



## 1. Project Data

**Project ID**  
P119077

**Project Name**  
VN-Urban Water Supply and Wastewater

**Country**  
Vietnam

**Practice Area(Lead)**  
Water

**L/C/TF Number(s)**  
IBRD-86210,IDA-49480,IDA-58170,TF-56904

**Closing Date (Original)**  
30-Dec-2016

**Total Project Cost (USD)**  
266,451,940.87

**Bank Approval Date**  
24-May-2011

**Closing Date (Actual)**  
31-Dec-2019

	<b>IBRD/IDA (USD)</b>	<b>Grants (USD)</b>
Original Commitment	200,000,000.00	0.00
Revised Commitment	295,371,577.00	0.00
Actual	266,452,159.93	0.00

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## 2. Project Objectives and Components

### a. Objectives

According to the Financing Agreement (FA, p.5) and the Project Appraisal Document (PAD, paragraph 12), the Project Development Objective (PDO) was to increase access to sustainable water services and environmental sanitation in selected urban areas in the Project Provinces.

This review assesses the achievement of the following objectives:



- to increase access to sustainable water services in selected urban areas in the project provinces.
- to increase access to sustainable environmental sanitation in selected urban areas in the project provinces.

Although the PDO outcome indicators were revised during restructuring, the level of ambition increased at significant levels that were commensurate with the approved Additional Financing (AF, see below). As a result, a split rating was not applied to the outcome.

**b. Were the project objectives/key associated outcome targets revised during implementation?**

Yes

**Did the Board approve the revised objectives/key associated outcome targets?**

No

**c. Will a split evaluation be undertaken?**

No

**d. Components**

**Component 1. Investments and Project Implementation** (At appraisal: Cost: US\$232.4 million, of which IDA - US\$ 197.0 million and counterpart financing - US\$35.4 million; At Completion: Cost: US\$345.68 million, of which IDA - US\$ 310.28 million and counterpart financing - US\$35.4 million)

**Subcomponent 1A: Water Supply** (US\$109.5 million at appraisal, revised to US\$106.6 million during the restructuring, and US\$108.13 million actual). This component would finance an expansion of the water networks, increase house connections for water, and increase in the water treatment and storage capacity in seven cities and towns across seven provinces. These were Uong Bi town in Quang Ninh province, Ninh Binh city in Ninh Binh province, Tam Ky city in Quang Nam province, Da Lat city in Lam Dong province, My Phuoc in Binh Duong province, Duong Xoai town in Binh Phuoc province and Phu Quoc in Kien Giang province. In addition, this component would finance technical assistance to design and prepare bidding documents, supervise construction, ensure compliance with environmental and social safeguards, and perform fiduciary functions of financial management and procurement. This component would also finance consulting services to generate an Operational Improvement Plan for each water sub-project designed to strengthen each utility's management capacity and improve operations. This component would also finance two surveys—one at the start of the project and another at project closing—to rate gender disaggregated consumer satisfaction on services delivered.

**Subcomponent 1B: Environmental Sanitation** (US\$122.9 million at appraisal, revised to US\$233.5 million during the restructuring, and US\$237.55 million at completion). This component included activities to increase wastewater collection and treatment capacity, expand drainage in flood prone areas, and increase the number of house connections to the sewer networks as contained in Strategic Sanitation Plans (SSPs) to be prepared for each participating city or town. The cities and towns included were Ninh Binh city in Ninh Binh province, Tam Ky city in Quang Nam province, Da Lat city in Lam Dong province, Duong Xoai town in Binh Phuoc province, Bim Son town in Thanh Hoa province, Dong Ha city in Quang Tri province, and Thai Hoa town in Nghe An province. The city of Di An town in Binh Duong province was added at the Additional Financing (AF) in May 2016. In addition, this component would finance consulting services to prepare the SSPs and detailed design and bidding documents, supervise investments activities, ensure compliance with



environmental and social safeguards, and perform fiduciary functions such as financial management and procurement. Similar to the water sub-projects supported under the first component, this component would also finance the preparation of an Operational Improvement Plan for each sub-project to strengthen management capacity, improve operations and conduct two customer satisfaction surveys—at the start and closing of the project.

**Component 2: Technical Assistance** (cost at appraisal: US\$3.8 million, of which IDA - US\$3.0 million and counterpart financing - US\$0.8 million; at completion: US\$11.10 million, of which IDA - US\$10.0 million and counterpart financing - US\$1.1 million).

**Subcomponent 2A. Institutional Strengthening and Project Monitoring** (US\$2.30 million at appraisal and at completion). This component would finance the Ministry of Construction's (MOC's) efforts to develop a sector database with associated regulations that would monitor the performance of companies; guide provinces in developing their respective SSPs; and help these provinces identify least-cost options in collecting and treating wastewater and establishing investment priorities for water and sanitation sector accompanied by financing plans. This component would also finance a study tour to learn about best practices in water and sanitation service delivery and project monitoring to be conducted by the MOC.

**Subcomponent 2B. Improving the Efficiency of Investments and Operations** (US\$1.5 million at appraisal and at completion). This component would finance consulting services delivered to the Ministry of Planning and Investment (MPI) to develop two circulars. The first circular on wastewater tariff would help increase the financial viability of sanitation companies by applying cost recovery principles to their operations. A second circular on Operational Improvement and Investments Needs would outline the role of the private sector to improve operational efficiency in the sector. In addition, consulting services would facilitate the issuance of an MPI ministerial decision for private sector participation in project areas. This ministerial decision would review options, identify a pilot province where a private sector transaction would be implemented, and prepare a "Private Sector Participation Tool Kit."

**Subcomponent 2C. Water Sector Priority Investment Plan** (US\$7.30 million added at restructuring; US\$7.30 million at completion). This component was added to the project scope at the Additional Financing in May 2016 for the preparation of investment studies related to water supply sources in six Mekong Delta provinces of An Giang, Soc Trang, Bac Lieu, Ca Mau, and Kien Giang, as well as the city of Can Tho. These studies would identify options to improve water supply schemes that were vulnerable to climate change variability, sea level rise, and salinity intrusion to those that would address subsidence risk in the Mekong Delta.

#### **e. Comments on Project Cost, Financing, Borrower Contribution, and Dates**

**Project Cost and Financing:** The project cost at appraisal was US\$236.2 million with IDA credit of US\$197.0 million and US\$35.4 million as borrower contribution. Additional financing in May 2016 added US\$119 million comprising IDA credit of US\$50 million and an IBRD loan of US\$69 million. At completion the cost was US\$356.68 million, comprising US\$310.2 million from IDA, US\$10 million from IBRD, and US\$36.5 million from counterpart funding.

**Dates and restructurings:** The project was approved on May 24, 2011 and became effective on October 7, 2011. A Mid-Term Review (MTR) was conducted on January 12, 2015. The original IDA loan was closed



on December 31, 2017; one year after the original closing date of December 31, 2016. The IDA credit and International Bank for Reconstruction and Development (IBRD) loan approved at the Additional Financing (AF) in May 2016 closed on December 31, 2019. In addition to the AF, there were two more Level 2 restructurings (ICR, paragraphs 20 and 34):

- **Additional Financing and First Restructuring (Level 1 - May 26, 2016):** The first restructuring provided an e(US\$50 million of IDA credit and US\$69 million from IBRD loan) to finance (i) the cost overruns of US\$20 million due to the appreciation of the US\$ against the SDR; (ii) a new wastewater drainage project (US\$92 million) in the town of Di An in Binh Duong Province; and (iii) the preparation of the Mekong Delta Water Supply Investment Plan (US\$7 million). The project closing date for the AF was December 31, 2019. Because of the increase in the project scope, the Results Framework was amended as follows:
  - Target values of three outcome-level indicators were revised: (i) number of new piped household connections from 42,628 to 65,872; (ii) number of people who have improved sanitation from 263,051 to 312,051; and (iii) the increase in the satisfaction rate of beneficiaries from a baseline of 72 percent to 80 percent, both of which were specified at the AF.
  - Three new outcome-level indicators were added: (i) number of direct beneficiaries with a target value of 450,382; (ii) number of female beneficiaries with a target value of 51 percent of the total direct beneficiaries; and (iii) increase in the satisfaction rate of beneficiaries of wastewater and drainage services in Di An town from 25.21 percent of baseline to 80 percent. (This was an indicator specific to Di An town added to the project scope at the AF.)
  - Two intermediate outcome indicators were revised: (i) the baseline of volume of water sold annually was defined as “zero” without a change in the target value of 21.7 million cubic meter; and (ii) the target value of areas benefiting from increased drainage coverage and flood protection measures was increased from 12,564 hectare (ha) to 12,618 ha.
  - Two new intermediate outcome indicators were added: (i) preparation of the Mekong Delta water supply investment plan; and (ii) volume of Biologic Oxygen Demand (BOD) mass—BOD is a water quality parameter measuring the amount of organic matter, or “food,” available in wastewater for oxygen-consuming bacteria; a lower BOD ratio means wastewater is less harmful to the environment—removed by the wastewater treatment plant in Di An town.
- **Second Restructuring (Level 2 - December 26, 2016):** The closing date of the original IDA credit loan was extended from December 31, 2016 to December 31, 2017. The closing date of the AF remained at December 31, 2019. According to the Task Team (email to IEG dated August 13, 2020), the legal agreement for the AF above indicated that the entire project would close on December 2019. However, the Prime Minister's Office instructed that activities prior to the AF should maintain their original closing date of December 31, 2016. Finally, due to delays in approving the AF financing agreement, and delays in accessing AF resources to complete the original activities, the original closing date was extended as requested.
- **Third Restructuring (Level 2 - November 29, 2019):** An unused credit of US\$24.42 million was cancelled, and some proceeds were reallocated among disbursement categories. Funds were underutilized “because of delays in allocating Official Development Assistance (ODA) to provinces caused by the fiscal situation at the time as well as lengthy processing time for approval of additional project activities” (ICR, p.15).



### 3. Relevance of Objectives

#### Rationale

The project development objectives (PDOs) were relevant to the country's development priorities as stated in "Vietnam 2035 Vision" and the country's Social Economic Development Plan (SEDP) for 2016-2020. The PDO would contribute to the SEDP goals for 2020, where 95% of the urban population and 90% of rural population would have access to clean, sanitary water (Section III, Goals, Targets, and Breakthroughs). The PDO was also relevant to the Government's plan to construct improved infrastructure systems in urban areas (Section V, Tasks and Major Solutions, p. 93) and respond to risks from climate change and natural disasters through enhanced natural resource management and environmental protection (p.105).

The PDOs were relevant to the country's goal of achieving water security by contributing to sustainable management of its water resources. A 2019 World Bank study, *"Towards a Safe, Clean, and Resilient Water System"* pointed out that by 2030, urban development, an increase in competing demand for water, and discharge of untreated wastewater would pose stresses to 11 of the 16 river basins in Vietnam. For example, the country's Ministry of Construction confirmed that only 46 percent of urban households were connected to the drainage system and only 12.5 percent of domestic wastewater was treated. If unchecked, these challenges to water quality and productivity, including the impact from climate change on water-related disaster risks such as subsidence and flooding could cost the country up to 3.5 percent per year of its Gross Domestic Product by 2035. The study suggested policy actions and roles for the public and private sectors in effective and sustainable water management. The PDOs were relevant in addressing the development problem of achieving water security. In addition, this project included a private sector participation (PSP) toolkit and a pilot PSP for the Binh Duong Water Supply, Sewerage, and Environmental Company (BIWASE) (see Section 4, Efficacy below).

The PDO also remained relevant to the World Bank Group's (WBG) Country Partnership Framework (CPF) for FY18-FY22. The CPF focused on the gains offered by urbanization, and aimed to increase productivity growth, competitiveness, and inclusiveness. The WBG supported the Government's efforts to strengthen urban planning, management, and governance. The CPF looked to boost capacity to deliver high-priority infrastructure and strengthen the system of cities. In particular, the engagement would strengthen institutional governance in the water sector, clarify roles and responsibilities, and promote integrated management of water resources. In addition, the WBG support would strengthen private sector participation in the sector—both as a provider of water services and as an investor. The PDO would contribute to achieving objectives under Focus Area 1 (enable inclusive growth and private sector participation), such as objective 1 (strengthened economic governance); objective 2 (promote private sector development); and objective 4 (improve planning, management, and delivery of infrastructure and land in cities). The PDO would also contribute to achieving goals under Focus Area 3 - Ensure Environmental Sustainability and Resilience through objective 9 (to promote low carbon energy generation, and reduce greenhouse gas (GHG) emissions (by way of the pollution management aspect of the PDO) and objective 11 (to strengthen natural resource management and improve water security (CPF, paragraph 83).

At appraisal, the World Bank was already engaged in the water supply and sanitation sector in the country through the Vietnam Water Supply Development Project (P073763), which was a similar project with the objective to improve water and household sanitation services in selected district towns and large urban centers. This current project benefited from the experience gained in the first project and targeted medium-



size towns with potential to grow in terms of population because of rapid urbanization. Therefore, given the World Bank's experience in the sector and the country, the project objectives were adequately challenging.

## Rating

High

## 4. Achievement of Objectives (Efficacy)

### OBJECTIVE 1

#### Objective

To increase access to sustainable water services in selected urban areas in the project provinces.

#### Rationale

The Project Appraisal Document (PAD) did not present a theory of change (ICR, paragraph 6). However, the main causality chains leading to achievement of the PDO were provided in the Results Framework (PAD, Annex 1) and the description of the project components (PAD, paragraphs 22-33) as follows: *First*, the new piped water connections, the improved service availability, and the increase in treatment plants and storage capacity together were expected to lead to an increase in the volume of water sold to a number of urban households in the targeted project area. This first causal chain represented the technical sustainability of delivering sustainable water services. The *second* causal chain indicated that the piloting of a toolkit for private sector participation, and the functional roll-out of a sector database would be expected to result in the implementation of a Private Sector Participation sub-project and thereby also add new connections. This second causal chain represented the institutional sustainability of delivering sustainable water services. The *third* causal chain related to setting adequate tariffs that would cover operation & maintenance (O&M) and depreciation costs for water utilities, effect improvements in revenue collection, or reductions in non-revenue losses that would lead to financial sustainability of water utilities and water service delivery. These activities, outputs, and intermediate outcomes would lead to two main final outcomes that signal the achievement of the PDO: (i) an increase in the number of direct beneficiaries with access to safe water and improved health and well-being; and (ii) lower costs of water access and sustainable water services. The project's Theory of Change (TOC) was premised on assumptions tested during implementation: (i) the government would expand the capacity of the water treatment plant and expand its distribution network; and (ii) at the central level, a ministerial level decision would be made for private sector participation. The TOC was valid, with logical causality chains that included activities that were based on reasonable assumptions, and were comprehensive, adequately scaled and properly sequenced.

#### OUTPUTS:

The following output targets were met or exceeded:

New piped household water connections and direct beneficiaries: As a result of the completion of the water supply sub-projects in seven towns, i.e., water treatment facilities and distribution networks, 80,173 households (covering 358,324 direct beneficiaries) were provided with new piped household water





connections (baseline 4,366 households, original target 42,628 households, revised target 65,872 households/263,488 direct beneficiaries). The revised target was significantly exceeded despite the depreciation of the SDR against the US\$, which was compensated by the AF and by utilities combining their funds from other sources (ICR, footnote 13). Early completion (by February 2016) of infrastructure construction and higher than expected availability of water enabled the utilities to shift focus to increasing household water connections that resulted in a higher number of connections (ICR, paragraph 45).

Additionally, female beneficiaries constituted 40 to 52 percent of direct beneficiaries (target 51 percent, target achieved by one province (Tam Ky) and almost achieved in four provinces (Ninh Binh, Phu Quo, Da Lat, and Dong Xoai) while not achieved in two (Uong Binh and My Phuoc). According to the ICR (paragraph 93), the percentage of females living in the project service area was overestimated. Females constituted 48 percent of beneficiaries according to the July 2017 survey and 44 percent in the March 2000 survey.

#### Private sector participation

- The Ministry of Investment and Planning (MIP) adopted criteria for selecting Private Sector Participation (PSP) projects.
- A PSP toolkit was developed as targeted but a circular on the use of PSP in operating and managing water supply services was not yet issued at closing (ICR, paragraph 68).

#### Planning and investment studies

- The Ministry of Construction (MOC) developed a functional sector database.
- The Mekong Delta Water Supply Investment studies, which were added under additional financing covering the six Mekong Delta provinces of An Giang, Soc Trang, Bac Lieu, Ca Mau, Kien Giang, and the city of Can Tho, were not completed, but design options are available.
- Water security priority investments studies were prepared but not finalized at closing. They are likely to be completed after closing.

### **OUTCOMES:**

Infrastructure service delivery targets were achieved or exceeded:

- The water treatment capacity increased from 2,089,000 cubic meters per year (cu m/year) in 2011 to 27,605,000 cu m/year in 2017 (ICR, paragraph 45). There was no target set related to increase in water treatment capacity.
- Volume of water sold by the utilities: This increased to 27,605,000 cu m/year against a target of 21,731,000 cu m/year at AF, and a baseline of 2,089,000 cu m/year.
- 97.80 percent of water supply service beneficiaries expressed satisfaction with the water supply services received (baseline 86.3 percent, target 90 percent, target exceeded). Satisfaction with service delivery was expressed in terms of improved water pressure, continuity of service, water quality (no chlorine smell and no turbidity) and customer service (ICR, paragraph 46).

Sustainability and efficiency indicator targets were achieved:



- All utilities achieved the target of less than 0.9 financial working ratio (operating costs (excluding depreciation and amortization) divided by revenue collected), except Uong Bi, which was marginally higher at 0.92.

#### Private sector participation

- Based on the PSP criteria, the Ministry of Planning and Investments (MPI) selected the Binh Duong water supply sub-project to increase its water treatment capacity using a pilot private sector participation (PSP) arrangement with the Binh Duong Water Supply, Sewerage, and Environmental Company (BIWASE), a public company and a private firm from Binh Duong. However, BIWASE was converted from a state-owned enterprise into a public corporation (or “equitized” in Vietnam’s terms). Because the AF had limited resources for water sub-projects, BIWASE secured commercial funds for increasing water treatment capacity. Tariffs collected from water sales were used to repay the private loan. The Bin Duong water utility was the only water utility listed on the Vietnamese Stock Exchange (ICR, paragraph 68).

#### Mekong Delta water supply investment:

- At closing, following the completion of the water security priority investment studies for the six Mekong Delta provinces and the city of Can Tho, the Ministry of Construction (MOC) was still considering which option to implement – a regional or a provincial infrastructure. The investment options have been submitted to the Prime Minister’s Office for approval (project task team’s email to IEG dated August 13, 2020.) The technical assistance would identify options to improve the present water supply schemes in the provinces of the region that relied primarily on systems vulnerable to climate change variability, sea level rise, salinity intrusion, and declining ground water levels. These factors accelerated the subsidence risk of the Mekong Delta.

The efficacy of the achievement of Objective 1 was rated high; the project fully achieved or exceeded its intended outcome of increasing access to water services, while achieving financial sustainability parameters, and the PSP pilot resulted in Bin Duong water utility being listed in the stock exchange.

**Rating**  
High

## **OBJECTIVE 2**

### **Objective**

To increase access to sustainable environmental sanitation in selected urban areas in the project provinces.

### **Rationale**

**Theory of Change:** Capacity of wastewater treatment plants would be increased, sewer networks and drainage systems would be built, extended, and households connected to the sewer network. The drainage system would be expanded, and urban residents in the target area were to be connected to improved sanitation. A target area (expressed in hectares) would be provided with drainage and flood protection measures. The AF financed the construction of the Di An Town Wastewater Treatment Plant, and a target volume of biological oxygen demand (BOD) would be removed from wastewater. For sanitation sub-projects,





tariffs would be collected to recover at least O&M costs (ICR, paragraph 9). The project would develop two policy support circulars regarding cost recovery tariffs and financial management. These factors would address the financial sustainability of delivering sanitation services in the target urban areas. These activities would lead to the following outputs: increase in the capacity of wastewater treatment, increase in the capacity of the sewer network and drainage in flood prone areas, and increase in the number of households connected to the system. These outputs would lead to intermediate outcomes such as increase in the volume of wastewater collected, increase in the volume of BOD removed from collected wastewater, increase in the number of residents benefiting from wastewater services, increase in the area covered by drainage and flood protection, and in Di An town only, an increase in the rate that beneficiaries were satisfied with the services. The following assumptions were made in the wastewater sector: wastewater treatment plants and sewerage networks and drainage systems would be completed, and at the central level, circulars on wastewater tariffs, operation improvements, and investments needs would be developed. Sustainability of the wastewater sub-projects was not part of the results framework nor were these added at restructuring but were discussed in the ICR (paragraphs 58-68; see also below under Outcomes).

However, the theory of change did not include an intervention to facilitate household connections to the sewage system by supporting households to “change internal plumbing, move or build manholes, and repair interior floors” (ICR, paragraph 56). Additionally, the project did not include an information and education campaign to raise awareness about the benefits of household connections to sewage system.

## **OUTPUTS:**

The following targets for infrastructure provision were exceeded:

- In Di An town, 6,268 new household connections were achieved (baseline, 0, target, 6,000)
- The volume of Biological Oxygen Demand (BOD) mass removed at the WWTP reached at 1,600 kg/day (baseline 0, target 1,020 kg/day).

The following targets for infrastructure provision were fully or partially achieved:

- 152,928 urban residents benefited from improved sanitation (baseline 0, original target 263,051 residents, revised to 312,051 residents). The lower number of household connections were due to the following: (i) In some areas, constructing the treatment plants and sewer network was prioritized over establishing household connections – for instance, in Da Lat, the construction of the WWTP and sewer network was prioritized over establishing household connections, and the volume of wastewater collected and treated remains at about 45 percent of the total installed capacity; (ii) In others, wastewater would need to be pumped because houses were located below the sewer lines. Therefore, households opted to continue to use their septic tanks instead; (iii) Although connecting to the sewer lines was free-of-charge, households would have to bear the cost of a change in internal plumbing, move or build new manholes, or repair floors; and (iv) In households with combined systems (drainage and sewer) that discharged wastewater to the public drains, they were reluctant to connect anew (ICR, paragraph 56).
- In Di An Town, 25,072 residents directly benefited from the sub-project (baseline, 0, target, 49,000)
- Flood protection measures (with no targets provided) included raising river embankments, building drainage canals, pumping stations, and hardened embankments around storm water detention water bodies. In Dong Ha, three large storm water detention ponds were created to capture a combined 140,000 cubic meter of storage. This capacity addressed flooding across 369 hectares of urban land.



Flooding occurred during the rainy season (September to December). Floods could be as high as 1.5 meters. This flooding level was reduced but no figure was reported.

Planned investment plans and studies were completed:

- Strategic Sanitation Plans (SSPs) were completed for each sanitation sub-project to inform sub-project feasibility studies for proposed new connections.
- Sustainability of wastewater and drainage sub-projects (technical, financial, and institutional) were **not** included in the Results Framework. However, the Monitoring and Evaluation (M&E) system established by the project helped central and local agencies monitor sector development to inform the sustainability aspects of the sanitation sub-project investments.
- The Ministry of Planning and Investments (MPI) prepared a circular on methods for estimating and implementing wastewater tariff. The Ministry of Construction (MOC) issued this circular at the national level. Seven of the eight Provincial People's Committees (PPCs) have agreed to charge all customers wastewater tariff.

## OUTCOMES:

Environmental services delivered exceeded targets:

- 72 percent of customers expressed satisfaction with services received (baseline 60.4 percent, target 70 percent).
- 70 percent of Di An wastewater treatment plant customers expressed satisfaction with the drainage and wastewater services received (baseline 25.21 percent, target 50 percent)

Targets for environmental services were fully or partly achieved:

- 8,582 hectares (or 68 percent of the revised target area) benefited from drainage coverage and flood protection measures (baseline 0, original target 12,564 hectares, revised target 12,618 hectares). According to the ICR (paragraph 57), the target was not achieved because even after being informed by the SSPs and discovering that the target area for drainage sub-projects was lower than determined at appraisal, the AF did not reduce the target. However, the evidence supported the argument that the groundwork has been laid and therefore there is a likelihood that the target would be achieved after the project closed (ICR, Box 2),
- The flood protection measures mentioned above were anecdotally reported to have reduced the risk of flood related damage, improved the drainage of storm water, and assumed an increase in property values in the project area. In Dong Ha, the improved capacity from the storm water detention ponds addressed flooding during the rainy season (September to December) across 369 hectares of urban land. The ICR did not provide the figure for the reduced flooding level. In Dong Ha, polluted and visually unappealing marshlands were transformed by deepening the lake to improve the water storage function of the area and shoring up the sides. The lake perimeter was developed with walking paths, roads, and parks resulting in 20 hectares of new public space, with handrails, landscaping and lighting around the lake. Many of the amenities were financed by the city. Land value surrounding the area were anecdotally reported to have increased by about 500 percent for plots around the lake and 10 percent for adjacent ones. The public spaces were used for recreational activities (ICR, Box 2).
- (i) Operations and maintenance (O&M) activities of the treatment plants: Two technological systems were implemented. One was the simpler biological pond treatment technology, which removed BOD



load from domestic wastewater to comply with discharge standards. Another was the more complex one, which required an anaerobic filtration system and activated sludge in sequencing batch reactors (SBRs). In this technology, wastewater was added to a single batch reactor, treated to remove undesirable components, then discharged. Periodic activities were conducted, such as monitoring the components, measuring water quality at discharge points, and comparing volumes of inflows/outflows. (ii) The quality of effluents from the wastewater treatment plants: All wastewater sub-projects met Category B discharge water quality standards defined by the Ministry of Natural Resources and Environment (MONRE). All were given permits to discharge effluents into the environment.

Results for financial and institutional sustainability were inconclusive:

- Financial sustainability of wastewater and drainage sub-projects were to be supported by wastewater tariffs and available government subsidies. The Da Lat sub-project had been charging wastewater tariffs since 2013 under a donor-funded project. The remaining six wastewater utilities approved wastewater tariffs but have not collected these because wastewater treatment facilities commissioned these facilities only in 2018. The Provincial People's Committee (PPC) first needed to revoke the 10 percent environmental surcharge to water supply customers. This 10 percent surcharge represented cost recovery payment for wastewater treatment and drainage. These fees were not collected by the wastewater provider; instead they were collected by the government and transferred to the provincial treasurer, which did not necessarily mandate its use for O&M needs. The PPCs and City People's Committees (CPCs) committed to financing O&M of wastewater treatment plants and drainage systems. Provinces allocated funds as part of their annual budget planning (ICR, paragraph 63). Financial sustainability could not be claimed at project closing.
- Institutional sustainability of wastewater and drainage sub-projects was supposed to have been provided through efforts to strengthen existing Urban Environmental Companies (URENCOs). These entities were originally assigned asset ownership and O&M of wastewater and drainage system. With institutional changes introduced in 2016, PPCs and CPCs assigned asset ownership to a separate internal entity who then signed O&M service contracts with URENCOs. In Di An and Thai Hoa, however, the water supply and sewerage utility, retained O&M functions for wastewater and drainage. Most wastewater companies reported to or operated under a contract with a PPC and were responsible for O&M of the drainage system. Institutional sustainability could not be claimed at project closing.

The outcome for this objective was rated modest because, although the targets for increasing access to environmental services—flood protection, drainage, and wastewater treatment—were partially achieved by project closing, results for financial and institutional sustainability were inconclusive. The sustainability of wastewater and drainage services, although not defined at appraisal or AF (ICR, paragraph 58) were assessed using available information, including from the sector database that was last updated in 2015 (ICR, paragraph 53).

**Rating**  
Modest



## OVERALL EFFICACY

### Rationale

The project's efficacy in achieving the first objective was high, having met or exceeded the targets for the outcome indicators. The project's efficacy in achieving the second objective was modest, based on important shortcomings in meeting targets as well as other weaknesses in performance. The overall efficacy was rated substantial taking into account government commitments to address the shortcomings in relevant targets (e.g., the decision regarding the Mekong Delta water supply investment was in the Office of the Prime Minister, an agreement had been reached with the Provincial People's Committees regarding the implementation of the wastewater tariff, the provincial and city level People's Committees have allocated funds to finance O&M of wastewater treatment plants and drainage systems). Also, the capacity was established to support future water and sanitation connections, and foundations were put in place for the institutional, technical, and financial sustainability of the services. These factors point to the shortfalls being addressed in the near term to justify the substantial overall efficacy.

### Overall Efficacy Rating

Substantial

## 5. Efficiency

**Economic and Financial Efficiency:** At appraisal, cost effectiveness, economic, and financial analyses were conducted to the water sub-projects while economic analyses were undertaken for the wastewater sub-projects. Cost effectiveness was based on costs per beneficiary. This measure was commonly used for assessing the economic and financial efficiencies of wastewater and drainage projects.

At appraisal, the project committed to a maximum of US\$200 per capita. For water sub-projects, the per capita cost effectiveness ranged from a low of US\$72 (Da Lat) to US\$196 (My Phuoc) while for wastewater sub-projects, the per capita cost effectiveness ranged from US\$88 (Da Lat) to US\$201 (Bim Son).

At appraisal, benefits from the water sub-projects were reflected in the value of the incremental volume of water sold against the corresponding costs. Tariffs paid were used as proxy for the value of water (PAD, paragraph 46). The economic rate of return (ERR) for water sub-projects ranged from 6.3 percent (Dong Xoai) and 9.4 percent (Phu Quoc) to 15.3 percent (My Phuoc). Two of the 5 sub-projects had lower than 10 percent in ERRs because the cost of investments included a change in the water source and the building of a new transmission system (Dong Xoai) and upgrading the transmission system Phu Quoc (PAD, paragraph 47).

At appraisal, benefits came from improved sanitation valued at a rate based on a 2008 World Bank/World Sanitation Program study called *Environmental Impacts of Sanitation in Vietnam* and was assumed to increase at 2 percent a year as the level of income increased. The ERR for wastewater sub-projects ranged from 9.5 percent (Dong Ha, Tam Ky) to 13.7 percent (Ninh Binh). The ERR for wastewater sub-projects assumed: (i) US\$0.10 per cubic meter of wastewater treated to indicate the costs of investing and operating wastewater treatment plants, and (ii) US\$28 as the annual per capita benefits of improved sanitation based on the earlier mentioned 2008 study.



At closing, the average ERR for water sub-projects was at 17.8 percent, ranging from 6.2 percent (Tam Ky) to 26.3 percent (My Phuoc). The average ERR for wastewater sub-projects stood at 22.8 percent, ranging from 18.2 (Tam Ky) to 31 percent (Dong Xoai). The ERR for wastewater assumed that by 2018 the per capita value of the benefits from improved health and water resource degradation would reach US\$44 per capita.

At closing, cost effectiveness improved because of population growth and gains from project management. For water sub-projects, cost effectiveness ranged from a low of US\$52 per capita (Da Lat) to a high of US\$112 (Tam Ky). For wastewater sub-projects, the per capita cost effectiveness ranged from US\$39 (Da Lat) to US\$196 (Di An). These figures were well within the US\$200 cost effectiveness maximum that was committed at appraisal.

**Operational and Administrative Efficiency:** Delays during the early stages of implementation resulted in low disbursements. This was due to a change in project design. Target urban areas were changed from two large cities (Ho Chi Minh and Hanoi) to ten mid-size cities. Implementing agencies lacked experience in managing wastewater treatment investments. Each city was required to prepare a Strategic Sanitary Plan (SSPs) before implementing its wastewater and drainage sub-projects. Additional steps such as establishing or updating master plans and conducting feasibility studies prior to undertaking detailed designs and bidding documents for sanitation sub-projects contributed to this delay and resulted in the modest outcome in household wastewater connections. In 2016, the government restricted the use of Official Development Assistance (ODA) to reduce its public debt because the country has reached its borrowing ceiling from multiple multinational development institutions. Sub-projects with limited funds could not pay their contractors on time, leading to a delay in project completion. At closing, US\$24.42 million was cancelled due to delays introduced by internal government procedures requiring the inclusion of project funds in the Midterm Investment Plan.

Even with the operational and administrative shortcomings, overall efficiency was rated substantial because of the high ERRs for both the water and wastewater sub-projects, representing 96.9 percent of total project cost at closing. The figure used below refer to the average ERR of the wastewater sub-projects (reaching 22.8 percent), covering US\$237.55 million of the total project cost of US\$356.78 million at closing. There was no comparable average ERR for wastewater sub-projects at appraisal.

## Efficiency Rating

Substantial

a. If available, enter the Economic Rate of Return (ERR) and/or Financial Rate of Return (FRR) at appraisal and the re-estimated value at evaluation:

	Rate Available?	Point value (%)	*Coverage/Scope (%)
Appraisal		0	0 <input type="checkbox"/> Not Applicable
ICR Estimate	✓	22.80	66.60 <input type="checkbox"/> Not Applicable

\* Refers to percent of total project cost for which ERR/FRR was calculated.





## 6. Outcome

The relevance of objectives was rated high. The efficacy of the project in achieving first objective was rated high. The project's efficacy for the second objective was rated modest. The overall efficacy was rated substantial. Efficiency was rated substantial. The outcome is rated satisfactory.

### a. Outcome Rating

Satisfactory

## 7. Risk to Development Outcome

The following pose risks to the development outcome:

- **Financial risk with regard to adequacy of financial flows and financial viability of wastewater utilities.** Only one of the eight wastewater utility was experienced in collecting established tariffs. Tariffs for the remaining wastewater utilities, some of which were state-owned at the city level and some a subsidiary of a water utility, were approved by their respective PPCs before project closing. These fees were earmarked for O&M needs of the wastewater utility assets. Actual implementation may be delayed because current water user fees include environmental surcharges. These need to be revoked first and then a separate wastewater tariff introduced. The government anticipated continuing its subsidies to all wastewater companies.
- **Stakeholder risk in connecting to wastewater services.** The slow progress in wastewater connections during implementation may continue. Households that use septic tanks or public drains and appeared to be unaffected by wastewater discharge are not connected to the wastewater collection network. In most sub-projects, project funds were used to connect households. After closing, cities may not have funds to assist those households that are connected to the system. To mitigate this risk, provincial and central governments would need to subsidize wastewater companies to expand wastewater connections, in addition to providing subsidies for O&M needs.
- **Institutional support risk from a lack of instruments and regulatory oversight to accompany recently equitized water supply utilities.** Urban water utilities were equitized during project implementation. The water utilities became public corporations that owned assets and could decide on investments, such as expanding its service. However, there were no institutional arrangements or instruments established to accompany how these public corporations would meet the water utilities' obligations to deliver water services. To mitigate this risk, the government may need to assign a government entity to supervise these water utilities, provide guidance regarding expansion plans for optimal and equitable water service delivery, and require them to report on their performance (see below).
- **Technical risk in the use of the M&E database.** According to the ICR, the database developed under the project was not regularly updated (ICR, paragraph 127). The last known update was made in 2015 (ICR, paragraph 53). When the water utilities were equitized, they were not provided incentives nor were they mandated to report on their performance. This database was designed to link these capital projects to sector wide long-term planning. With the information from this database, the government could determine appropriate investments and design actionable policies that promote accountability and transparency in the sector (ICR, paragraph 8). To keep the database useful, the





government could consider using its continuing subsidies as incentive for the water and wastewater utilities to regularly report on their performance or include the obligation in new policy directives.

## **8. Assessment of Bank Performance**

### **a. Quality-at-Entry**

The Bank's project design responded to the government's request and was relevant to achieving the country's objectives for the urban water and wastewater sectors. Project design included relevant lessons from six similar projects implemented in Vietnam. Among the lessons that influenced the design were: (i) a lack of prepared sub-projects could lead to implementation delays; (ii) signing subsidiary legal agreements for sub-projects could face time lags; (iii) connecting households to services could take time; and (iv) decentralized implementation works well for providing water and wastewater services. To avoid implementation delays, design included the following: (i) Provincial People's Committees (PPCs) approved sub-project feasibility studies prior to appraisal; (ii) subsidiary agreements for sub-projects were to be signed within 90 days after the signing of the Financing Agreement for inclusion in the project; (iii) the project would finance household connections for water and wastewater services; and (iv) implementation would be decentralized. (PAD, paragraph 36). However, the project area was changed from two major cities (Ho Chi Minh and Hanoi) at concept to ten smaller cities (with populations between 58,000 and 212,000 residents) at approval. All the new ten cities required Strategic Sanitation Plans (SSPs) for wastewater and drainage before approving these sub-projects. Design did not include information and education campaign activities that could have been useful for persuading more households to connect to wastewater services. Project components were reasonable to achieve the objectives stated. Counterpart funds were committed. At appraisal, a high risk was noted because provinces were unfamiliar with World Bank processes, the wide geographical spread of sub-projects, expected delays from land acquisition, and uncertainty in implementing tariffs for the services. The risk that households would not connect to the wastewater services, the possibility that technical design may pose problems, or that the country would reach its borrowing ceiling and that the government would impose limitations in the use of Official Development Assistance (ODA) funds from all sources, were unforeseen risks that nevertheless became evident during implementation.

### **Quality-at-Entry Rating**

Moderately Satisfactory

### **b. Quality of supervision**

The Bank project team conducted 17 semi-annual supervision missions over the eight-year implementation period. Supervision inputs were adequate. For example, in the case of environmental safeguards, the Bank team worked closely with the implementing entities to ensure that the clearance of Unidentified Ordinances (UXO) or explosive weapons that did not explode and posed risks of detonation, were completed before the sites were handed over to contractors (ICR, paragraph 109). The project components specified technical assistance directed at building the capacity of the implementing entities that were not familiar with Bank processes (see component 3 in Section 2 Project Objective and Components above). The Mid Term



Review (MTR) was carried out in January 2015, following delayed disbursements. The MTR identified a US\$20 million deficit due to exchange rate losses (from SDR to US\$). A restructuring and additional financing (AF) covered the deficit and added a new wastewater treatment plant sub-project in Di An town. Candor in reporting the quality of performance reporting was evident in the project team's efforts to avoid leaving funds unused because the provincial implementing entities could not meet the complex process, introduced by the government, of including approved funds for ongoing sub-projects in the Mid Term Investment Plan. Nevertheless, at closing, the government requested the cancellation of US\$24.42 million (see Section 5, Efficiency above).

Overall, while taking note of the minor shortcomings that were within the Bank team's control to resolve, the quality of supervision was rated satisfactory.

### **Quality of Supervision Rating**

Satisfactory

### **Overall Bank Performance Rating**

Moderately Satisfactory

## **9. M&E Design, Implementation, & Utilization**

### **a. M&E Design**

The objectives were clearly specified. The Results Framework showed valid links along a causal chain between inputs and outputs, leading to intermediate and final outcomes that can be attributed to the project's interventions. The indicators were adequate to capture the achievement of the project outcomes. However, there was a lack of indicators to address the sustainable delivery of services, particularly for sanitation services. There were no specific indicators measuring the quality and the reliability of the water supply, but this was covered by the outcome indicator of "increase in the satisfaction rate of beneficiaries"; the customer satisfaction survey included questions related to water pressure, service continuity, and water quality, such as level of chlorine smell and turbidity (ICR, paragraph 46). There were no indicators, either, capturing the completion of project outputs of water supply systems and wastewater collection network and treatment plants in terms of kilometer or capacity, respectively. Baselines for the outcome indicators were established as defined in the Results Framework; these indicators were specific, measurable, time-bound, achievable, and relevant. The data collection arrangements were adequate; each project implementation unit would be responsible for data collection from each subproject, and the MOC would consolidate and report the data (ICR, paragraph 99). An M&E consultant was to be hired to support data verification and consolidation.

### **b. M&E Implementation**

The Administration of Technical Infrastructure (ATI), an agency of the MOC, implemented the M&E system. Each PMU contributed to the implementation of the M&E system. Planned baselines were carried out. Indicators provided in the Results Framework were measured and reported. For the water sub-projects, the number of connections installed was monitored and verified through



indicators such as volumes of water sold, revenues, and costs. For wastewater, new connections were the indicator of choice. Outcomes in drainage improvement were monitored based on areas that benefited from improved drainage and reduced flood risk. An M&E consultant regularly updated the Results Framework, but the water utilities and wastewater companies were not directly involved in the process, resulting in a missed opportunity for building capacity and institutionalizing the function (ICR, paragraph 104). Therefore, at project closing, utilities could not provide the task team consistent information on results achieved. The AF resulted in new sub-projects and new indicators were introduced (e.g., volume of BOD removed from the wastewater plant in Di An, the number of direct beneficiaries, and level of customer satisfaction, disaggregated by gender) while some were revised upwards based on additional resources (e.g., increase in the number of new piped household water connections). The method used to calculate direct beneficiaries—the indicator added at the AF—was not clearly defined (ICR, paragraph 87). Reports did not show whether beneficiaries were involved in defining target indicators and assessing achievement of indicators. The weakness in the M&E design measuring the progress in investment activities was not corrected.

### **c. M&E Utilization**

The project used the M&E results to inform the implementing entities and the Bank's task team on the project's progress and informed the requirements of the Additional Financing (AF). M&E data was used to provide evidence of achievement of outcomes, and instances of sustainability of operations. However, since the M&E function was carried out by a consultant rather than by the implementing entities, the M&E system introduced by the project may not be sustained.

The M&E system as designed and implemented was sufficient to assess the achievement of the project objectives and test the links in the result chain. However, M&E quality was rated modest because of the missed opportunity in institutionalizing the M&E function at the level of the water and wastewater utilities, inconsistent information on results achieved provided at project closing (ICR, paragraph 104), linkages among some indicators were not strengthened at the AF stage (ICR, paragraph 93), and the lack of incentives for water supply utilities to regularly update the ATI so it could monitor sector performance.

### **M&E Quality Rating**

Modest

## **10. Other Issues**

### **a. Safeguards**

**Environmental and Social Safeguards:** The project was determined to require a partial assessment (environmental category B). The project triggered OP/BP 4.01 Environmental Assessment, OP/BP 4.12 Involuntary Resettlement, and OP/BP 4.37 Safety of Dams. At AF, two additional safeguards were triggered - OP/BP 4.11 Physical Cultural Resources and OP/BP 7.50 Projects on International Waterways. The latter was triggered because treated water from the Di An WWTP was to be discharged to a local canal that flowed into the Dong Nai River of which Cambodia was a riparian state.



An Environmental Management Plan was prepared for each sub-project identified at appraisal and disclosed on December 6, 2010. Overall, there were no major environmental, health or safety issues. The World Bank team and the Project Management Unit (PMU) closely monitored the implementation of UXO clearance prior to turning cleared sites over to contractors. An independent consultant supervised the implementation of environmental safeguards on behalf of the MOC and its performance has been reported as acceptable (ICR, paragraph 109). The project did not finance construction of dams but triggered this safeguard because raw water would be supplied by reservoirs that have formed an existing dam. At the 2015 MTR, an independent consultant carried out dam safety review and concluded that all dams were operational and safe with remedial actions for (i) Duong Dong Dam for seepage treatment; (ii) Phu Ninh dam for gate repair; and (iii) Dong Xoai dam for installation of monitoring instruments. According to the ICR (paragraph 110), all remedial actions were completed. World Bank management granted an exception to the riparian notification allowed under paragraph 7(c) of OP/BP 7.50 since Vietnam was the lowest downstream riparian of the Dong Nai River, hence this river ran only in Vietnam and did not cause harm to other riparian states.

OP/BP 4.11 Physical Cultural Resources was triggered because the project activities financed under AF would result in considerable amounts of earthworks. Public consultations were carried out. A Resettlement Policy Framework and 15 Resettlement Action Plans were prepared and disclosed. Documentation of land acquisition was not adequately prepared by some sub-projects. The World Bank team provided intensified guidance and shared templates to record land acquisition. Land acquisition encountered some delays due to lengthy processes, weak project management capacity, timing constraints resulting from required approvals of lands appraised, and differences between resettlement policies of the government and the World Bank. Compensation levels and assistance to project affected households were completed and issues resolved by project closing except in Thai Hoa and Ninh Binh sub-projects. There were no outstanding unresolved grievances reported at project closing.

## **b. Fiduciary Compliance**

**Financial Management:** The Ministry of Construction (MOC) and the implementing agencies complied with World Bank financial management policies and procedures. All unaudited interim financial reports were submitted on time and met World Bank requirements. The MOC submitted Independently audited financial reports on time, with the final one expected on June 30, 2020. Privately operated water supply utilities submitted annual audited financial statements according to Vietnamese Accounting Standards. The audits were unqualified (ICR, paragraph 116).

**Procurement:** All project procurement activities complied with the World Bank's guidelines. Contract management in some sub-projects were observed to be weak, leading to implementation delays and quality concerns. These were addressed to the satisfaction of the World Bank. There was one complaint related to a local company. That bidder was sanctioned in accordance with national procurement laws and regulations, satisfactory to the World Bank requirements.

## **c. Unintended impacts (Positive or Negative)**



None

d. Other

None

## 11. Ratings

Ratings	ICR	IEG	Reason for Disagreements/Comment
Outcome	Satisfactory	Satisfactory	
Bank Performance	Satisfactory	Moderately Satisfactory	There were moderate shortcomings in Quality at Entry such as absence information and education campaign activities to raise awareness about the benefits of connection to the wastewater collection system, and insufficient risk analysis.
Quality of M&E	Modest	Modest	
Quality of ICR	---	Substantial	

## 12. Lessons

- **Inexperienced implementing entities may require periodic, customized, technical assistance to build their capacity to achieve project objectives.** In this project, constructing wastewater systems was delayed because of the introduction of new processes for which the implementation entities were not prepared, such as the preparation of sanitation strategy plans before implementing the environment sanitation sub-projects. In addition to the capacity building components of the project itself, additional technical assistance efforts were included in consulting packages to address capacity gaps of implementing agencies, particularly those unfamiliar with World Bank processes.
- **Information and educational campaigns may influence behavioral change in households to address their reluctance to connect to wastewater systems.** In this project, the outcome indicator called for increasing the number of households connected to the wastewater system. Households who used septic tanks or public drains and who did not appear to be negatively affected by wastewater discharge were disinclined to connect to the system without the incentives that other households received. The project financed household connections to the wastewater systems and technical engineering solutions but did not devise educational campaigns or behavior change strategies to increase the level of household connections.



- **Engaging beneficiaries may improve the data productivity and utilization of a project's M&E system.** In this project, the quality of beneficiary information under the M&E system was inadequate. The implementing agencies could not monitor performance of the utilities and outcome of the project interventions using beneficiary information. Data disaggregated by relevant factors, could not be collected. Engaging beneficiaries through periodic customer surveys could strengthen the usefulness of an M&E system, refine beneficiary selection for outcome attribution, facilitate decision making, and bring transparency in sector service delivery.

### 13. Assessment Recommended?

No

### 14. Comments on Quality of ICR

The ICR provided a comprehensive overview of the project. The narrative was internally consistent and highly evaluative. The ICR was adequately focused on the results of the project; it provided sufficient evidence to support the outcome of the project's intervention, including the factors behind not meeting wastewater household connections. The interrogation of evidence was adequate, and the analysis clearly linked evidence to findings. The lessons were informed by the operation, particularly with regard to the benefit of adopting information and educational campaigns to boost household connections for wastewater services. The annexes provided additional information to expound on the cost effectiveness of the project (see Annex 4 Efficiency Analysis). Boxes in the main text and footnotes were helpful in understanding technical concepts. The ICR was also consistent with the Bank guidance.

In the section on Quality at Entry, paragraph 119 of the ICR stated that the number of household sanitation connections could have been used as an intermediate indicator. Lastly, the ICR was substantially longer (39 pages) than recommended in the Bank guidance (15 or 20 pages).

#### a. Quality of ICR Rating

Substantial



