Project Information Document (PID)

Concept Stage | Date Prepared/Updated: 17-Oct-2019 | Report No: PIDC27752

BASIC INFORMATION

A. Basic Project Data

Country	Project ID	Parent Project ID (if any)	Project Name
Vietnam	P171700		Vinh Long Urban Development and Climate Resilience Project (P171700)
Region	**Estimated Appraisal Date**	**Estimated Board Date**	**Practice Area (Lead)**
EAST ASIA AND PACIFIC	Mar 30, 2020	Jun 15, 2020	Urban, Resilience and Land
Financing Instrument	**Borrower(s)**	**Implementing Agency**	
Investment Project Financing	Socialist Republic of Vietnam	ODA PMU of Vinh Long Province	

Proposed Development Objective(s)

To improve access to infrastructure and connectivity and to reduce flood risk in the urban core area of Vinh Long city.

PROJECT FINANCING DATA (US$, Millions)

SUMMARY

Total Project Cost	219.40
Total Financing	219.40
of which IBRD/IDA	163.40
Financing Gap	0.00

DETAILS

World Bank Group Financing

International Development Association (IDA)	163.40
IDA Credit	163.40

Non-World Bank Group Financing

Counterpart Funding	56.00
Borrower/Recipient	56.00

Environmental and Social Risk Classification	Concept Review Decision
Substantial	Track II-The review did authorize the preparation to continue

Other Decision (as needed)

B. Introduction and Context

Country Context

1. **Since the introduction of the comprehensive reforms in 1986, known as 'Đổi Mới', Vietnam has experienced impressive economic growth** that has also been equitable and stable, allowing the country to transform from a low-income economy to a middle-income economy in one generation. Vietnam has had one of the fastest GDP per capita growth rates (averaging 5.5 percent a year) since the early 1990s, yielding a three-and-a-half-fold increase in average income. External trade has been a major driver, much of it powered by strong foreign direct investment. Economic growth has brought dramatic structural transformations, with the agricultural sector's share in GDP falling from more than 40 percent in the late 1980s to less than 20 percent in recent years. That decline has been mirrored by a rise in services and industry shares. These sectoral GDP trends have been broadly matched by sectoral trends in employment.

2. **Economic growth, coupled with the government's strong focus on inclusive development, has yielded shared prosperity and strong gains in poverty reduction**. The $1.90-a-day poverty rate fell from 50 percent in the early 1990s to 3 percent today. Using the General Statistics Office (GSO)–World Bank standard, poverty incidence fell from about 58 percent to 13.5 percent over the same period. Access to basic infrastructure has also improved substantially. Electricity is now available to almost all households, up from less than half in 1993. Access to clean drinking water and modern sanitation in urban areas has risen from less than 20 percent of all households in 1999 to more than 90 percent and 78 percent respectively in 2015[1]. By the World Bank's measure of shared prosperity (i.e., the income growth of the bottom 40% of the population), Vietnam is one of the most noteworthy cases of long-term shared prosperity globally.

3. **Although Vietnam has avoided the large increases in inequality observed in other fast-growing countries, the differences between rich and poor are still significant**. In urban areas, the poverty rates in smaller cities are relatively high as compared to large cities. According to the GSO/WB poverty line, only 1.9% of the urban populations in Hanoi and Ho Chi Minh City (HCMC) are poor, while 11.2% of the populations of small cities[2] are poor. Vietnam's small and medium-size cities[3] represent only 43% of the nation's urban population, however they contain 70% of the total urban poor.[4] In particular, ethnic minorities (15 percent of the population), face a growing gap relative to the majority population and now represent half of the poor.[5]

4. **Despite large investments in risk management, cities in Vietnam remain highly vulnerable to weather related**

[1] Joint Monitoring Program Report (WHO/UNICEF, 2015).
[2] Class 4 and 5 in Vietnam's city classification.
[3] Class 3, 4 and 5 in Vietnam's city classification.
[4] Vietnam Poverty Assessment (World Bank, 2012)
[5] Vietnam 2035 Report (World Bank 2016)

hazards such as typhoons, floods and drought, which are expected to become more frequent and intense with climate change. Vietnam has been ranked among the five countries likely to be most affected by climate change[6], due to the concentration of a high proportion of its population and economic assets in vulnerable coastal lowlands and deltas. It is estimated that Vietnam's average annual disaster related losses are approximately US$2.4 billion, or almost 1.5% of GDP.[7] Sea level rise of 0.22m and an increase in rainfall of between 12.4% and 33.3% are expected by 2030, based on scenario RPC4.5[8] and will further increase flood levels. The Mekong Delta is particularly vulnerable to climate change and hydro-metrological disasters such as flooding, which have significantly impacted the socioeconomic development of the region. Approximately half of the Delta is flooded to a depth 1 to 3 m annually, and the situation is being further exacerbated by sea-level rise and land subsidence. Coastal erosion and saline intrusion leading to the contamination of drinking water, are other issues that are likely to increasingly impact the Mekong Delta in the future. The growth of greenhouse gas emissions in Vietnam is the fastest in the region, while the environmental quality of its air, land, and water has deteriorated considerably. The impacts of climate change are exacerbated by inappropriate land use planning and ecosystem degradation and are typically linked to adverse health consequences, including water related and vector- borne diseases. In addition, the poor, the elderly and people with disabilities are especially vulnerable to climate change and hydro-metrological disasters, given the rapid increase in the elderly population[9] and the relatively high proportion of people living with disabilities in Vietnam.[10]

Sectoral and Institutional Context

5. **Vietnam's rapid economic development and structural transformation over the past three decades has led to extensive urban transformation, with urban areas now contributing more than half of the country's GDP.** Vietnam has a low level of urbanization (37.5% of the population in 2017) compared to most countries in the East Asia region, but its urban population has grown steadily at 3.4 percent a year since the late 1980s, from fewer than 13 million urban residents to more than 30 million today. The urbanization process has accelerated in recent years, with half the country's population expected to live in urban areas by 2035.[11]

6. **Notwithstanding the impressive social and economic outcomes brought about by urbanization, there are signs that Vietnam's current urbanization model is losing momentum**. A notable characteristic of urban development in Vietnam has been the low and stagnant levels of urban density, with industrial zones developed ahead of demand and a proliferation of small, fragmented and poorly connected urban centers. Between 2000 and 2015, urban density remained at 18.9 residents per hectare, while urban land expanded by over 650,000 hectares.[12] This development pattern is largely driven by cities' desire to generate more land related revenues and move up the government's urban hierarchy[13], but also reflects the relatively weak institutions responsible for urban development and planning. There are no clear frameworks or effective mechanisms for spatial regulation in the plans, resulting in weak protection of open spaces, agricultural land, and other natural resources and a lack of consideration of the impact of climate change and disaster risks. The World Bank's flagship Vietnam 2035: Towards Prosperity, Creativity, Equity and Democracy report emphasized the need to strengthen institutions for integrated urban planning, both functionally and spatially, to further enable agglomeration economies.

[6] Vietnam: Climate Risk Country Profile (World Bank and Asian Development Bank, 2018).
[7] UNISDR (2014) PreventionWeb. https://www.preventionweb.net/countries.
[8] Hydraulic modeling report for World Bank Scaling up Urban Upgrading Project (SIWRR, 2017)
[9] Vietnam is one of the most rapidly aging countries in the world. Around 2035, the old age dependency ratio — the number of people 65 years of age or older for every 100 people aged 15–64 — will have risen to almost 22 (from under 10 today), while the working-age population will begin to decline in absolute terms. Vietnam 2035 Report (World Bank 2016)
[10] Statistics show between 7.5 to 15 per cent of Vietnamese people are living with disabilities. Palmer M, Groce N, Mont D, Nguyen OH, Mitra S (2015) The Economic Lives of People with Disabilities in Vietnam. PLoS ONE 10(7): e0133623.
[11] Vietnam 2035 Report (World Bank 2016)
[12] Vietnam 2035 Report (World Bank 2016).
[13] The urban classification system consists of six classes of urban areas that are defined by different levels of economic activities, physical development, population, population density, and infrastructure provision. It serves as a basis for the central government to determine budget transfer allocations to urban areas, thus providing strong incentives for cities and towns to move up the urban class ladder.

7. **The Mekong Delta Region (MDR), being the agricultural base of Vietnam, is one of the most densely populated regions outside the metropolitan regions of Hanoi and HCMC**. The MDR covers an area of 40,604.7 km^2, with a population of 17,590,400 (2015), accounting for 13 % and 19% of the country respectively. Cities in the MDR had average annual economic growth rates of between 13 % and 20 % from 2006 to 2010. Despite these impressive economic growth rates, the MDR cities are typically small or medium in size with limited fiscal resources and relatively high poverty rates. MDR cities have struggled to keep up with the demographic and socioeconomic demands brought about by urbanization. Access to basic services, such as sanitation, drainage and quality water supply, remains as low as 15% in MDR cities, as compared to 80% in large cities such as HCMC and Hanoi. Only 7.6% of cities have appropriate wastewater collection and treatment systems, with the majority lacking any systems.[14] In 2016, between 14 % and 30 % of the population in the MDR cities consisted of low-income households, including a large proportion of ethnic groups and people with disabilities[15]. Most MDR cities frequently suffer from flooding and other negative climate change impacts because of their low elevation and infrastructure deficits.

8. **One of the 13 provinces in MDR, Vinh Long is strategically located along the economic corridor that connects HCMC to the Mekong Delta Region**. The approved 2018 Adjusted Regional Plan for Infrastructure Development of the Mekong Delta, defined Vinh Long province's role in the Region as a center for: agricultural technology; agri-processing; commercial activities; training; research and technology transfer services; and eco-tourism. The HCMC-Can Tho highway currently under construction and the planned HCMC-Can Tho railway are expected to further unlock Vinh Long's economic development potential. Vinh Long city, the capital of Vinh Long Province, has a population of around 150,000 (about 80% are urban) and an annual GDP growth rate of about 10%.

9. **Flooding has been identified as a major impediment to Vinh Long's long-term development.** Located on the Tien river plain, the city has an elevation of 1.6-2.5m above mean sea level and about 60% of the city is susceptible to flooding due to extreme rainfall and high water levels in the Mekong. Its network of canals suffers from issues of sedimentation, water surface encroachment and pollution due to untreated domestic wastewater and solid waste. Vinh Long DONRE reported wastewater quality exceeding the national standard by 1.3-11 times[16]. Urban drainage system upgrades, flood mitigation infrastructures and nature-based solutions to increase water retention, are city priorities.

10. **Flooding in the MDR is complex. Effective management of flood risk requires an integrated and cross-sectoral approach, in particular close coordination among several government agencies that have overlapping mandates and authorities in flood risk management**. In Vinh Long province, the Department of Agriculture and Rural Development (DARD) is responsible for irrigation and flood management; the Department of Construction (DOC) is responsible for urban planning and construction management, while maintenance may be outsourced to private companies; the Department of Transport (DOT) is responsible for the planning, design and maintenance of the transport system, which requires close coordination with DOC for the drainage and wastewater system and with the Urban Public Works Company for urban landscaping and street lighting; and the DONRE is responsible for water resource and environmental management. In addition, the Provincial Steering Committee of Disaster Prevention, Search and Rescue, coordinates flood management and emergency response. There is a need to strengthen coordination of these fragmented institutional structures and consolidate the operations and maintenance strategy as part of an integrated flood management system.

11. **Integrated flood management also entails deploying a mix of structural and non-structural measures, including flood mitigation infrastructure, nature-based solutions, flood awareness and information, flood emergency management, land use planning and development control**. The current grey infrastructure solutions in Vietnam's cities

[14] Vietnam Urbanization Review (World Bank 2011)
[15] More than 20% of Vietnamese households with people with disabilities are concentrated in Mekong Delta Region, where the proportion of households with people with disabilities is as high as 20%, one of the highest ratios among the six regions (only second to the North and Central Coast. Vietnam National Survey on People with Disabilities, 2016
[16] Environmental Monitoring Report by the Vinh Long Department of Natural Resources and Environment, 2015.

result in increased stormwater runoff, fast discharge of flood water, and a lack of infiltration, exacerbating localized flooding. The extensive use of concrete, the felling of trees, and the extension and widening of the roads, increases both the urban heat island and greenhouse gas emissions (GHGs)[17]. Various green, environmentally friendly nature-based solutions, such as retention and detention ponds, water absorbing landscapes, bio-engineering methods to create more natural green canal embankments etc., can complement these engineering measures. Together with sewer separation and wastewater treatment to improve water quality, these measures will reduce the rate and volume of stormwater runoff, flooding, heat and GHGs emissions; and increase urban livability, resilience and attractiveness of the city.

12. **The Government of Vietnam (GoV) adopted Resolution No. 120[18] in 2017 on Sustainable and Climate-Resilient Development of the Mekong Delta, which set out the guidance for the future development of the Mekong Delta**. It highlighted the importance of "nature-based adaptation, environmentally sound and sustainable development, on the basis of actively living with flooding". It also proposed to "develop an Integrated Master Plan for sustainable and climate resilient development of the Mekong Delta." This is in line with the new Planning Law, approved in 2017, which requires a multi-sectoral integrated planning approach at the national, regional and provincial levels. Linked to this, the Ministry of Planning and Investment (MPI) is preparing a Mekong Delta comprehensive development plan for climate change adaptation and socio-economic development. This plan will guide development planning for the 13 MDR provinces, including Vinh Long.

13. **Due to the exponential growth of technology advances and their increasing accessibility and affordability**, **cities globally are increasingly tapping into information and communication technologies (ICT) to improve the efficiency, effectiveness, and adaptability of their physical, social, institutional and economic infrastructure.** There are many smart city solutions globally that Vietnamese cities can learn from in order to improve their sustainability and resilience, including those aimed at increasing citizen participation. In 2018, the Prime Minister issued a decision to approve the scheme for *"Development of sustainable smart cities in Vietnam in the period of 2018-2025, vision to 2030",* which identifies Mekong Delta as one of the focus areas. The MOC is responsible for developing a smart city plan and the Ministry of Information and Communication (MOIC) released a decision on smart city ICT framework in May 2019. In Vinh Long, DOIC plans to develop their provincial ICT smart city framework by 2022; DoNRE has created a geodatabase for land management, and is developing a smart phone application to allow public access to spatial information. Increasing the transparency of planning, coupled with disseminating other information on natural hazards and socio-economic profiles of the residents, will help increase the awareness of hazard risks to the populations.

14. **The World Bank has supported several GoV projects in MDR and the relevant lessons and experiences will be reflected in the proposed project**. The Bank concluded the Mekong Delta Region Urban Upgrading Project in 2018, which financed infrastructure improvements in six cities in the MDR and is currently financing the Scaling Up Urban Upgrading Project (SUUP) in the remaining seven cities in the MDR, which aims to improve infrastructure and strengthen urban planning capacity, with a focus on Low Income Areas (LIAs). The Bank is also financing the Can Tho Urban Development and Resilience Project, focusing on the mitigation of flood risks and adaptation to climate change. The Mekong Delta Integrated Climate Resilience and Sustainable Livelihood Project has also been implemented since 2016 covering nine provinces in the MDR including two rural districts in Vinh Long. Vinh Long Province is participating in the World Bank financed Vietnam Improved Land Governance and Database Project to set up a Multipurpose Land Information System. In addition, the World Bank has worked with GoV on several studies related to climate resilience in the MDR including for the MDR comprehensive development plan.

[17] There are greenhouse gas emissions associated with the manufacturing processes of both concrete and asphalt. Emissions will vary by manufacturing method, energy mix, feedstock, and other factors.
[18] Resolution No.120/NQ-CP issued by the Government on November 17, 2017, following the Regional Sustainable Development Conference held in late September 2017 - hereinafter referred to as Resolution No.120.

Relationship to CPF

15. **This operation is consistent with the World Bank Country Partnership Framework (CPF) for Vietnam 2018-2022[19], including support for two important higher-level objectives.** Firstly, the project will contribute to improved infrastructure conditions in the urban core area of Vinh Long and enhanced urban planning and management. This will directly contribute to the achievement of Objective 5 of the CPF to "improve planning, management, and delivery of infrastructure and land in cities" under the first focus area to "enable inclusive growth and private sector participation." Secondly, the project will support the achievement of Objective 10 of the CPF to "increase climate resilience and strengthen disaster risk management" under the third focus area to "enhance environmental sustainability and resilience". The proposed project will support resilient urban infrastructure investments and provide technical assistance to improve the disaster risk management of Vinh Long city, including planning, operation of flood mitigation infrastructure, communication and raising community awareness, and improving the efficiency of infrastructure services through leveraging smart city solutions. The proposed project is fully aligned with the Bank's Twin Goals of eliminating extreme poverty and boosting shared prosperity by supporting Vinh Long city in increasing access to improved basic services for the bottom 40% of the population, removing infrastructure constraints, improving connectivity and access to jobs for both male and female members of local communities.

16. **The Vinh Long Urban Development and Climate Resilience Project is in line with the World Bank's new generation of urban interventions in Vietnam centered around a multi-sectoral approach to improve access to urban services and resilience**. The project will build on the lessons and experiences of the Bank's previous and ongoing interventions in the MDR and other countries, and will be guided by the following principles: a) leveraging accessible and affordable new technologies for better managing risk, with a focus on incorporating flood risk assessment in planning, strengthening operation and maintenance, sharing of information across administrative units, and community participation; b) integrating remedial and preventive measures to increase connectivity and guide future urban development in low risk areas, while improving the living conditions of the urban core; c) harmonizing nature-based solutions with gray infrastructure design to increase adaptability and reduce the life cycle costs of operation and maintenance; and d) enhancing the quality of infrastructure with consideration of climate change and the needs of diverse populations including women, ethnic groups, elderly and the disabled.

C. Proposed Development Objective(s)

17. To improve access to infrastructure and connectivity, and to reduce flood risk in the urban core area of Vinh Long city.

Key Results (From PCN)

18. The PDO outcome indicators are:

Table 1. PDO Outcome Indicators

PDO Outcome	Outcome indicator
Improved access to infrastructure	• Number of people with access to new or improved basic urban infrastructure facilities and services (number, percentage of which female). • Users satisfied with the new or improved drainage and sanitation services (percentage, percentage of which female)

[19] Country Partnership Framework for the Socialist Republic of Vietnam for the Period FY18-FY22 (World Bank 2017, Report No. 111771-VN).

Improved connectivity	• People with access to new or improved roads (number, percentage of which female) • Reduction in travel time between: i) Ward 8 and Ward 9; ii) residential areas along National Road 53 and National Road 1A; iii) areas along national roads 53, 57 and 1A; and iv) central area and the planned industrial zone along the future HCMC-Can Tho highway.
Reduced flooding risk	• People living in the urban core protected against a combination of 10-year return period local rainfall flood and 100-year return period riverine flood (number, percentage of which female)
Improved urban management	• Integrated flood risk management system developed

D. Concept Description

19. **Proposed project focuses on investments unlock development potential of urban core**. Vinh Long is one of seven cities in the Mekong Delta Region currently implementing the World Bank financed SUUP Project, which invests $35mln for improving basic infrastructure in low income areas in Vinh Long. However, without a comprehensive approach to manage flood risks, Vinh Long city's core urban area remains most exposed to flood risk due to the high concentration of poor population living in LIAs, the low elevation, and a lack of investments in drainage, wastewater collection and treatment and flood protection infrastructure that exacerbates the impacts of flood events. The severe flood risk in the core urban area, together with the lack of integrated planning, has led the city to sprawl outwards along national roads and main waterways in different directions, while large pockets of land in the core urban area remain undeveloped. This fragmented development pattern results in high costs for land acquisition and infrastructure provision, the loss of productive, water-retaining agricultural land and increased greenhouse gas emissions, as well as high transport costs that impede the realization of an agglomeration economy. The proposed project will therefore focus on priority investments and technical assistance that aim to unlock the development of core urban areas and promote a more compact and sustainable development pattern.

20. **The proposed project will include a combination of structural and non-structural interventions to improve access to infrastructure and to reduce flood risk in the urban core area of Vinh Long city**. The urban core will be protected through a comprehensive set of flood mitigation measures, including flood control systems, wastewater collection and treatment and nature-based solutions to reduce flood risk and improve environmental and sanitation conditions. Connectivity within the urban core and with key economic centers will also be improved. These measures will eliminate the physical constraints to development in the urban core, increase land values and stimulate private capital investments, enabling the redevelopment of the urban core and reducing the pressure for urban sprawl. By providing comprehensive improvement to infrastructures in the low-income areas in the urban center and increasing the connectivity of these areas to other parts of the city, especially centers of employment, the project is expected to improve the living conditions of the poor and vulnerable populations and increase their accessibility to jobs and public services. Citizens and community organizations will be engaged throughout the project preparation and implementation process in order to raise their awareness about flood risks and enhance their ownership of the project. Providing technical assistance to improve urban planning, transport management and the operation and maintenance of infrastructure in the urban core, will enable the city to become more interconnected, livable and resilient to disasters.

21. **In the interest of maximizing the available finance for development,** opportunities will be identified for increased private sector participation in the proposed environmental sanitation and urban transport investments. The project will explore options for private sector participation through partial financing of infrastructure, utility reform, and network operations by private operators. Furthermore, through investments in critical infrastructure such as urban drainage and flood protection, there are expected to be spillover benefits into investments in industrial zones and tourist attractions, that will

lead to further private investment in the city.

22. **The project will also adopt a gender sensitive approach to ensure equal rights for both men and women to participate in the project, and equal opportunities to access and benefit from services supported by the project**. Studies show that women in general tend to be disproportionately impacted by floods, especially given their roles as primary caregivers and providers of food and fuel. Improvement of the road network, environmental sanitation, and flood mitigation through the project is expected to increase women's convenience in accessing markets and jobs and sending children to school, while reducing their housework related to cleaning up during/after floods and enabling some of them to start home-based businesses while attending to their families. During project preparation and implementation, gender-segregated consultations will be conducted and technical designs of investments will consider the different needs for women and men (e.g., differentiated travel patterns, perception of safety, and universal access design principles). The Women's Union[20] at the ward/community level will be actively engaged in disseminating project information, providing feedback, organizing consultations and training, and serving as liaisons between the community and PMU. During project evaluation, the project will monitor indicators disaggregated by gender.

Project Components

23. The project is organized around four components:

Component 1: Flood risk management and environmental sanitation (WB Loan/Credit: US$ 93.3 million)

24. The objective of this component is to reduce flood related risks and improve environmental sanitation in the urban core of Vinh Long city through investments in drainage and sewage networks, wastewater treatment and flood protection measures. Design of this component will be based on assessment of the flood risks, including flood hazard and the vulnerability of the affected community, and consists of a balance between gray and green infrastructure (or nature-based solutions). The structural measures include improving the *pathways*[21] of floods, by rehabilitating and upgrading the canals and drainage and improving sewage system to reduce pollution during flooding, protecting the *receptors* by expanding and upgrading roads and building embankments, as well as ways to control the *sources* of flooding including Sustainable Urban Drainage Systems (SUDS), flood retention and detention through rainfall capture and runoff control using nature-based solutions. Nature-based solutions are proposed to reduce runoff and minimize flooding, such as water absorbent landscape, pervious pavement, detention and retention ponds; while bio-engineering methods are proposed as more natural ways to stabilize canal embankments using soil bags, gabions, erosion control blankets, geogrids etc. These solutions will be incorporated to reduce the burden and associated cost of the gray infrastructure. Non-structural measures will focus on putting in place effective mechanisms for institutional coordination, integrating flood risk analysis in urban planning and management, and improving operation and management (O&M). In addition, the design of infrastructure will factor in access to services for women and men and universal design (i.e., ensuring accessibility for older people and people with disabilities) considerations.

25. *Sub-component 1.1: Urban drainage system.* This component will finance the rehabilitation and improvement of the canal and drainage system in the core areas, including construction of new drains, dredging of canal systems, creation of rainwater retention areas, etc. This is critical for enhancing the capacity of rainfall capture, runoff control and conveyance to reduce flood risks and sustaining the significant private and public investments in the inner parts of the city. The designs of drainage infrastructure will take into account climate change scenarios produced by MONRE and reflect them through

[20] The Women's Union is a sociopolitical organization that represents and defends the legal and legitimate rights and interests of women in Vietnam and has representatives at the grassroots level of wards or communes.
[21] The 'source-pathway-receptor' model is a useful tool to help understand flooding risk and flood mechanisms. The flood sources include water from rivers and the sea, as well as groundwater and direct rainfall. The pathways consist of overtopping of flood defences, seepage through dikes, rising groundwater. While receptors are the people, property, infrastructure and urban developments in the flood plains. Fluvial Design Guide, Environment Agency, UK, FO Ogunyoye, J JH Flikweert, no date) http://evidence.environment-agency.gov.uk/FCERM/en/FluvialDesignGuide.aspx

improved hydraulic modeling works and flexible use of structural and non-structural approaches. Secondary flow paths for conveyance of flood water in excess of the drainage system capacity should be considered. In terms of geographical coverage, this sub-component will prioritize the improvement of basic infrastructures in six low-lying residential areas in the urban center covering about 121 ha and benefiting 12,000 inhabitants, most of whom have relatively low incomes. The scope and design of investments in these areas will be developed through a participatory process similar to that used under the SUUP.

26. *Sub-component 1.2: Wastewater collection and treatment system.* This includes the construction of a wastewater treatment plant and rehabilitation and construction of sewer collection networks to collect and treat domestic wastewater before it's discharged into water bodies. Based on the findings of an Asian Development Bank (ADB) report[22], the wastewater collection and treatment will be prioritized for urban inner areas with an estimated service population of about 119,000 people (about 80% of city's total population) and a land area of about 2,060 ha. A separate system for wastewater collection has been proposed. The treatment capacity of the WWTP in 2023 is estimated to be up to 15,000 m3/day-night, but the underlying calculations are still being reviewed. In addition to improving the environmental sanitation conditions, the wastewater collection and treatment will also contribute to improving surface water quality. Technical designs for this sub-component will also explore incorporation of nature-based solutions such as constructed wetlands and treatment ponds. Operators will be equipped with appropriate O&M equipment including vehicles such as suction trucks and combined high-pressure cleaning trucks. The use of renewable energy sources such as solar energy for covering part of the treatment plant's energy demand will be explored. Wastewater collection and treatment will require comprehensive capacity building and training of all involved stakeholders, as well as institutional development and strengthening. The project will also consider mechanisms to support household connections and cost recovery of WWTP operation.

27. *Sub-component 1.3: Flooding mitigation in the urban core area.* A polder approach was proposed for flood mitigation, which can be expressed as a structural system consisting of: i) a closed "ring embankment with tidal sluicegates/valves" to protect areas from high water on the edge of rivers (river and tide floods); and, ii) a drainage system including open canals, sewers, storm rainwater retention, and pumps (if needed). According to the Flood Control Plan for Vinh Long city approved in 2013 by Ministry of Agriculture and Rural Development (MARD) and the Adjusted Construction Master Plan for Vinh Long city currently being prepared, three small polders are proposed in the inner city of Vinh Long to protect the core urban area (2,059 ha) from river and tidal flooding. It is proposed that the polder dikes to the south will serve the dual purpose of flood control and road connectivity, through aligning the raised urban main road No.2 along the southern polder dike. This polder approach with a dual-purpose road is considered more flexible and cost-effective compared to the conventional ring embankment approach. A flood risk assessment based on updated hydraulic modeling of the core urban area of Vinh Long city is being carried out to validate the polder approach and optimize options for nature-based solutions. The stabilization of the embankment will consider green bio-engineering methods. Where possible, the creation of amenities comprising green spaces with native and shade providing tree species and promenades with tracks and boardwalks along the embankment will be provided for both cyclists and pedestrians in order to turn the waterfront into an attractive recreational area.

28. *Sub-component 1.4: Development and operation of an integrated flood risk management system in the city.* Currently, there is considerable fragmentation and overlap in flood risk management responsibilities among key agencies. This lack of clarity reduces effectiveness in planning, implementation and operation of the flood related infrastructure in Vinh Long. Improvement to the flood risk management system will enable the city to: i) define clear roles and responsibilities of key agencies, including DARD, DoC and Water Supply and Drainage Companies, in the operation and management of the city flood control and drainage system; ii) improve protocols in operation of the city flood control and drainage system in the case of emergency (high tides, river flood discharge, etc.); iii) develop an operation & maintenance (O&M) framework for the systems; iv) develop an improved early warning information system, as well as conduct public awareness raising through existing mass media and organizations and coordinate with other Mekong provinces on

[22] TA 7885 VIE: Support to Central and Local Governments to Implement Urban Environmental Improvement Programs, Asia Development Bank, 2015

information sharing; and v) if the polder approach is adopted, install a SCADA system in the flood mitigation structures including devices such as remote water level sensors, rain fall recording stations, hardware and software for internal and external data processing and operation of sluice gates.

Component 2: Strategic corridors development (WB Loan/Credit: US$ 41.5 million)

29. This component will finance the prioritized investments in roads as identified in the draft Adjusted Construction Master Plan of Vinh Long City to increase regional and intra-city connectivity. Development of the core urban area is currently segmented by several national roads with the inter-city traffic flow going through the city, causing safety concerns and constraints to compact urban development. The proposed roads will improve traffic safety by providing alternative routes for the inter-city traffic to bypass the city center, provide better accessibility for residents to jobs, education, and other services, and allow for mixed land uses and densification in less flood prone areas. The "green roads" will be proposed which will be tree lined, act as green shade providing corridors and include nature-based solutions to deal with rainwater runoff. 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 and densify the urban core area, which will be protected by the flood protection scheme.

30. The project will also promote non-motorized transport options as well as consider the future creation of urban public transport networks in the design of main roads. The road width will be based on sound analyses of travel and traffic demand. Traffic safety issues will be thoroughly reviewed and addressed, especially at intersections with major roads and transit roads of national highways/bypasses, as well as pedestrian crossings. To address the potential impacts of climate change, road drainage structures will be designed based on hydrologic analyses that adopt climate change scenarios while the elevation of roads will take into account projected increases in seawater levels. The design will also incorporate nature-based solutions such as "green roads" comprising pervious pavement and water absorbing tree pits and landscape, as well as universal access criteria such as providing a network of accessible pedestrian routes, appropriate tactile pavement, improved sidewalk space and pedestrian crossings, creation of appropriate parking spaces for motorcycles to reduce the obstruction to pedestrians, and prioritizing pedestrian connections to major destinations such as schools, employment centers, markets and shopping areas and public transportation stops.

31. Component 2 will finance the following investments:

- Vertical connection road between Ward 8 and Ward 9, which is currently a missing link in the urban road network.
- Urban main road No. 1. This road plays a role of a horizontal arterial in the urban road network to facilitate connectivity between residential areas along National Road 53 and National Road 1A.
- Urban main road No. 2. This will link national roads 53, 57, 1A and 1A bypass. This road will divert the inter-city traffic from going through the city center, and also provide flood control through tidal gates and pumping stations installed along the road.
- Extension to Vo Van Kiet Street. This enhances connectivity of the central area with the HCM-Can Tho expressway in the future, and with the planned industrial zone in this area.

32. The first two roads will run through the existing built-up area and serve to create the important vertical and horizontal links in the urban road network. The Urban main road No. 2 will serve multiple purposes, as a development boundary in the south, horizontally linking several national roads so as to prevent inter-city traffic from mixing with intra-city traffic, at the same time the elevated road embankment will serve as part of the flood control scheme. The extension to Vo Van Kiet Street is a major transport link to connect residents with jobs in the industrial areas. Special attention will be paid to the development control along urban main road No. 2 and the extension to Vo Van Kiet Street in order to avoid unintended urban sprawl.

Component 3: Resettlement Area Development (WB Loan/Credit: US$ 4.9 million)

33. The project will try to minimize resettlement impacts through adopting fit-for-purpose standards and appropriate design, however, significant resettlement impacts are expected due to the proposed investments, particularly under the embankments in Component 1 and the roads in Component 2. An estimated 445 households may have to be relocated under the project. This component will ensure improved living conditions and security of tenure for those target communities who are subject to relocation and resettlement under the project. An investment for technical and social infrastructure at the resettlement site in Ward 8 of Vinh Long City will be proposed with green and nature-based solutions incorporated, such as park connectors, water absorbing tree pits and landscapes, pervious pavements, stormwater detention ponds, raingardens, etc. This resettlement site covers an area of 12.5 hectares which is currently agricultural land and not occupied by any households, easing the compensation process. In addition, the resettlement site is assessed to be appropriate as it is just 5 km from the city center and close to National Road 53. Services (water, drainage, electricity, access roads) are already present along the proposed resettlement area, which will facilitate the development of the site.

Component 4: Enhancing Climate Resilience in Urban Management (WB Loan/Credit: US$ 2.4 million)

34. This component aims to improve urban management in a climate and risk informed manner and to set the stage for the development of Vinh Long as a smart city. The proposed project will support implementation of Vinh Long's smart city ICT framework currently being developed, through investments in data and ICT infrastructure including software, hardware and equipment, in conjunction with counterpart fund from the province. It will finance development of a geospatial data sharing platform to improve data sharing across different departments, and specific smart city applications including information management systems in flood risk management, transport management, and equipment for improving Operation and Maintenance (O&M) of the newly invested infrastructure.

- *Developing a geospatial data sharing platform and leveraging ICT for improving urban management.* A geospatial data infrastructure that integrates spatial and non-spatial data is important for multi-dimensional assessments on climate resilience and serves as a foundation for creating applications for monitoring, evaluation and enforcement of plans. This activity will support the development of a data sharing platform to integrate multiple data sources from different departments in Vinh Long. Proper institutional mechanisms and procedural guidelines for data sharing and updates will need to be developed, as well as strengthening the capacity to manage and use the data platform to support various city planning and management functions. In addition, this activity will also pilot community-based initiatives using mobile applications to improve real-time disaster monitoring and management such as flood and erosion.

- *Information system and equipment for improving Operation and Maintenance.* Most cities in Vietnam suffer from a lack of clarity of the institutional and funding arrangements as well as practical skills and experience for O&M, and Vinh Long is no exception. Investment in infrastructure maintenance is critical to reduce vulnerability to disasters and climate risks, reduce contingent liability and to ensure sustainable economic growth. This activity will develop an O&M strategy based on vulnerability assessments of the city's critical infrastructure, and identify suitable information systems for improving O&M. Operating departments of the newly invested infrastructure will be supported with appropriate equipment and capacity for O&M.

- *Effective transport management and equipment toward smart transportation system.* The objectives are to improve traffic management and integration of transport and flood management in the city. This activity will: i) integrate transport data with the city geospatial data sharing platform as mentioned above, to enable travel demand analysis as inputs to transport planning; ii) improve traffic safety through deploying intelligent transport systems (ITS), including installing traffic signals at intersections along the project corridors; iv) in coordination with DOT's ongoing proposal, install speed camera and vehicle weight control system within the city area; and v) enhance DOT staff capacity in the application of ITS in traffic management and transport planning.

35. *Project implementation support.* TA will be provided for: (i) the preparation of technical designs for infrastructure investments; (ii) independent monitoring of Environmental and Social Framework (ESF) standards; (iii) independent financial audits; and (iv) strengthening implementation capacity for project management, ESF standards, financial management, procurement, and monitoring and evaluation.

Project Beneficiaries

36. The project will directly and indirectly benefit over 140,000 residents of Vinh Long City. Residents will benefit from improved urban infrastructure that will reduce the risk of flooding, expand access to improved sanitation and hence improve public health, as well as reduce travel times on new and improved roads. The project will also improve connectivity with industrial parks and tourist attractions in the project city. This will benefit the workers and business persons as well as visitors traveling to and from the city. Provincial and city People's Committees also directly benefit from the technical assistance and capacity development activities for improved project management, geospatial data and information management, flood risk management, transport management, and O&M.

Proposed Project Cost

37. The total project cost is US$ 219.4 million, of which US$ 163.4 million will be financed by the WB Loan/Credit. The remaining US$ 56.0 million will be financed through counterpart funds from the PPC and CPC to finance land acquisition and compensation, technical assistance activities, project management, and other costs. The project cost by components is as follows:

Table 2: Proposed Project Cost (US$ million)

	WB	Counterpart Fund
Direct costs		
Component 1	93.3	-
1.1 Drainage system	*13.4*	
1.2 Wastewater collection and treatment	*39.0*	
1.3 Flood mitigation	*40.0*	
1.4 Flood risk management system	*0.9*	
Component 2	41.5	-
Component 3	4.9	27.6
Construction of resettlement site	*4.9*	
Site clearance & compensation	-	*27.6*
Component 4	2.4	6.4
Other costs and contingency		
Taxes, interest, fees	-	14.7
Contingency	21.3	7.3
Sub-total	163.4	56.0
TOTAL	**219.4**	

38. The Bank team is currently at early stage of discussion about a potential co-financing opportunity for selected investments related to wastewater collection and treatment under Component 1 with the DRIVE program from the Dutch Ministry of Foreign Affairs, being implemented by the Netherlands Enterprise Agency (RVO) on behalf of the Minister for Foreign Trade and Development Cooperation of the Netherlands, who is interested in providing a grant to co-finance the project.

Legal Operational Policies	Triggered?
Projects on International Waterways OP 7.50	Yes
Projects in Disputed Areas OP 7.60	No

Summary of Screening of Environmental and Social Risks and Impacts

39. The project environmental risks and impacts would mainly be related to the implementation and operation of the investments under Component 1 through Component 3 of the project. The bulk of anticipated impacts would be related to construction works and include common risks such as: (i) dust, noise, vibration, generation of solid wastes and wastewater; (ii) water quality reduction, localized flooding and related unhygienic conditions, disturbance to urban and canal/riverside landscape; (iii) interruptions to existing public services and infrastructure such as drainage, power and water supply, irrigation; (iv) road way and waterway traffic disturbance and increased traffic safety risks; (v) loss of some trees, vegetation cover and aquatic benthic species; (vi) health and safety risks to workers, etc. Most of these are mostly temporary, at low to moderate level and reversible, however, some incremental disturbance and safety risks to the affected parts of urban population, visitors and traffic, particularly at night time and in rainy season can be anticipated as some pipeline/road works would be carried out in the core urban areas while construction activities under the on-going SUUP would be implemented at the same time. In addition, there are also other specific risks and impacts related to the specialized characteristics of the project location and typology of construction activities such as safety risks related to UXO left from the war which ended in 1975, disturbances caused by excavation, dredging, pile driving, compaction in road works or at river embankments may cause damages to existing weak structures. Dredging of canals and rivers would also generate materials that could cause serious pollution if not properly handled, stored and disposed. There could be localized and temporary flooding, nuisance and visual impacts in relatively large areas covering construction site, temporary storage yards, along transportation route and final disposal sites. There is some risk of significant and/or irreversible impacts associated with the proposed works. The main risks and impacts during operation would result from permanent changes in land use and elevated local ground elevation at and/or along the new roads. The new roads may cause access disruptions and community fragmentation, changes in local drainage patterns, or increased levels of dust, noise, vibration and traffic safety risks. These could result from poor planning/design and a lack of consultation and stakeholder engagement during project planning/preparation and implementation. Induced development, such as new residential and commercial structures along new/improved urban roads would be expected, however with low to moderate impact within an existing urban zone. Regarding the wastewater collection and treatment systems, the main concerns during operation phase would be the risk of pollution due to system failure, particularly failures at pumping stations and the treatment plant. While the capacity has not been confirmed, the level of GHG emissions is yet uncertain either as it depends on the treatment technology and processes including gas capture and treatment. This will be determined during the detailed design phase (i.e. during further project preparation). Changes in landscape, disrupted access to water fronts from river/canal side, pollution and localized flooding caused by rainwater and domestic wastewater would be the main issues to be considered in relation to canal and river embankments construction and operation.

40. The comprehensive improvement to infrastructure in the urban core area related to the canal embankments, drainage system, and wastewater treatment system, strategic corridor development, and resettlement and compensation may require land acquisition, and there may be a need for relocation of households, as well as a temporary restriction of access to infrastructure and livelihood opportunities. Potential social risks and adverse impacts anticipated are mainly related to (i) the acquisition of land from 3,000 affected households, of whom roughly 500 households may have to be relocated or resettled within their existing land plot; (ii) the loss of agricultural land (intensive paddy production land) which will affect farmers' livelihoods; (iii) loss of assets on lands, business activities, and other properties; (iv) possible additional land acquisition, under city financed domestic projects, along the proposed extended Vo Van Kiet street, and along the urban main roads for future development may lead to a perception that these are associated with the World Bank financed project; (v) relocation of graves; (vi) the risk that city government units responsible for land acquisition and resettlement may not

have the capacity to deliver the land required for the project in a timely fashion, and the development of the Resettlement Site will not be ready on time; (vii) the risks and impacts on community health and safety due to construction works (wastewater, dust, noise) and operation (traffic accidents), and related risks from the influx of labor to low income project areas, characterized by poor and vulnerable residents, during construction (e.g. Gender-based violence, sexual exploitation and abuse, and the spread of sexually transmitted and communicable diseases); (viii) increase of conflict between users in wastewater discharge connection; and (ix) uneven access to project benefits among vulnerable groups such as poor households, female headed households, elderly and disability.

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