIA have been taken into account in project design toward minimizing adverse impact of the flooding on local people in general and on vulnerable groups like the poor, migrants and disable people, in particular.

33. A Social Management Plan (SMP), derived from SA recommendations, will be combined with EMP to become ESMP with specific actions to be implemented during project implementation, including a communication strategy to raise awareness of the local people and their preparedness to better cope with flooding and climate change situation. In addition, a social protection subcomponent has been established to help vulnerable people better manage the risks and shocks caused by flooding.

34. **Involuntary Resettlement.** According to the list of the proposed investments of the project Component 1 and 2, land acquisition of about 135.4 ha would affect 4,539 households (about 17,700 persons), of which 1,814 would need to be relocated; 826 would lose more than 20 percent of their agricultural land and 709 would have business affected. Therefore, OP/BP 4.12 will be triggered for this project. A Resettlement Policy Framework has been prepared to comply with the Bank OP 4.12 to serve as a legal basis for compensation and resettlement activities of the project (as required by the Land Law). Changes in design may also occur during detailed design and construction. The RPF will guide the preparation of resettlement documents in case of change of design. As all the project activities are known during project preparation, a Resettlement Plan (RP) was developed to be in line with the prepared RPF. The RP will have to be updated if there are substantial changes in the project design and/or in the scope of the project impact during project implementation. The revised RPF or RAP will require resubmission and approval by the Bank.

35. There is an on-going compensation and resettlement activities for the government funded Can Tho River embankment project (started in 2008) in Ninh Kieu District, the civil work of which will be included in the proposed CTUDR. By the pre-appraisal mission time, 381 out of 580 affected households (about 66 percent) have received the compensation payment during 2012–2015. A due diligence review of compensation and resettlement activities for these HHs was conducted to identify the gaps between the applied and the proposed project policies to determine additional measures to fill in the gaps. The review results with proposed additional compensation and resettlement measures for these affected households have been added in the draft RP (Annex 12) to be monitored both internally and externally during the project implementation.

36. The city has agreed to use the proposed RPF and RP for CTUDR in conducting land acquisition in advance for the project resettlement site to meet relocation needs of the affected people in a timely manner. A due diligence review will be conducted for compensation and resettlement activities once the CTUDR RPF/RP will have been approved to ensure the project policies are properly applied for the resettlement site land acquisition activities.

37. The screening of linked activities showed that there are three linked projects, two of which were reviewed (in 2011–2012) during preparation of the Bank-funded Mekong Delta Region Urban Upgrading project (MDR-UUP) and the due diligence review results had showed that there were no outstanding issues and no further actions were required. The third one is MDR-UUP itself, all land acquisition activities of which have followed the agreed RPF and RP of the project, so no further action will be needed.

38. **Independent Asset Valuation.** The PMU will engage professional asset valuators during RP implementation to conduct an asset market price survey to be the basis for compensation rates at full replacement value.

39. **Resettlement Location.** A resettlement site of about 54.5 ha in Ninh Kieu District will be developed to accommodate the needs of relocated households, most of which currently live in Ninh Kieu District. In addition, more options of utilizing the available residential land plots in the city will be provided to the affected people.

40. **Independent Resettlement Monitoring.** The PMU will contract an experienced independent resettlement monitoring agency (IMA) for external monitoring of RP implementation. The IMA will submit biannual reports to the PMU and to the Bank. The IMA will also conduct an evaluation of resettlement implementation 6–12 months after the completion of all resettlement activities. Additional assistance will be provided to those who would not be able to restore the lost assets and livelihood.

41. **Grievances Redress Mechanisms (GRM).** The RP describes the procedures and responsibility of related agencies in receiving, redressing and recording all grievances and complaints from the DPs and their resolutions. Project-affected people will be provided information on the GRM and related agencies in charge of solving project complaints on land, assets acquisition, physical relocation, and income restoration.

42. **Implementation Arrangements.** The PMU, in collaboration with district authorities and related city agencies and supported by the city, will assume overall responsibility for RP implementation. The City PC will give final approval for land acquisition, allocation, and compensation rates. Compensation and land acquisition costs will be financed by counterpart funds. The PMU has good experience in working with the Bank-funded projects and are familiar with the Bank policy and requirements. Training on social safeguard policy and requirements will also be provided to the PMU staff and key local authorities during project implementation. To facilitate effective implementation of the ESMP, the PMU will: (a) Establish an Environment and Social Unit (ESU) responsible for ensuring timely implementation of the ESMP, including monitoring, reporting, and capacity building related to safeguards; (b) Assign the Construction Supervision Consultant (CSC) to also be responsible for supervision of the contractor's safeguard performance as part of the construction contract and this requirement will be included in the CSC's terms of reference; and (c) Hire qualified national consultants as the Independent Environmental Monitoring Consultant (IEMC) to assist the ESU in performing its task.

43. **Consultation.** Consultations with project-affected households and other stakeholders were carried out during ESIA and RP/RPF preparation. Information on the project's objective, potential impacts, and relevant features of compensation and resettlement policy frameworks, were widely

disseminated and discussed. A similar participatory approach will be pursued during project implementation.

44. **Indigenous Peoples OP/BP 4.10**: The surveys prepared for the RP and for the SA conducted by the third party indicated that there are 11 HH belonging to ethnic minorities affected by the Project. However these HH are urbanized and integrated into the urban mainstream way of life. This has considerably reduced their relative vulnerability and cultural distinctiveness relative to the dominant Kinh community. The 11 HH are spread in the City and do not comprise an EM community, so OP4.10 is not triggered for this project.

45. **Gender.** The project paid special attention to gender issues during project preparation by involving both men and women the in consultation process. Gender issues will continue to play an important role during project implementation, especially under capacity building and awareness raising activities. Specifically, the ESIA identified a need for increased awareness raising on hygiene, sanitation, and waste disposal issues at the household and community levels. This will be done through Information Education and Communication (IEC) activities (TBC). The sanitation behavior change information will aim to inform women in a household about better sanitation practices that lead to reduced health risks.

46. **OP/BP 4.01 and Project Category.** OP 4.01 is triggered and the project is classified as a category A due to the potentially significant and potentially irreversible environmental and social impacts associated with project interventions under three components, although the social impacts due to relocation of over one thousand households has a greater impact than the temporary and limited environmental impacts caused by construction activities, which effects will be mitigated by appropriate mitigation measures. The significant environmental impacts are largely positive, as flood risk management investments and the rehabilitation and improvement of canal, drainage and sanitation infrastructure will greatly reduce the pollution load on the Can Tho and Hau Rivers, with resultant significant benefits to community health and safety. Component 2 involves priority transport investments, under which about 3 urban roads and 2 bridges will be financed. These potential impacts of these investments are site-specific, and can be managed by good construction practices.

47. The Borrower should also refer to the World Bank Group Environmental Health and Safety Guidelines, which, as well as sector-specific guidelines, provides guidance on best practice occupational and community health and safety procedures: Any dredged material must be tested for Acid Sulfate Soil and be treated and safely disposed of. Furthermore, OP 4.01 applies also to Component 3 investments linked to development of protocols for operating the city flood control and drainage systems in case of emergency; and technical studies on transport management for which TOR will include requirements to follow applicable safeguard provisions.

48. **OP/BP 4.04. Natural Habitats.** The project interventions under Components 1 and 2 include strengthening and construction of river embankments, construction of tidal sluice gates, canal dredging, and extension of the sewage system, bridge construction. These project activities would only minimally impact the ecological flow of the Can Tho and Hau Rivers, and it is worth noting that there is already a high level of human intervention due to the urbanized nature of the project area. Hydrological modeling will be undertaken to limit seasonal impacts on aquatic fauna as far as possible. Efforts will be taken to limit impacts on aquatic fauna, for example, through the

placement of fish ladders at the proposed sluice gates. Therefore, OP 4.04 - Natural Habitats is triggered.

49. As a result of the hydraulic calculation for the Overall Irrigation Masterplan under Climate Change-Sea Level Rising conditions during rainy season, the impacts of the increase in sea tides and upstream flow are quite serious for the flooding conditions of MDR, by 2020, flooding level in the tide-affected area is quite high (at Can Tho station, the maximum water level is about +2.20 m). By 2050, flooding level will increase significantly, most of the tide-affected are of MDR will be deeply flooded from 0.5–1.7 m if there is no protection structures. The increase in water level at the flooding area should be accepted and adapted (the elevation of infrastructure should be increased in response to the increased water level) in all options. In the tidal flooding areas, control of the increasing water level should be done in all options, by 2050, when the water level increased from 25–40 cm, tide control structures placed in appropriate locations will improve the tidal flooding situation.

50. According to the Irrigation and Flood Control Masterplan of Can Tho City, due to being located in low-lying areas (typical elevation from +0.6 ÷ +1.2 m, maximum in the city center is about +2.2 m; when the maximum tide level can reach +2.1 ÷ +2.2 m) so even in the absence of rain, most of the area is flooded by the combination of tide and floods. Common flood depths are from +0.5 ÷ +1.5 m (in 90 percent of the total area). Hydraulic calculation results in case of high tide level, max water level of the present situation scenario in Binh Thuy-Ninh Kieu area is +2.03 m, max water level in the urban core is also at +2.03 m. Thus, when the flood protection system is constructed along the primary canals, water level at the main outlets of the urban drainage system will not change much in comparison with the current situation, therefore it will not result in increasing water levels in surrounding areas, as well as it can significantly reduce the heights of the embankments, pumping water heads and landfill elevation.

51. **OP/BP 4.11 - Physical Cultural Resources.** Preliminary site screening has not identified any physical cultural resources in the project location that could be potentially affected by the project. However, the presence of any cultural, historic, or religious monuments, or graves will be assessed during project preparation as part of EA project. The policy is triggered as the project includes dredging and excavation activities under Components 1 and 2, which may result in chance finds, for which a chance finds procedure has been delineated in the ESIA.

52. **OP 7.50 - Projects on International Waterways.** The project triggers OP 7.50 as the interventions in Component 1 are located in a tributary of the Mekong River, the Can Tho River, and a river further inland – the Cai Son River. However, the proposed investments are river bank embankment works on existing schemes to protect the core urban area from fluvial and tidal flooding, and prevent river bank erosion. A combined system of roads, embankments, and tidal gates along the Can Tho and Cai Son rivers and tidal gates will protect the core urban area from river and tidal flooding. According to the hydraulic analysis, the water level in the Can Tho river will be very minimally affected (less than 1mm of increase), and there will be no more than 5mm increase in water level in the surrounding areas.

53. The project will upgrade, improve, or rehabilitate existing urban schemes for storm-water drainage, wastewater sewerage, and canal embankments. Given the general scope of work, (i) the project will not adversely affect the quality and quantity of water flows to the other riparians and

(ii.) it will not be adversely affected by other riparians' possible water use. According to the hydraulic analysis, the water level in the Can Tho river will be very minimally affected (less than 1mm of increase), and there will be no more than 5mm increase in water level in the surrounding areas. It is the Task Team's determination that the exception to the riparian notification under paragraph 7(a) applies to the project. In addition, considering that (i) the interventions in Component 1 are located in a tributary of the Hau (Mekong) River - the Can Tho River, which runs exclusively in Vietnam - and a river further inland which also runs exclusively in Vietnam – the Cai Son River, and do not harm to the natural discharge flow of neither Hau nor its tributaries of Can Tho and Cai Son rivers; and (ii) the project does not cause appreciable harm to other states, it is the Task Team's determination that the exception to the riparian notification under paragraph 7(c) also applies to the project. Based on the foregoing, the Task Team has received approval from the Regional Vice President for exception to the riparian notification requirements under paragraphs 7(a) and 7(c) of OP 7.50.

54. **Role of Partners.** SECO is a key partner for the proposed project and has been working in close partnership with the Bank team and the City since the Concept Review. As a result of this partnership, SECO has agreed to provide US$10 million in grant financing. This funding is particularly important in light of the current hesitation by the Government of Vietnam to borrow for non-structural investments. Grant funding from SECO will support the development the urban resilience systems, which complement the structural investments financed by the World Bank, will significantly strengthen the impact, sustainability and longer term resilient urban development approach undertaken by the City.

55. SECO financing will be separated into two main categories, Bank-executed and Recipient executed, with funding divided about evenly between each part. The World Bank will oversee the initial setup and implementation of the more technical activities that require recruitment of highly specialized experts, while the City is responsible for the operations and maintenance of these activities. The SECO funds are expected to be delivered by May 2016.

56. The Bank and SECO teams will undertake project implementation support and supervision. Bank's task team has experiences with preparation of urban transport/BRT projects in Hanoi, HCMC and Da Nang. The implementation support plan will consists of scheduled full supervision missions every six months, short review missions focusing on problem solving, as well as timely day-to-day technical support as necessary.

Annex 4: Implementation Support Plan

Vietnam: Can Tho Urban Development and Resilience Project

1. The Implementation Support Plan (ISP) for the project is developed based on the specific nature of the components, the planned implementation schedule, lessons learned from similar projects in the sector, and specific needs as identified by the respective assessments. The plan will be regularly reviewed and revised as required.

2. The ISP includes frequent review of implementation performance and progress. The Bank's team will monitor implementation through (a) reporting of key performance indicators as defined in the Results Framework; (b) independent verification of project activities through field visits and documentation review; (c) proper fiduciary management of all activities carried out by the PMU; (d) spot supervision of works on the ground, and (e) regular communication with the PMU.

3. Information from various sources will be used to assess and monitor implementation progress. In addition to the data generated through the project's M&E system, the Bank will also review the findings and results of third party assessments and environmental and social audits as well as the grievance redress mechanism. In addition, and as required, targeted support including short missions by subject matter experts will be carried out.

4. The Bank's procurement, financial management, and environmental and social safeguards specialists will also provide timely and effective implementation support, and in addition to carrying out an annual ex-post review of procurement that falls below the prior review thresholds, the procurement specialist will lead procurement focused missions depending on the needs and as agreed to with the PMU. The financial management specialist will review all financial management reports and audits and take necessary follow-up actions as per the Bank procedures. These team members will also help identify capacity building needs to strengthen procurement and financial management capacity. Semiannual inputs from the environmental and social specialists will be required throughout the project, and formal supervision missions and field visits will monitor the implementation of the ESMF and RPF in accordance with the Bank safeguard policies, and suggest any corrective measures as necessary.

5. The following ISP reflects the preliminary estimates of the skill, timing, and resource requirements over the implementation period of the project. Keeping in mind the need to maintain flexibility over project activities from year to year, the ISP will be reviewed from time to time to ensure that it continues to meet the implementation support needs of the project.

6. The key areas in this project where implementation support is particularly required are related to technical, social and fiduciary support. With regards to technical support, significant resources will be made available through the SECO support that will enable a wide range of experts to implement Component 3 of the project. The consultants to be supported with the SECO funding have particular experience in: i) flood risk management; ii) geospatial platform development and data sharing protocols; iii) community mapping; iv) disaster risk financing and insurance; and v) social protection. With regards to social, an important risk to be mitigated by technical expertise is the resettlement effort, including the development of the resettlement site and payment of

resettlement support to beneficiaries. With regards to fiduciary support, consultants will guide the PMU in the development of the financial reports in accordance to Bank guidelines. More importantly, technical expertise in engineering design will be delivered to the PMU throughout the procurement process for the large infrastructure works.

7. In addition, the team will work in taking advantage of opportunities for cross-learning, combining external expertise, and carrying out joint missions with ongoing Bank projects as well as with other development partners.

Implementation Support Plan

Table 4.1. Skills and Resource Requirements

Time (months)	Focus	Skills Needed	Resource Estimate (Staff Weeks)
First six	Technical review of procurement bidding documents	Building Engineer	3
		Procurement Specialist	2
	Technical review of TA documents	Technical Specialists	4
	Environmental Monitoring	Environmental Specialist	2
	Resettlement Monitoring	Social Specialist	3
	Review of financial management	Financial Specialist	1
	Implementation Support	ACS	4
	Team Leadership	TTL	10
Six-36	Project Construction	Building Engineer	6
	Technical Reviews of TA Outputs	Technical Specialists	5
	Environmental Monitoring	Environ. Specialist	5
	Resettlement Monitoring	Social Specialist	4
	Review of procurement documents	Procurement Specialist	8
	Review of financial management	Financial Specialist	3
	Implementation Support	ACS	12
	Team Leadership	TTL	36

Table 4.2. World Bank Skills Mix Required

Skills Needed	Number of Staff Weeks	Number of Trips	Comments
Team Leadership	46	10	
Environmental Specialist	7	6	
Financial Specialist	4	4	
Building Engineer	8	6	
Implementation Support	16	2	
Procurement Specialist	12	3	
Social Specialist	9	6	
Technical Specialists	13	5	In various disciplines (DRM, Transport, Energy, Agriculture, Water)