

PROJECT INFORMATION DOCUMENT (PID) CONCEPT STAGE

Report No.: PIDC7777

Project Name	HCMC Flood Risk Management (P149696)
Region	EAST ASIA AND PACIFIC
Country	Vietnam
Sector(s)	Flood protection (60%), Sanitation (40%)
Theme(s)	Natural disaster management (50%), Environmental policies and institutions (30%), Other urban development (20%)
Lending Instrument	Investment Project Financing
Project ID	P149696
Borrower(s)	Socialist Republic of Vietnam
Implementing Agency	HCMC Steering Center for the Flood Control Program
Environmental Category	A-Full Assessment
Date PID Prepared/ Updated	27-Jan-2015
Date PID Approved/ Disclosed	25-Feb-2015
Estimated Date of Appraisal Completion	18-Dec-2015
Estimated Date of Board Approval	15-Apr-2016
Concept Review Decision	Track II - The review did authorize the preparation to continue

I. Introduction and Context

Country Context

1. Vietnam has made remarkable progress in economic growth and poverty in recent years, and has recently graduated to lower middle income country status. Over the last two decades, the country has recorded among the highest growth rates in the world, which in turn enabled poverty reduction at record pace. GDP growth, however, fell from an average rate of 7.3 percent during 2000-07 to 5.8 percent during 2008-2012, and down to around 5.3 percent in 2013. The external sector has held up well despite the global situation, but domestic demand remains weak on account of subdued private sector confidence, overleveraged SOE and (undercapitalized) banking sectors, and shrinking fiscal space. The slowing of the growth rate has had limited impact in large cities which continues to attract domestic and foreign investment.

2. An integral part of Vietnam's transition from low- middle income to advanced status has been its transition from a largely rural to urban economy. The country's economic progress has

coincided with rapid urbanization, with Vietnam sustaining a 3 percent annual urban population growth rate from 1999 to 2011. The urban population is currently 32 percent of the total population and is expected to reach 40 percent by 2020. Most of the country's urban and economic growth over the past ten years has been concentrated in Hanoi and Ho Chi Minh City (HCMC) and their economic regions. Of the two, HCMC is the larger city with a population of approximately 7.7 million, accounting for 20 percent of national GDP, 23 percent of the urban population and 45 percent of the country's manufacturing. The Government of Vietnam (GOV's) 2011-2020 Socio-Economic Development Strategy recognizes that urbanization, especially in these big cities, will be necessary to promote the country's goals of industrialization and modernization.

3. While urbanization has created opportunities for growth, it has also increased the vulnerability of urban residents in the coastal areas: The spatial footprint of HCMC has expanded from 86.2 km² in 1990 to 351.1 km² in 2010 and close to sixty percent of the total land area of HCMC is less than 1.5 meter above sea level(1). HCMC faces perennial flooding issues during the rainy seasons spanning from June to November and during high tidal-peak periods from September to December because of semi-diurnal tide and discharge from Saigon River. The flooding situation is exacerbated by other factors – poor drainage in built-up urban areas, development in low-lying areas due to weak land-use planning, dumping of solid waste in the canal network, excess groundwater extraction in urban areas and insufficient coordination of upstream dam operations. According to recent studies, it is projected that up to 60 percent of the built-up area in HCMC will be exposed to a 100cm sea level rise in the next 20 years. In the absence of adaptation, the planned urban development for the year 2025 further increases Ho Chi Minh City's exposure to sea-level rise by 17 percentage points.(2)

4. Addressing the above mentioned issues is crucial not only to improve the quality of life for urban residents in low-lying urban areas but also to sustain and strengthen economic growth in the manufacturing and tertiary sectors. The economic enterprises in HCMC provide stable employment for long-term and temporary migrants from other provinces and have attracted millions of workers to work in the construction and industrial sectors. It is estimated that close to USD 28.86 billion worth of assets are exposed to changes in climate change(3). Improving the city's resilience to natural disasters is a critical action in the larger goal of reducing extreme poverty.

(1) Hunt and Mandia (2012) Rising Sea Levels, An introduction to Cause and Impact, McFarland and Company, USA

(2) World Bank (2013) 4 degrees, Turn Down the Heat, Climate extremes, regional impacts and the case for Resilience, World Bank Group, Washington DC.

(3) Ibid.

Sectoral and Institutional Context

5. Currently, HCMC's flood protection strategy is guided by the (1) the Flood Management Plan for 2020 HCMC or "Plan 752" or "Japan International Cooperation Agency (JICA) Plan" and; (2) the Water Resources Plan for Flood Control HCMC or "Plan 1547" or "Ministry of Agriculture and Rural Development (MARD) Plan(4)." In addition, the recently issued Prime Minister's Decree 103/TB-VPCP on National Climate Change priority tasks recognizes the importance of improving flood protection systems in HCMC as a key response for climate change.

6. Over the last decade, HCMC has undertaken a number of programs to address flooding issues in three sub-catchments, which is home to a large proportion of the city's population - (a)

Nhieu Loc-Thi Nghe (NLTN); (b) Tau Hu – Doi Te - Ben Nghe (THDTBN); (c) Tan Hoa - Lo Gom (THLG) which altogether cover a population of close to four million inhabitants. With support from the World Bank, Asian Development Bank and the Japanese Government, improvements have been made through interventions in storm water drainage, canal embankment, water supply and wastewater. The interventions have successfully reduced the number of flood hot spots in the above-mentioned sub-catchments from over 100 down to 11 by the end of 2013 in the inner districts of the city.

7. As part of HCMC's phased program for addressing flooding issues, HCMC has proposed to undertake flood protection interventions starting with the remaining sub-catchment in the inner core part of the city, the Tham Luong - Ben Cat (TLBC) sub catchment, and subsequently scale up the approach to include areas on the left bank of the Saigon River such as Thu Thiem, Tu Duc, District 2, Can Gio, District 9. TLBC is currently home to close to two million inhabitants.

8. In HCMC, most of the efforts to date have focused on structural measures and the non-structural measures are not fully integrated in the city's urban planning processes. In terms of urban planning, the current land-use plans in HCMC do not systematically embed integrated flood risk management issues. Furthermore, there is very limited geo-spatial information on flood risk/flood hazard zones and there is no coordinated mechanism for information sharing across city departments.

9. The city also faces serious issues with disposal of solid waste and industrial waste in its canal network. The existing waste disposal practices tend to exacerbate the drainage of storm water during heavy rains, impede the temporary storage of water in the canal network, while also worsen the water quality. While the city has been working closely to address waste disposal in its canal network, enforcement still remains to be very weak.

10. The current institutional landscape for flood risk management is complex with planning and implementation functions spread across several departments, central line ministries and independent agencies. The multiplicity of agencies makes it challenging to effectively plan for and implement flood risk management and associated interventions in HCMC. Furthermore, such a process needs to be embedded in a river-basin approach ensuring effective coordination with upstream reservoir operations and mechanisms for inter-jurisdictional land-use and urban planning.

11. The establishment of HCMC Steering Center for Urban Flood Control Program (SCFC) provides the opportunity to establish a coordinated mechanism for flood risk management and waste water services at the city level with other departments like Department of Transport (DoT), Department of Construction (DoC) and Department of Agriculture and Rural Development (DARD). However, the institutional capacity within SCFC needs to be strengthened in the following areas: (a) be able to coordinate effectively across various departments and ministries including coordination with upstream reservoir operators; (b) be responsible for development and enforcement of flood risk management plan, incorporation of flood risk management in urban development plans and operation and maintenance of the city flood risk management systems (including flood protection, drainage systems, local canals, flood/tidal gates and valves, as well as wastewater operations) and; (c) develop and carry out emergency response plans, including implementation of last-mile early warning system into local communities and, public awareness.

12. The Bank's involvement in the proposed flood risk management project will provide assistance

with an integrated flood risk management approach focusing on: (a) strengthening the capacity of SCFC to better manage flood risk in HCMC and strive towards an internationally recognized institutional model in flood risk management; (b) non-structural measures to integrate the concepts of making room for the water; (c) protecting key assets in selected areas of HCMC; (d) knowledge transfer and sharing experiences from international best practices in flood risk management in large cities through the Urban Floods Community of Practice; (e) donor coordination; and (f) ensuring effective citizen participation in flood risk management.

(4) The JICA plan mainly deals with the urban floods caused by rainfall by improving the efficiency of the city's drainage system for rainfall water. The MARD Plan consist of a set of structural measures (172 km of dikes and 12 gates along the canals that discharge in the Saigon River) along 2 provinces to minimize the flood risks mainly due to rainfall, floods from upstream (Saigon and Dong Nai Rivers) and tidal influx.

Relationship to CAS

13. The proposed project is consistent with the World Bank Country Partnership Strategy (CPS) for 2012-2016 and contributes directly to the "Sustainability" pillar. Furthermore, the proposed project would address the cross cutting theme of "resilience" by increasing the ability of HCMC and its people, economic assets and commercial businesses to withstand the impacts of natural hazards and climate change. This cross-cutting nature of the operation reflects in its direct support to the following CPS outcomes:

Outcome 2.3: Enhanced preparedness for natural hazards and climate change. The project will strengthen capacities of urban integrated flood risk management, including urban planning, institutional coordination, flood forecasting and early warning systems, both at the city and provincial/regional/national levels.

Outcome 3.2: Improved basic infrastructure and public service delivery and access. This project will enhance flood management infrastructure and city's storm water drainage and waste water systems to improve basic public services in selected areas of HCMC. Sanitation and environmental conditions like water quality and solid waste dumping will be complementarily improved by the enhanced flood management infrastructure and city's drainage systems.

14. The proposed project is well aligned with the Bank's new strategy of "twin goals" of eliminating extreme poverty and supporting shared prosperity through economic growth among the bottom forty percent. According to a recent study conducted by the World Bank in the TLBC sub-catchment(5), the districts in the sub-catchment are home to a large migrant population(6) who are particularly vulnerable to flooding as the foundation of their houses are below flood level and they cannot afford any housing repairs or improvements. In addition, a heavily polluted environment caused by flood is contributing to health diseases for residents, such as skin and intestine diseases, rheumatism, bronchitis, and regular coughing amongst children, especially under-fives. In addition, flooding also affects industrial enterprises in terms of productivity loss and inability of workers to attend work during flooding events. Any improvements in the sub-catchment will enhance the quality of life for citizens in HCMC and will also in turn promote productivity of the industrial enterprises.

15. The proposed project is also closely aligned to the 2013 World Bank Urban and Local Government Strategy and the 2010 Strategic Review of Sustaining Water for all in a changing world. Furthermore, the proposed project contributes to the World Bank's Engagement in HCMC

that focuses on an integrated city-wide solutions and a more programmatic approach. The proposed project will leverage findings from three recently completed World Bank's analytical products(7).

(5) World Bank (2014) "Where are we during Flooding" Qualitative Assessment of Poverty and Social Impacts due to Flooding in Select Neighborhoods of HCMC.

(6) Migrants comprise of two sub-groups - one work for factories and another (day laborers) work in the informal sector (such as street vendors, lottery-ticket sellers, shop and restaurant assistants, taxi scooter drivers, cyclo drivers, casual construction workers, vehicle repairers and cleaners).

(7) HCMC Stocktaking Note, Vietnam Urban Wastewater Review and Assessment of the Financing Framework for Municipal Infrastructure in Vietnam

II. Proposed Development Objective(s)

Proposed Development Objective(s) (From PCN)

The proposed Project Development Objective is to reduce flood risk and improve drainage in selected areas in Ho Chi Minh City.

Key Results (From PCN)

17. At the project level, PDO indicators for the proposed project include:

- Land area protected from a 10- year return period flood event as a result of project interventions (ha)
- Number of people provided with access to improved sanitation facilities under the project
- Direct Project Beneficiaries (number) (disaggregated by gender, of which bottom 40 percent)
- Improved perception of stakeholders regarding flood risk management in HCMC (disaggregated by gender)
- Strengthened capacity of HCMC for integrated planning for flood risk management as measured by improved screening processes for investment activities by the People's Committee

18. Intermediate outcome indicators include:

- Length of embankment constructed (km)
- Number of tidal sluice gates constructed
- Primary and secondary combined storm water drainage and wastewater sewage system constructed (km of pipeline)
- Volume of canal dredged (m3)
- Improved water quality in the canal (Volume (m3) of Biological Oxygen Demand (BOD) pollution load removed by investments supported under the project)
- Number of staff trained on the integrated flood risk management
- Number of hydromet stations installed
- Comprehensive Flood Risk information system including web portal established in HCMC

Project Beneficiaries

19. Major beneficiaries of the projects include: (i) city flood risk management system benefiting from new equipment and capacity strengthening activities; (ii) FDI and private enterprises, most of them in industrial zones, which will benefit through improvement in infrastructure and reduced disruption due to flooding; and (iii) about two million people living in the sub-catchment who will benefit from flood control measures and improved sanitation. Of this

population, 5.6% are estimated to be in the bottom 40% of Vietnam's income distribution, and 1.3% is estimated to be poor by the national poverty line of 653,000 VND per person per month in 2010.

III. Preliminary Description

Concept Description

20. The proposed project is part of the World Bank's long-term engagement supporting HCMC's efforts to reduce the overall flooding situation. Given the extensive needs of the city, complexity of addressing flood risk management issues and the limited financing envelope, a two-phased Road Map for Integrated Flood Risk Management is being proposed, with each phase having clear targets for institutional development and infrastructure investments.

Road Map for Integrated Flood Risk Management in HCMC

Institutional Capacity

Year (2016)

- Evaluation of institutional fragmentation in HCMC's Flood Risk Management completed
- HCMC FRM Phase 1 Program (2016-2021)
- Unified entity for flood risk management established
- Core capacity for integrated planning for flood risk management developed, including consideration of "green" and nonstructural measures

Phase 2 program (2021-2027)

- Professional organization with Flood Risk Management capabilities established
- Well-functioning information systems established
- Operation and Maintenance Systems established
- Policy mechanisms HCMC to influence for river basin scale planning established

Infrastructure Capacity

Year (2016)

- Close to 60% of Plan 752 completed
- Investments in four sub catchments of the inner core area completed
- TLBC canal dredging completed
- No system of tidal flood prevention for inner core of HCMC

HCMC FRM Phase 1 Program (2016-2021)

- Completion of 752 plan improvements to the TLBC sub-catchment through dredging, canal bank protections, storm water and sewage development and improvement of secondary canals
- Four well-functioning critical tidal sluice gates under MARD 1547 plan.

Phase 2 program (2021-2027)

- Completion of interventions in all 5 sub catchments
- Entire HCMC's flood control and drainage systems well-functioning
- Waste Water Treatment system established and well-functioning
- Completion of 1547 Plan, including tidal sluices gates system, ship locks and dykes on left bank of Saigon river and Thu Duc Districts

21. As part of the first phase, the focus of the proposed HCMC FRM project would be to develop the institutions and tools needed to enhance the institutional capacity of SCFC and other relevant departments and authorities for integrated flood risk management while immediately improving the conditions of TLBC with "no/low regrets" structural investments.

22. Specifically, the objective of the first phase will be along dual tracks:

- **Institutional strengthening:** International experience (8) suggests that it is important to have a unified, professional entity at the city level that fulfills the following responsibilities and mandates: (a) coordinate effectively across various agencies at city and central levels; (b) be responsible for development of a flood risk management plan, and operation and maintenance of the city flood risk management systems (including flood protection, drainage systems, local canals, flood/tidal gates and valves) as a whole; and (c) develop and carry out emergency responses plan, including implementation of last-mile early warning system (9), public relations, and citizen participation. In Vietnam, it is essential that such an entity has direct reporting arrangements with the People's Committee. Capacity strengthening will also need to be provided to other relevant institutions in the City to ensure harmony and coordination with the abovementioned entity, especially with regards to environmental monitoring and protection.
- **Structural no-regret interventions:** To minimize flooding to the inner core area of the city by putting in place no-regret structural investments in flood management and sewage developments combined with storm water drainage in the Tham Luong – Ben Cat – Rach Nuoc Len sub-catchment, which are complemented by an initial set of institutional strengthening measures. In addition, the project will finance preparation studies for strategic tidal sluice gates that would alleviate tidal water intrusion into the city's canal network. The investments would be derived from the set structural interventions that have been proposed in Plan 752 and Plan 1547.

23. The proposed Project will include three components:

Component 1 – Capacity Building for Integrated Urban Flood Risk Management (Estimated Cost: US\$ 17 million)

24. This component will strengthen the capacity of SCFC and other public institutions to better plan and implement flood risk management measures (including disaster preparedness through early warning and flood emergency response, and risk reduction through risk sensitive spatial and sector planning), as well as to safeguard the river water quality and the health of the people living along the proposed canals. It would likely include:

- **Modernization of the Hydromet Observation Networks and Forecasting:** Three main investments are needed to improve local level forecasts in HCMC: (1) expanded observational network and ICT systems, (2) detailed hydromet modeling tools, (3) technical capacity at the city level to oversee these tasks and issue user-tailored warnings to the relevant stakeholders (e.g. in DRM, Transportation, Health, Energy, Water Resources). To avoid fragmentation and non-compatibility of different sub-systems in Vietnam, the investments will follow the national hydromet system architecture specifications developed under the Vietnam Managing Natural Hazards Project.
- **Flood Risk Information Management System:** A city-level information system would need to be established in SCFC to support key flood risk management decisions for enhanced preparedness and response actions, and risk reduction investments. It would be designed to take the hydromet modeling output and automatic data observation network for better flood monitoring as dynamic data streams. The system would be established in a flood operation/command room with equipment, flood modelling and a pool of trained experts. In addition, SCFC will receive support to

build capacity to analyze the collected data, such as detailed flood hazards, exposures and risk mapping to developed tailored outputs for key stakeholders. The processed information would be accessible by relevant agencies and public to help better plan and make risk sensitive investment decisions, improve operation of the drainage and flood control systems, and provide support to emergency and public early warning operations.

- **Enhanced Early Warning and Flood Emergency Response:** This activity focuses on the institutional and regulatory actions required to strengthen early warning and flood emergency response capacity. It is dependent on improvements to hydromet and information management systems described above. It will help the city develop (i) improved Standard Operating Procedures and regulatory frameworks for early warning issuance and flood response mechanisms including greater involvement of community and local stakeholders particularly to improve “last mile” early warning efficacy; (ii) protocols for operating the city's flood control and drainage systems including clarification of responsibilities of the three key agencies in managing and operating the systems during emergencies (high tide, excessive precipitation, upstream river discharge, etc.); (iii) an Operations & Maintenance (O&M) funding framework for the systems; and (iv) a protocol between the city and upstream dam operators to share information and enhance downstream flood prediction for early warning.
- **Capacity for risk sensitive spatial and sector planning:** This activity would strengthen the capacity of city agencies for integrated river basin management with a focus on non-structural and “green” investment measures. Based on the specific needs identified during preparation, standardized planning tools (both policy and technical) would be developed including the possibility of participatory watershed management. This will likely require additional monitoring data, such as scaled-up land subsidence monitoring system related to ground water management, which can be linked and synchronized with the information system established within the SCFC for flood risk analysis and mapping.
- **Canal water quality management program:** This program will build and strengthen the capacity of main stakeholders (DONRE and SCFC) to investigate (e.g., inspect) and supervise (e.g. monitor) the water pollution risks generated by various sources such as untreated industrial zones actions, domestic activities and overall sewage discharges in the project area. It will finance (1) support with the broader monitoring network required for HCMC surface water, groundwater and air quality including automatic monitoring stations strategically selected along the targeted canal systems; (2) preparation of a detailed sediment management study and plan addressing sludge and sediment pollution management that builds on existing relevant flood risk management studies and solid waste master plan developed for the basin; (3) strengthening of the water quality monitoring program management – this will consist of resources to revise the existing water quality indicators, sampling and analysis procedures and protocols to enhance the management of surface water quality in HCMC, as well as to increase the local capacity (including laboratories) to improve water resources risk management and train field staff and those responsible to sample, analyze, report and coordinate on water quality on a regular basis; and (4) local capacity improvement for solid waste management in the project area: this activity will finance public awareness program consisting of educational campaigns related to environmental and public health concerns associated with waste management

Component 2 – Priority Flood Risk Reduction Interventions (Estimated Cost: US\$ 406 million)

25. Priority Flood Risk Reduction Investments in Tham Luong – Ben Cat – Rach Nuoc Len sub-catchment. This component would support the City in implementing significant structural measures proposed in the JICA Plan (Plan 752). The scope of this work including:

- 2.1. Construction of 2 tidal sluice gates at the end Vam Thuat and Rach Nuoc Len canal to control tidal inflows.
- 2.2. Improvements to the Tham Luong – Ben Cat – Rach Nuoc Len Canal through dredging and constructing embankments to improve its ability to discharge flood waters at the safety level of 100-year return period. At the sub-catchment level, the proposed project will examine options for storm water retention, infiltration, green areas, and pervious concrete.
- 2.3. Construction of a primary and secondary combined storm water drainage and waste water sewage system in Go Vap District at the safety levels of 20-year and 10-year return period, respectively.
- 2.4. Improvement of secondary canals that are connected with primary Tham Luong – Ben Cat – Rach Nuoc Len Canal at the safety level of 10-year return period to improve the urban flood management and to reduce the pollution of the Canal and Sai Gon River with sewage water.
- 2.5. Provision of consultant services, as well as project monitoring and evaluation (M&E) functions including independent monitoring of RAP and EMP implementation, also to help the City to prepare and carry out the implementation of land acquisition and environmental impact mitigation plan.

Component 3 – Implementation Support (Estimated Cost: US\$ 44 million)

26. This component would provide support to the following activities: preparation of feasibility studies; detailed design and bidding documents; construction supervision; and implementation and monitoring of social and environmental safeguards policies. The primary activities proposed under this component will include:

- Preparation studies of Two Priority Tidal Flood Control Sluice Gates of Cay Kho and Phu Dinh under MARD 1547 Plan. Two gates would reduce the impact of tidal flows to the inner core area, particularly in the high tide season;
- Provision of equipment; and
- Provision of technical assistance, composed of national and international specialists for management support, including advisory and training support.

IV. Safeguard Policies that might apply

Safeguard Policies Triggered by the Project	Yes	No	TBD
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	

V. Financing (in USD Million)

Total Project Cost:	467.00	Total Bank Financing:	422.00
Financing Gap:	0.00		
Financing Source			Amount
BORROWER/RECIPIENT			45.00
International Bank for Reconstruction and Development			422.00
International Development Association (IDA)			0.00
Total			467.00

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