April 12, 2016

Closing Date: Friday, April 29, 2016 at 6 p.m.

FROM: Vice President and Corporate Secretary

Vietnam - Vinh Phuc Flood Risk and Water Management Project

Project Appraisal Document

Attached is the Program Appraisal Document regarding a proposed loan to Vietnam for a Vinh Phuc Flood Risk and Water Management Project (R2016-0070), which is being processed on an absence-of-objection basis.

Distribution:

Executive Directors and Alternates
President
Bank Group Senior Management
Vice Presidents, Bank, IFC and MIGA
Directors and Department Heads, Bank, IFC and MIGA

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The World Bank

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Report No: PAD1657

INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT

PROJECT APPRAISAL DOCUMENT

ON A

PROPOSED LOAN

IN THE AMOUNT OF US$150 MILLION

TO THE

SOCIALIST REPUBLIC OF VIETNAM

FOR A

VINH PHUC FLOOD RISK AND WATER MANAGEMENT PROJECT

April 8, 2016

Water Global Practice
East Asia and Pacific Region

CURRENCY EQUIVALENTS
(Exchange Rate Effective February 29, 2016)

Currency Unit = VND
VND 22,300 = US$1

FISCAL YEAR
January 1 – December 31

ABBREVIATIONS AND ACRONYMS

AAD	Annual Average Damage
BOD	Biochemical Oxygen Demand
DA	Designated Account
DARD	Department of Agriculture and Rural Development
DED	Detailed Engineering Design
DOC	Department of Construction
DOF	Department of Finance
DONRE	Department of Natural Resources and Environment
DOT	Department of Transportation
DP	Development Partner
DPC	District People's Committee
DPI	Department of Planning and Investment
EM	Ethnic Minority
EMDP	Ethnic Minorities Development Plan
EMPF	Ethnic Minority Policy Framework
ESIA	Environmental and Social Impact Assessment
FDI	Foreign Direct Investment
FM	Financial Management
FS	Feasibility Study
GA	Gender Analysis
GDP	Gross Domestic Product
GRS	Grievance Redress Service
IA	Implementing Agency
ICB	International Competitive Bidding
IDA	International Development Association
IFR	Interim Financial Report
IRR	Internal Rate of Return
JICA	Japan International Cooperation Agency
LA	Loan Agreement
M&E	Monitoring and Evaluation
MARD	Ministry of Agriculture and Rural Development
MoF	Ministry of Finance
NCB	National Competitive Bidding
NPV	Net Present Value
O&M	Operation and Maintenance
ODA	Official Development Assistance

PAD	Project Appraisal Document
PC	People's Committee
PCRA	Procurement Capacity And Risk Assessment
PDO	Project Development Objective
PMO	Project Management Office
PMU	Project Management Unit
POM	Project Operations Manual
PPC	Provincial People's Committee
PPSD	Project Procurement Strategy for Development
P-RAMS	Procurement Risk Management Assessment System
PSC	Project Steering Committee
QCBS	Quality- and Cost-Based Selection
RAP	Resettlement Action Plan
RPF	Resettlement Policy Framework
SA	Social Assessment
SCADA	Supervisory Control and Data Acquisition
SEDP	Socioeconomic Development Plan
URENCO	Urban and Environment Management Company
VYWSC	Vinh Yen Water Supply Company
WWTP	Wastewater Treatment Plant

Regional Vice President:	Xiaoqing Yu (Acting)
Country Director:	Victoria Kwakwa
Senior Global Practice Director:	Jennifer J. Sara (Acting)
Practice Manager:	Ousmane Dione
Task Team Leaders:	Lixin Gu and Vinh Quang Nguyen

SOCIALIST REPUBLIC OF VIETNAM
VINH PHUC FLOOD RISK AND WATER MANAGEMENT PROJECT
TABLE OF CONTENTS

Page

PAD DATA SHEET

Vietnam

Vinh Phuc Flood Risk and Water Management Project (P152460)

PROJECT APPRAISAL DOCUMENT

EAST ASIA AND PACIFIC

Water Global Practice

Report No.: PAD1657

Basic Information			
Project ID P152460	EA Category A - Full Assessment		Team Leader(s) Lixin Gu, Vinh Quang Nguyen
Lending Instrument Investment Project Financing	Fragile and/or Capacity Constraints [ ] Financial Intermediaries [ ] Series of Projects [ ]		
Project Implementation Start Date 29-April-2016	Project Implementation End Date 30-Jun-2021		
Expected Effectiveness Date 29-July-2016	Expected Closing Date 31-Dec-2021		
Joint IFC No			
Practice Manager/Manager Ousmane Dione	Senior Global Practice Director (Acting) Jennifer Sara	Country Director Victoria Kwakwa	Regional Vice President (Acting) Xiaoqing Yu

Borrower: SOCIALIST REPUBLIC OF VIETNAM			
Responsible Agency: Vinh Phuc Provincial Department of Planning and Investment			
Contact:	Mr. Nguyen Duc Tai	Title:	Deputy Director
Telephone No.:	842113842743	Email:	banqlodavp@gmail.com

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

Total Project Cost:	220.00	Total Bank Financing:	150.00

Financing Gap:	0.00

Financing Source	**Amount**
Borrower	70.00
International Bank for Reconstruction and Development	150.00
Total	220.00

Expected Disbursements (US$, millions)

Fiscal Year	2016	2017	2018	2019	2020	2021	2022	0000	0000	0000
Annual	0.00	6.00	22.00	32.00	32.00	38.00	20.00	0.00	0.00	0.00
Cumulative	0.00	6.00	28.00	60.00	92.00	130.00	150.00	0.00	0.00	0.00

Institutional Data

Practice Area (Lead)

Water

Contributing Practice Areas

Cross Cutting Topics

[X] Climate Change

[ ] Fragile, Conflict & Violence

[X] Gender

[X] Jobs

[ ] Public Private Partnership

Sectors / Climate Change

Sector (Maximum 5 and total % must equal 100)

Major Sector	Sector	%	Adaptation Co-benefits %	Mitigation Co-benefits %
Water, sanitation and flood protection	Flood protection	60	100	0
Water, sanitation and flood protection	General water, sanitation and flood protection sector	40	100	0
Total		100		

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

Themes

Theme (Maximum 5 and total % must equal 100)

Major theme	Theme	%
Environment and natural resources management	Water resource management	40
Social protection and risk management	Natural disaster management	25
Environment and natural resources management	Climate change	25
Urban development	City-wide Infrastructure and Service Delivery	10
Total		100

Proposed Development Objective(s)

The project development objective (PDO) is to strengthen flood risk management capacity and improve wastewater management in the central catchment of Vinh Phuc Province.

Components

Component Name	**Cost (US$, millions)**
Component 1 - Flood Risk Management	173.80
Component 2 - Water Environment Management	20.30
Component 3 - Implementation Support, Technical Assistance, and Institutional Strengthening	16.40

Systematic Operations Risk-Rating Tool (SORT)

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

Compliance

Policy

Does the project depart from the CAS in content or in other significant respects?	Yes [ ] No [x]

Does the project require any waivers of Bank policies?	Yes [ ]	No [x]
Have these been approved by Bank management?	Yes [ ]	No [ ]
Is approval for any policy waiver sought from the Board?	Yes [ ]	No [x]
Does the project meet the Regional criteria for readiness for implementation?	Yes [x]	No [ ]

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

Legal Covenants

Name	**Recurrent**	**Due Date**	**Frequency**

Non Standard Conditions

Source Of Fund	**Name**	**Type**
IBRD	Article IV, 4.01 of Loan Agreement	Effectiveness

Description of Condition

The Subsidiary Loan Agreement has been executed by the Borrower, acting through its Ministry of Finance, and Vinh Phuc PPC.

Team Composition

Bank Staff

Name	**Role**	**Title**	**Specialization**	**Unit**
Lixin Gu	Team Leader (ADM Responsible)	Senior Infrastructure Specialist	Infrastructure Specialist	GWADR
Vinh Quang Nguyen	Team Leader	Senior Water & Sanitation Spec.	Water & Sanitation Specialist	GWASE
Anjali Acharya	Team Member	Senior Environmental	Environmental Specialist	GENDR

		Specialist		
Demilour Reyes Ignacio	Team Member	Program Assistant	Program Assistant	GWADR
Hoang Xuan Nguyen	Procurement Specialist (ADM responsible)	Senior Procurement Specialist	Procurement Specialist	GGODR
Linh Hoang Vu	Team Member	Economist	Economist	GPVDR
Mai Thi Phuong Tran	Financial Management Specialist	Senior Financial Management Specialist	Financial Management Specialist	GGODR
Chau-Ching Shen	Disbursement	Senior Finance Officer	Finance Officer	WFALN
Evarist Baimu	Legal	Senior Counsel		LEGES
Thu Ha Le	Legal	Associate Counsel		LEGES
Noreen Beg	Safeguards Specialist	Senior Environmental Specialist	Environmental Specialist	GENDR
Regassa Namara	Economist	Senior Water Resources Economist	Water Resources Economist	GWADR
Rumana Abubeker	Team Member	Consultant	Monitoring & Evaluation	GWADR
Joop Stoutjesdijk	Team Member	Lead Irrigation Engineer	Irrigation Engineer	GWADR
Jong Ho Ahn	Team Member	Senior Water Resource specialist	Water Resource specialist	GWA02
Roxanne Hakim	Safeguards Specialist	Senior Social Development Specialist	Social Development Specialist	GSURR
Shunong Hu	Team Member	Senior Water Engineer	Water Engineer	GWADR
Silvia Del Pilar Larreamendy Ricardo	Safeguards Specialist	Consultant	Social Safeguards Specialist	GWADR
Son Duy Nguyen	Team Member	Senior Operations Officer	Operations Officer	EACVF
Thuy Cam Duong	Team Member	Environmental Specialist	Environmental Specialist	GENDR
Tuan Anh Le	Team Member	Social Development Specialist	Social Development Specialist	GSURR
Farah Imrana	Team member	Senior Financial	Financial Specialist	FABBK

Hussain		Specialist		
Tuyet Thi Phung	Team Member	Program Assistant	Program Assistant	EACVF

Extended Team

Name	Title	Office Phone	Location

Locations

Country	First Administrative Division	Location	Planned	Actual	Comments
Vietnam	Vĩnh Phúc	Vĩnh Phúc	**X**		Vinh Phuc Province

I. STRATEGIC CONTEXT

A. Country Context

1. **Vietnam has recorded remarkable economic growth and poverty reduction in the last two decades**, with the gross domestic product (GDP) growth for the period 2005-2015 averaging 6 percent per year. This growth has been accompanied by pronounced structural changes at the aggregate (macro) level. The changes in the structure of the economy are largely mirrored in the composition of the country's employment. Two decades ago, agriculture was the primary source of employment among three-quarters of the population while only 10 and 15 percent, respectively, were concentrated in industry and services. Today, the share of the labor force working in agriculture has fallen below 50 percent, while the share in both industry and services has doubled.

2. **Poverty reduction in Vietnam has been impressive.** Using a 'basic needs' poverty line initially agreed to in the early 1990s, the poverty headcount fell from 58 percent in the early 1990s to below 6 percent by 2014. Using the poverty line as defined in 2010, the overall poverty rate dropped from 20.7 percent to 13.5 percent between 2010 and 2014. The drop was most pronounced in rural areas from 26 percent to 18.6 percent. Poverty also dropped in urban areas, from 6.0 percent to 3.8 percent. Similar progress with steadily rising incomes is evident when assessed by 'international' poverty thresholds of US$1.25 and US$2.00 person per day (2005 Purchasing Power Parity). Progress has also been substantial in other dimensions of the human development index, ranging from high primary and secondary enrollment to improvements in health status and reduced morbidity and mortality. Vietnam achieved, and in some cases surpassed, many of the Millennium Development Goals.

3. **Long-term growth in Vietnam has been fairly equitable.** Inequality measured using the Gini coefficient rose modestly from the early 1990s through 2004 and then stabilized before dropping slightly in the most recent data. In 2012, Vietnam's income Gini coefficient was 39.4, placing it at the middle of the global Gini distribution. The World Bank has used the growth rate of the mean income of the bottom 40 percent as a measure of shared prosperity. By this metric, Vietnam has done extremely well. Between 1993 and 2012, income of the bottom 40 percent grew at an annual rate of 8.9 percent, exceeding the 7 percent growth rate of the top 60 percent of the population.

B. Sectoral and Institutional Context

Profile of Vinh Phuc Province

4. **Vinh Phuc Province, located adjacent to the capital of Vietnam, Hanoi, is home to 1.04 million people, with 77 percent residing in rural areas.** Agriculture constitutes the primary sector (7 percent) engaging more than half of the provincial population, while industry, spurred mainly by Foreign Direct Investment (FDI) is attracting migrant workers from poorer provinces, mostly the northern mountains and the Red River Delta. Growing urbanization (and related services) is the third major economic driver in the province. Vinh Phuc has become an important economic engines and growth hub for northern Vietnam. In 2014, the GDP per capita in the province was VND 61 million, higher than the national level of VND 43 million. Vinh

Phuc is one of 12 provinces, which at present makes net contributions to the central budget. During the course of Vietnam's economic transition, Vinh Phuc has generated tens of thousands of jobs. In the period of 2012–2015 alone, about 90,000 jobs were created and the province is playing a major role in reducing poverty through job creation.

5. **At the aggregate level, all economic indicators in the province are impressive but the figures mask important socioeconomic differences**. About 82.1 percent of the households in the province earn VND 5 million per month or less (equivalent to US$230). While the official provincial level statistics reported a per capita average of VND 52 million per year (equivalent to US$2,330) for Vinh Phuc Province, the socioeconomic survey conducted in the project area as part of the Environmental and Social Impact Assessment (ESIA) revealed a much lower provincial average of VND 13.7 million per year (equivalent to US$610). The income distribution among the sample households from the project area is as follows: (a) 3.3 percent of the sample households obtain less than VND 1 million per month and are considered poor and vulnerable; (b) 42.9 percent of the sample households earn between VND 1 million (equivalent to US$45) and 3 million a month (equivalent to US$135); (c) 35.9 percent receive between VND 3 million (equivalent to US$135) and 5 million a month (equivalent to US$224); and (d) 17.9 percent obtain more than VND 5 million a month (equivalent to US$224). Therefore, assuming an average household size of four and considering the revised poverty line of US$1.9 per capita per day, a substantial proportion of the sample households from the project area are considered to be poor. Despite the favorable economic indicators at the provincial level, a significant segment of the population, particularly in the rural communities, is facing economic challenges, further compounded by high exposure to flood hazards and general environmental pollution.

Vinh Phuc's Exposure to Flood Hazards

6. **Vinh Phuc is a landlocked province located in the upper reaches of the Red River Delta**. The provincial city, Vinh Yen, is about 60 km from Hanoi. Vinh Phuc is positioned in three main development regions of Vietnam: the Red River Delta Region, Hanoi Metropolitan Region, and Northern Key Economic Region. Vinh Phuc is hydraulically divided into three drainage basins: (a) Northwest Basin (Basin A); (b) Central and South Basin (Basin B); and (c) Northeast and East Basin (Basin C). These subbasins are illustrated on the map in annex 2. Basin B is the central part of the province where most of the economic and administrative activities are located. Basin B drains to the Phan River and from there to the Ca Lo River. The confluence of the Phan River with the Ca Lo River is in Nam Vien Commune, Phuc Yen Town.

7. **Two-thirds of the province is prone to frequent flooding while at the same time experiencing water shortages during the dry season because of Vinh Phuc's low elevation in the Red River floodplain.** There is an especially high risk of flooding in the areas of the Phan River Basin (Basin B) where the provincial capital city of Vinh Yen and most of the FDI zones are located. Damages caused by floods during 2006–2013 amounted to US$150 million, including the loss of agricultural production (about 30 percent of the harvest over the years), damages to infrastructure in both rural and urban areas, and disruption to businesses and production, as well as health-related costs. In addition to flooding during the rainy season (May to October), Vinh Phuc faces water shortages for agricultural activities during the dry season from November to April. To compensate for the water shortage and to meet water demand, water needs to be abstracted from the Red River and the Ca Lo River. With impacts of climate change

and development of hydropower stations upstream of these rivers, it is becoming more and more costly to obtain water from the two main rivers.

8. **Accelerated deterioration of water quality has been observed in the Phan River Catchment**, including rivers and lakes around Vinh Yen City. The main water pollution sources are domestic and industrial wastewater because of high-density rural population and numerous industrial zones. While all the wastewater from industrial zones and part of Vinh Yen City is treated before discharge, wastewater generated from the towns, villages, and small industrial clusters along the Phan River is discharged directly into the river without treatment. Surface water quality no longer meets the required Category A standard and, in the dry season, is well below Category B. Concentration of biochemical oxygen demand (BOD) and chemical oxygen demand exceed limits regulated by the government's national code for surface water (category B per QCVN 08-2008/BTNMT). Analysis conducted by the Department of Natural Resources and Environment (DONRE) of Vinh Phuc Province shows that domestic wastewater is the main pollution source. According to 2013 monitoring data, concentration of BOD varied from 29 mg per liter to 136 mg per liter, which is 1.16 to 5.44 times greater than the allowed limit. Similarly, concentration of chemical oxygen demand varied from 98.7 mg per liter to 345 mg per liter; 2.82 to 9.86 times the allowed limit. Water pollution has caused significant impacts on public health and is also affecting Vinh Phuc's ambition to become one of the main industrial, service, and tourism centers in the Metropolitan Hanoi Area, as laid out in the province's Strategic Urban Master Plan 2030.

9. **Lack of a coordinated mechanism to respond to flood and environmental pollution leaves the provincial population vulnerable.** The Provincial People's Committee (PPC) is the decision-making authority at the provincial level and is supported by the line departments. Responsibilities for managing the water sector are shared across departments. The Vinh Phuc Department of Agriculture and Rural Development (DARD) is responsible for flooding and irrigation; the Vinh Phuc Department of Natural Resources and Environment (DONRE) for water resource and water quality management; and the Vinh Phuc Department of Construction (DOC) for urban water supply, wastewater, and drainage. The designated district and city governments also have duties within their territory. In addition, water-related sector practitioners, such as the irrigation company, water supply and wastewater companies, and environmental monitoring institutions have specific roles in water management. The few existing flood risk management infrastructures date back to the French colonial time and no longer function. In addition, there is no mechanism for coordination and communication to respond comprehensively to water sector challenges.

10. **The Government and development partners (DPs) have been working with Vinh Phuc to address challenges related to water resources but on a small scale and in a scattered manner.** With the support of the central government and the DPs, the Vinh Phuc PPC has invested in water-related works in the project area, including dredging (in small scale) the Phan River and Dam Vac Lake in Vinh Yen City, building a small pumping station to pump out water from fields to the Phan River and piloting water pollution control in some villages surrounding the Phan River. However, the works are scattered and do not comprehensively address the issues of flooding and water pollution in the province. Japan International Cooperation Agency (JICA) and the Asian Development Bank are actively engaged in the Vinh

Yen City area, building a wastewater treatment plant (WWTP) and sewers, as well as limited small-scale support to household connections and lake rehabilitation to address water pollution.

11. **Both the central government and Vinh Phuc Province are strongly committed to flood risk and water management,** as reflected in the government's National Strategy for Prevention and Mitigation of Natural Disasters to 2020.[1] The main objectives of the strategy include (a) enhancing early warning systems for floods, storms, droughts, sea water intrusion, earthquakes, and tsunamis; (b) ensuring that development plans and building codes for buildings and residential areas are consistent with the regional standards of flood protection; (c) training for staff on disaster risk management at all levels to develop the capacity to prevent, respond to, and mitigate natural disasters; and (d) ensuring safety for the dike and embankment systems to improve resilience against storms for all the northern provinces. The proposed project fits these national objectives and is aligned with the strategies and priorities identified by the Government in its Urban Master Plan, with vision to 2050 as well as Vinh Phuc's provincial Socioeconomic Development Plan (SEDP) and 2030 Urban Master Plan as detailed in paragraph 14.

C. Higher Level Objectives to which the Project Contributes

12. **The proposed project is consistent with the World Bank Group's Country Partnership Strategy for Vietnam 2012–2016 (Report 85986-VN) and contributes directly to the 'Sustainability' and 'Opportunity' pillars.** Furthermore, the proposed project will address the critical constraint for Vinh Phuc's long-term development by increasing the ability of Vinh Phuc Province and its people, economic assets, and commercial businesses to withstand the impacts of natural hazards and climate change. The project specifically supports three Country Partnership Strategy outcomes: (a) enhanced preparedness for natural hazards and climate change; (b) increased opportunities for the poor and households resilience to shocks; and (c) improved basic infrastructure and public service delivery and access.

13. **The project contributes to the World Bank Group's twin goals of reducing poverty and boosting shared prosperity.** The project will reduce vulnerability to flooding and secure agricultural yields directly benefitting 810,000 people living in the sub-catchment area, in particular the 46 percent of the population living below the poverty line in the project area. The project will also help improve environmental conditions in small towns and rural villages through improved wastewater services, resulting in reduced incidences of waterborne diseases and associated health care costs for impoverished households, about half of which are female inhabitants residing in the project area.

14. **The project is fully aligned with Vinh Phuc's 2020 Provincial SEDP[2] and 2030 Urban Master Plan.**[3]The SEDP laid out the vision for Vinh Phuc to become an industrial,

[1] "National Strategy for Prevention and Mitigation of Natural Disasters to 2020" has been approved by the Government under Decision No 172/2007 / QD-TTg dated 16 November 2007. The overall objective is "to mobilize all resources for effective implementation of prevention and mitigation of natural disasters, from now to 2020 to minimize the damages to people and property, limiting disruption of natural resources, environment and cultural heritage, contributing significantly to ensure the sustainable development of the country and ensuring national defense and security."

[2] Vinh Phuc 2020 Provincial SEDP approved by the prime minister of Vietnam by his Decision No. 113/QD-TTg dated January 20, 2012.

service, and tourism center of the country by 2020 while the Urban Master Plan targeted the project areas to be developed as a high-quality agricultural supply base to the city of Hanoi. Reducing the flood risk and improving related water infrastructures in the province would greatly enhance Vinh Phuc's investment environment and increase its competitiveness in the region by attracting new businesses that will boost the creation of jobs. The province already attracts thousands of migrant workers from the northern provinces because of its ideal location and the job opportunities generated by burgeoning international businesses. Improvements in infrastructure in the province would serve as a guarantee and boost investors' confidence by attracting more FDI and better jobs to further unleash Vinh Phuc's economic potential.

II. PROJECT DEVELOPMENT OBJECTIVES

A. PDO

15. The project development objective (PDO) is to strengthen flood risk management capacity and improve wastewater management in the central catchment of Vinh Phuc Province.

B. Project Level Result Indicators

16. The progress in achieving the PDO will be monitored by the following PDO level indicators

(a) Direct project beneficiaries (number): of whom female (percentage)

(b) Surface area protected from a 10-year return period flood event (percentage)

(c) People benefited from flood risk control (number)

(d) People provided with access to improved sanitation facilities under the project (Number)

(e) Protocol for integrated water resource management approved by the PPC (yes/no)

C. Project Beneficiaries

17. **The project directly benefits inhabitants in flood-prone areas along the Phan River Basin Catchment.** The project will protect Basin B and C areas, in particular the lowest elevation part of approximately 8,390 ha. The population of the province in direct proximity of the proposed works and measures is estimated to be about 810,000, of which 60 percent of the inhabitants are in rural areas and 40 percent in urban areas and small towns. With the project interventions, about 5,720 ha out of the frequently flooded 8,390 ha will be protected from floods of 10-year return period. With that reduced flooding, about 255,000 people in the project areas will benefit directly. This is the population that is reported to be either historically subject to significant flood damages and losses or at high risk based on hydraulic modeling. Among the total beneficiaries, 51 percent are expected to be female.

[3] Vinh Phuc 2030 Urban Master Plan, with vision to 2050 approved by the prime minister of Vietnam by his Decision No. 1883/QD-TTg dated October 26, 2011.

18. **The direct beneficiaries from improved access to wastewater and drainage services** will be inhabitants in four towns and 33 rural villages. About 121,000 people will directly benefit from the project intervention and more than half of the beneficiaries are expected to be among the bottom 40 percent. Furthermore, the reduction in pollution loads will result in better water quality and improve the overall environment in the Phan River Catchment. The inhabitants in neighboring provinces downstream who use the Phan-Ca Lo River for drinking water will benefit from the improved water quality of the river.

19. **The project will establish a mechanism for integrated water resource management through supporting flood information, early warning, and water resource monitoring systems,** which will strengthen the institutional capacity for informed decision making. The project expects to enhance the operation and maintenance (O&M) capacity of water practitioners, improve coordination among them, and pave the way for more integrated water management in the river basin.

III. PROJECT DESCRIPTION

20. **The project concept and design is guided by a careful assessment of the topography and related water issues in the province.** Given that the Phan River flows across the province, problems of flooding and water quality in the catchment are interlinked. The current piecemeal approach with stand-alone interventions by various departments to tackle these issues are proving inefficient and costly. Hence, the project design carefully assembled the components to address the issues holistically, by adopting an integrated basin-wide river management approach. The design concept has strong buy-in and endorsement of the provincial government and is among the main strategic priorities of the central government. The design followed a thorough analysis and quality review to achieve the sought development objectives.

21. **Given the interlinkages between flooding and water pollution, the proposed project addresses these issues in an integrated manner through an optimal mix of structural and nonstructural measures**. These include (a) supporting structural measures for flooding control and river rehabilitation; (b) improving wastewater collection and treatment in district small towns and rural villages; (c) establishing water resource, flooding information and early warning systems; and (d) institutional development and training for government departments and water sector practitioners aimed at managing the river basin and water-related sectors in an integrated manner.

A. Project Components

Component 1 - Flood Risk Management (estimated cost US$173.8 million)

22. This component improves flood risk management through structural measures in Basin B (including subbasins B-1, B-2, and B-3) and Basin C. The measures include (a) construction and rehabilitation of three retention lakes with a total area of 260 ha to increase regulation capacity; (b) construction of three drainage pumping stations with total capacity of 145 m^3 per second and related canals to divert excessive storm water from Basin B to the Pho Day and Red River; (c) dredging key sections along 31.62 km of the Phan River to increase the discharge capacity; and

(d) construction of two flood control gates with associated embankments to prevent storm water from Basin C from entering Basin B.

Component 2 - Water Environment Management (estimated cost US$20.3 million)

23. The long-term objective of this component is to improve the environmental conditions in densely populated small towns and rural communities, as well as the water quality in the Phan River by providing wastewater and drainage services. The measures include the construction and rehabilitation of wastewater collection and treatment facilities in four district towns and 33 rural villages along the Phan River. Given the source of pollution is primarily from domestic households, this component will focus on intercepting and treating wastewater. Simple and low-cost technologies that will not require sophisticated mechanical equipment, high power consumption and complicated O&M will be applied.

Component 3 - Implementation Support, Technical Assistance and Institutional Strengthening (estimated cost US$16.4 million)

24. This component supports (a) project implementation, including detailed engineering designs (DEDs), construction supervision, safeguard monitoring, Project Management Office (PMO) support, and other related activities; (b) water resource, flood information, and early warning systems, including consulting services, works, equipment and other related activities; (c) O&M for assets to be built under the project, including training, development of operation manuals, and provision of necessary equipment; and (d) institutional development for river basin management and water-related sectors in an integrated manner.

B. Project Financing

25. The estimated total project cost is US$220 million, with US$150 million proposed to be financed by an IBRD loan. The estimated government counterpart funding is US$70 million, to cover the costs of resettlement, a portion of construction, and overhead costs.

	Category	Total Project Costs, Expressed in US$	Amount of the Loan Allocated (Expressed in US$)	Percentage of Expenditures to be Financed (inclusive of Taxes)	Government Financing, in US$	Percentage of Government Financing, %
1.	**Works:**					
	Component 1 - Flood Risk Management	90,360,000.00	76,720,000.00	85	13,640,000.00	15
	Component 2 - Water Environment Management	17,210,000.00	14,604,000.00		2,606,000.00	
2.	**Goods:**					
	Component 1 - Flood Risk Management	32,710,000.00	32,710,000.00	100	–	0
	Component 2 - Water Environment Management	122,000.00	122,000.00		–	
3.	**Consulting and Non-Consulting Services, Trainings, and Workshops:**					

	Component 3 - Implementation Support, Technical Assistance, and Institutional Strengthening	16,389,000.00	16,389,000.00	100	–	0
4.	**Land Compensation and Resettlement:**	42,350,000.00	-	0	42,350,000.00	100
5.	**Project Overheads:**	11,404,000.00	–	0	11,404,000.00	100
6.	**Front-end Fee:**	375,000.00	375,000.00	100	–	0
7.	**Commitment Fee**	1,200,000.00	1,200,000.00	100	–	
8.	**Interests During Construction**	7,880,000.00	7,880,000.00	100	–	0
Total Amount:		**220,000,000.00**	**150,000,000.00**	**68**	**70,000,000.00**	**32**

C. Lessons Learned and Reflected in the Project Design

26. **This is the first IBRD project in a river basin within a single province in Vietnam covering flood risk management, water pollution improvement, and other capacity-related activities**. The Bank has a large water-related portfolio in Vietnam but mainly in the water supply, wastewater, and drainage sectors with several provinces and cities involved in a project. There is limited experience in integrated river basin management in Vietnam, the Bank's global experiences and lessons were therefore drawn upon in the project design. Key lessons drawn from Brazil, China, and India flood and river basin management projects suggest that successful river basin management calls for a holistic, integrated approach toward water resource management, given the complex and multisectoral nature of flood risk management. Most global lessons also underscore the paramount importance of engaging stakeholders at various levels and building their core institutional capacity for successful and sustainable river basin management. These lessons have been taken into consideration, including strong government commitment and ownership, active involvement of all the water-related government departments, utilities and local governments, advanced consultation and planning, and so on. These arrangements will help mitigate the implementation bottlenecks such as inadequate project ownership and management capacity and lack of leadership and collaboration among the various government departments and institutions.

27. **Careful institutional analysis and design of technical assistance for institutional development were one of the main priorities during the design of the project**. As a country with a strong government role cascading down from central to local levels, the vertical administrative arrangements in Vietnam function well in the line ministries and their respective counterparts in local governments. However, horizontal communication and coordination among various government entities is weak. This is also the case in Vinh Phuc Province where workflow and decision making within one department and its affiliates are relatively efficient. However, tasks that necessitate collaboration between multiple departments and across institutions, such as water issues in a river basin, are often difficult. Effective river basin management calls for top-down, bottom-up, and vertical and horizontal integration and the project design seeks to reinforce this aspect through targeted capacity building and technical assistance.

28. **The project draws lessons and experiences from Bank projects in other countries**. The option of creating a water management board or committee under the PPC and above the provincial departments was considered as a means to enhance the institutional cooperation and

efficiency. However, under the reform agenda of the Government, which includes reduction in public payroll, this option is not attainable within the project span of four to five years and the Government is reluctant to consider this arrangement. This has also been the case in other countries such as China, where a Bank study in the water sector proposed to establish a water board or committee under the State Council. This proposal did not receive the government's buy-in. Also, based on Bank experience, institutional strengthening can only be achieved in a gradual manner through long-term commitment rather than a single intervention. This is, for example, evident from the experience in Brazil where the importance of treating institutional objectives as long-term programmatic engagement rather than at the project level is emphasized. Therefore, the project was designed using a phased approach. Based on these lessons, the project design capitalizes on strengthening existing systems rather than creating an additional layer by involving water-related entities and project stakeholders in project design, preparation, implementation, and future O&M. This arrangement ensures project ownership, commitment, and sustainability.

29. **The experience gained in this project has strong potential for replication in other provinces in the country**. Considering the global lessons and experience embedded in the project design, the wide stakeholder consultation and involvement carried out, and the strong ownership demonstrated, the project will not only add value for Vinh Phuc for attracting investors and driving competitiveness in the province but will also serve as a pilot for replication in other provinces and river basins. There are over 60 provinces with similar size and population and some with similar geographic situation.

IV. IMPLEMENTATION

A. Institutional and Implementation Arrangements

30. The project is multisectoral, cutting across flood risk management, water resource management, agriculture development, environmental pollution management, and infrastructure development. Both the planning and implementation of investments will, therefore, require working across departmental boundaries and close coordination at the various levels. The institutional and implementation arrangement are built on existing mechanisms that include lessons learned from other Bank-financed projects in Vietnam, as well as international best practice. These arrangements will ensure effective implementation and quality assurance of the project, as detailed in the structures, roles, and responsibilities in the subsequent paragraphs.

31. The project will be implemented by the Vinh Phuc Official Development Assistance (ODA) PMO, under the direction of the Vinh Phuc PPC. For expediting project implementation, Vinh Phuc has established a Project Steering Committee (PSC), chaired by a chair/ vice chairman of the PPC and with leaders of key provincial departments, concerned provincial agencies, and participating cities and districts as members. The PMO plays the role of project owner and is responsible for overall project administration, implementation, and management, including procurement, financial, and safeguards management; project monitoring; reviewing and approving designs; cost estimations; bidding documents; and so on. The PMO will also be responsible for payment processing and handing over the completed works to the operators. For proper implementation, a Project Operations Manual (POM) is prepared and approved by the Vinh Phuc PPC. The approved POM, which includes technical aspects, financial management

(FM), procurement and contract management, safeguards compliance, and progress monitoring will provide detailed guidance on project implementation.

32. The PMO is supported by relevant technical and operational departments, with expertise mobilized from the existing Project Management Units (PMUs) of the government and donor-financed projects and functional departments in the province. The PMO will be seconded by staff from the respective O&M entities which will be involved in project design and implementation and be responsible for O&M after project completion and handing over.

33. The State Bank of Vietnam (SBV), representing the Socialist Republic of Vietnam (Borrower), will sign a Loan Agreement with the Bank. There will be a Subsidiary Loan Agreement between the Borrower (acting through Ministry of Finance) and the Vinh Phuc PPC, through which the funds and the responsibility to implement the project will be passed on to Vinh Phuc. It is expected that the Subsidiary Loan Agreement will be available before negotiations and will be signed within two months after the signing of the Loan Agreement.

B. Results Monitoring

34. The PMO will be in charge of implementing and running a monitoring and evaluation (M&E) system to track progress and results. An M&E consultant will be recruited by the PMO and will work closely with the staff to monitor progress during project implementation to meet the project's objectives as outlined in the Results Framework.

35. The Results Framework described in Annex 1, which is also a part of the POM, provides the key indicators, targets, and data collection arrangements. M&E activities will provide continuous feedback to the PMO on project performance and impact relating to the various components allowing corrective actions to be undertaken. The frequency of the issuance of these monitoring tables will be determined and modified as needed. The PMO will set up a website for project monitoring and reporting on project progress, as well as collecting feedback from beneficiaries and citizens on project-related activities.

C. Sustainability

36. **The Vinh Phuc PPC has strong commitment to and ownership of this project.** With the support of the central government, the Vinh Phuc PPC initiated the project idea, approaching the Bank for help to address its long-standing challenge of flooding because of its location in the Red River Delta floodplain. This initiative is fully in line with the province's social and economic development plan and its flood and water resource management plan. During the project identification and preparation, all the water-related departments including the DARD, DONRE, DOC, local cities and district governments in the Phan River Basin, and water supply, wastewater, irrigation companies participated in the discussions, consultations, and decision making.

37. **Strong financial capacity in the province and cost recovery arrangements will ensure the project's long-term O&M.** Because of its location, Vinh Phuc Province has established a strong industrial base and associated strong financial capacity for provincial development and management. The project is expected to strengthen the provincial government's financial position because of increased revenues from taxes related to emerging economic

activities resulting from reduction of flood risks and the general improvement in environmental quality in the project areas. The financial analysis shows that the project is not expected to negatively affect the fiscal sustainability (debt service capacity) of Vinh Phuc Province. Its current level of public debt is insignificant as the average value borrowed is only about one percent of provincial revenues. The projected revenue and expenditure pattern for the province show that the debt service as a percentage of provincial expenditures is lower than 1.5 percent and declining over time.

38. **The technical sustainability of the project is supported by the selection of simple designs and technologies for each component to achieve O&M efficiency.** From the technical sustainability perspective, the project will support capacity and skill building of the agencies that will operate the infrastructure. With the support of consultants, technical designs and quality of project activities are expected to be in line with international good practices. This will include the preparation of pumping station operational manuals to effectively operate these in future. The project will support the use of asset management systems to establish specific needs-based O&M systems that aim to ensure that sufficient funds are available for the dedicated use by operators of the infrastructure. Asset management systems determine in a systematic way the maintenance and related budget needs, both annually and long term, and monitor in a transparent manner the actual versus planned maintenance expenditures. The results can easily be publicly disclosed.

39. **O&M responsibilities for the assets to be built.** The O&M of the flooding control structures under Component 1 will be carried out by the provincial irrigation company (Lien Son). The O&M of the small town WWTPs under Component 2 will be carried out by the company, which will be responsible for managing the JICA-financed Vinh Yen City WWTP, either the Vinh Yen Water Supply Company (VYWSC) or the Vinh Yen Urban and Environment Management Company (URENCO), which are in selection process by the PPC. The village-level wastewater treatment facilities will be managed by respective communes and communities. The three companies are either wholly state-owned enterprises (Lien Son and URENCO) or joint stock (VYWSC) with about 90 percent of the total shareholding capital belonging to the government. As no revenues are expected from flood risk mitigation services, the Government will allocate an O&M budget of about 2–4 percent of the initial capital investment. For the wastewater collection and treatment, the VYWSC currently charges an environment fee of 10 percent, added to water bills for wastewater services. This fee is occasionally revised as part of water supply tariffs, according to government regulation. URENCO is a full government-funded company and if selected, the Government will provide the O&M budget together with its drainage services as is the practice now.

40. **An assessment of the financial performance of the three companies shows that their financial performance has been relatively stable during the last three years (2012 to 2014), showing that the provincial government has fulfilled its obligations.** The companies are profitable. With the project, the O&M costs of these companies are expected to increase by about US$4 million, which requires a guaranteed budget allocation from the provincial government and sustainable fee collection from the beneficiaries. The affordability of instituting water and sewerage tariff at full O&M cost will only be an issue for about 3 percent of households in the project area, who earn VND 1 million (US$ 45) or less a month.

41. **The potential reward from better cooperation and improved communication among water-related stakeholders is substantial.** The project will establish a coordination mechanism for river basin management through designating the DARD as a secretariat, where the flood information and early warning system will be located. This secretariat, under the umbrella leadership of the PPC, will serve as a common platform for the various departments and local governments to address water-related challenges, such as flooding, water resource management, water quality control, irrigation, water supply, and sanitation in the Phan River Basin in an integrated manner. The next five years' implementation of the project will enable these water-related parties and project owners to work together such that by project completion, momentum has been created and a mechanism established to ensure the sustainability of integrated water management in the river basin.

V. KEY RISKS

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

A. Overall Risk Rating and Explanation of Key Risks

42. The overall implementation risk is considered Substantial. The key risks to achieving the PDO and mitigation measures are detailed below.

43. **Technical design.** Appropriate technologies will be used for the design and construction of the needed physical interventions under the various components. Efforts will be made to ensure that final designs are sound, suitable for local conditions, and that the proposed works will serve the intended purpose and be sustainable with an acceptable level of O&M requirements. The quality of construction works, as these are large infrastructure projects, has been envisaged as a potential risk. To address such risks, professional consulting firms will be procured to support the PMO in DED and construction supervision. Furthermore, during project implementation, the Bank, together with the PMO, will carry out frequent site visits in addition to regular project supervision to inspect the quality of the works and the functioning of the quality assurance mechanism, to ensure that contractors and consultants are performing as agreed in contract documents.

44. **Institutional capacity for implementation and sustainability.** The substantial risk pertains to a weak capacity within provincial agencies to prepare and implement a complex multisectoral Bank project involving multiple stakeholders with overlapping mandates. This risk is mitigated by the Vinh Phuc PPC's strong commitment to (a) staff and strengthen capacity in project preparation and implementation by mobilizing strong technical and managerial staff from existing departments and project implementation units to the PMO; (b) allocate reasonable financial resources for feasibility study (FS) preparation and DED and bidding document

preparation of the first batch of works and consulting services to ensure the project is ready for implementation by Bank approval; (c) establish a Provincial Steering Committee (PSC) for better coordination and oversight of the project that is chaired by PPC chairman or a vice chairman with participation of the leaders from provincial departments, local governments, and related agencies; (d) assign the PMO as the project owner to speed up the domestic review and approval procedure; (e) engage firms with international experience for engineering design, procurement, and construction supervision and recruit qualified consultants to provide additional support to the PMO in managing the project; and (f) assign provincial companies and communities to undertake O&M of the assets to be built with adequate budget either through government allocation or service fee charges.

45. **Fiduciary risks.** Based on the experiences from the Vietnam portfolio, fiduciary risks including FM and procurement are rated Substantial. This is because of (a) limited experience of the province in managing large donor-funded projects; (b) less familiarity of the province with international financial reporting standards and practices; and (c) weak capacity in planning and budgeting for both government budget and donor-funded activities, which may cause delay in project implementation and disbursement. To mitigate these risks during implementation, a technical assistance component has been included in the project design, which covers implementation support, capacity building, and training activities. The Bank will also organize knowledge exchange visits for the PMO to gain experience from other cities that are working on similar issues and continuously provide training on FM, procurement, project management, and other activities. In addition, the Bank will carry out rigorous FM review.

46. **Environmental and social risks.** Screening for climate change implication has been carried out. The screening concludes that (a) the identified climate and disaster risks include more frequent extreme weather events, such as floods, droughts, and heat waves that can adversely affect agricultural and livestock systems, and pose a hazard to local populations, both for increased mortality from natural disasters and increased communicable illnesses and (b) adaptive capacity is provided in the project's physical and nonphysical components. During the construction, the risk of landslides or subsidence is possible, posing hazards to the workforce and local communities and potentially affecting the environment of the surrounding area. The project has conducted geotechnical surveys on all proposed construction sites, and contractors and construction supervision consultants will take preventive measures as part of site management to ensure that appropriate construction methods are adopted to limit risks.

47. Regarding social risks, the assessment results identified households that will be affected by involuntary taking of land, mostly agricultural land, without any impacts related to loss of business or involving physical relocation—in the first year subprojects. The safeguards instruments prepared contain the measures to address both permanent and temporary impacts, including both compensation and income restoration support for the first-year subprojects, and guidance for those to be prepared during project implementation. Impacts on ethnic minorities (EMs) in one subproject were assessed and confirmed as minor and temporary during construction stage, at the Binh Xuyen area. Therefore, the Ethnic Minorities Development Plan (EMDP) and Resettlement Action Plans (RAPs) for this area were prepared to address the potential social impacts.

VI. APPRAISAL SUMMARY

A. Economic and Financial Analysis

48. Cost-benefit analysis was performed by estimating the averted annual damage cost using the available hydrologic and economic information and reductions in household health cost and labor productivity because of poor environmental sanitation and pollution. These benefits were compared with total project costs. The averted annual damage cost was estimated to be about US$35.2 million per year. A significant share of these averted damage losses accrued to agriculture, forestry, and fishing sectors, which are the main livelihood sources for rural poor people. Averted household health cost and labor productivity loss because of poor sanitation and environmental pollution is estimated to be US$71.85 per capita per year.

49. The net present value (NPV) of the project is estimated to be US$246.3 million using a 6 percent discount rate with an internal rate of return (IRR) of about 16.4 percent (details provided in table 1 and annex 5). Thus, the project is economically viable. The sensitivity of the economic analysis results to discount rate and service life of the project assumptions was assessed based on 30, 40, and 50 years scenarios of assets service life. The results indicate that the NPV is highly sensitive to both discount rate and project service life assumptions. Table 1 summarizes the results of economic analysis.

Table 1. Results of Economic Analysis

Economic Indicators	Discount Rate Assumptions	
	6%	**10%**
NPV (US$, millions)	246.3	99.13
IRR (%)	16.44	16.44
B/C	2.26	1.61

B. Technical

50. The overall project design for Component 1 was based on a study on water resources planning for Vinh Phuc Province. A one-dimensional mathematical model was used to analyze a number of scenarios related to rainfall events at different probability levels and different pumping and drainage possibilities. In total, eight different scenarios were analyzed and the optimal one (within the design parameters set by the government) was selected. The proposed structural interventions include a combination of pumping stations, river dredging, improvement to retention lakes and balancing ponds near pumping stations, sluices, and bridges. The proposed interventions considerably reduce the inundation of economically important and urban areas. Designs will consider technologies that are easy to operate and that can minimize O&M expenses.

51. The project Component 2 supports wastewater collection and treatment in four towns and 33 villages in the Phan River Catchment through rehabilitating and building the drainage and sewerage networks, household connections, and wastewater treatment facilities. The treatment facilities are simple units that include mechanical treatment using bar screens and biological treatment with baffled advanced septic tanks, biological filters, and wetlands. These simple

treatment facilities are low cost in investment and O&M and require low technical skills in O&M.

52. The project will provide implementation support and technical assistance under Component 3. The implementation support will include the PMO's capacity building and the consultancy services for the DED, procurement, and construction supervision. Training and equipment will be provided to the PMO to strengthen its capacity in project management. Consultants will be recruited for preparation of the DED, bidding document preparation, procurement and contract management, construction supervision, safeguard compliance monitoring, project financial statements auditing, project progress monitoring and reporting, and other related activities. The project will also provide capacity building for the entities, which will manage the assets to be built under the project, including (a) asset management strategy; (b) O&M equipment; (c) resources management; (d) labor skills, and so on.

53. The flood information and early warning system consists of the construction of hydrometeorological stations in the province, information collection and transmission systems, data processing to produce flood forecasts, and setup of institutions and procedures for responses. The locations and specifications of the hydrometeorological stations are consistent with the overall national system that is under construction, with financial support from the Bank. The data processing can be outsourced to specialized agencies such as the National Center for Meteorology and Hydrology. The institutional setup includes establishing a unit within the DARD for monitoring and maintaining the data and an additional step of strengthening the DARD as the secretariat and platform for integrated river basin management to support the existing Provincial Board for monitoring floods, typhoons, and emergency response.

C. Financial Management

54. The FM system is designed in accordance with the project implementation arrangement of having a permanent PMO established under the PPC to manage the project and other donor-funded projects of Vinh Phuc Province. The PMO will have one qualified chief accountant assisted by three accountants, reporting directly to the PMO director, to play the key role on FM function of the project. The Vinh Phuc Provincial DOF and the Department of Planning and Investment (DPI) will continue to play the role of government financial agency management—appraising annual budget and final accounts—and the Vinh Phuc Provincial State Treasury will continue to play the role of expenditure control agency, as of regular counterpart-funded projects and other donor funded projects in the province. The proposed project FM arrangements meet the Bank's minimum requirements.

55. The action plan to strengthen the project FM arrangements includes (a) the POM with detailed FM guidelines; (b) qualified experienced personnel in all areas of FM; (c) oversight function of provincial bodies as country system; and (d) adequate budget allocation for both ODA and counterpart funding for project preparation, implementation, and M&E.

D. Procurement

56. Procurement for the proposed project shall be carried out in accordance with the Bank's 'Guidelines: Procurement of Goods, Works and Non-Consulting Services under IBRD Loans and

IDA Credits and Grants by World Bank Borrowers', dated January 2011, revised July 2014 (Procurement Guidelines) and 'Guidelines: Selection and Employment of Consultants under IBRD Loans and IDA Credits and Grants by World Bank Borrowers', dated January 2011, revised July 2014 (Consultant Guidelines). The procedure to be followed for National Competitive Bidding (NCB) shall be in accordance with provisions that are stipulated in the annex to Schedule 2 of the Loan Agreement (NCB Annex). In case of any conflict between the Loan Agreement (LA) and national laws/regulations, the LA shall prevail. For each contract to be financed by IBRD, the method of procurement or selection, cost estimate, prior review requirements, and time frame for implementation shall be agreed between the Borrower and IBRD and duly reflected in the most updated Project Procurement Plan. Guidelines on "Preventing and Combating Fraud and Corruption in Projects Financed by IBRD Loans and IDA Credits and Grants, dated October 2006 and revised January 2011, shall apply to the project".

57. The Board of ODA was established by the Vinh Phuc PPC in March 2014 with the mandates of preparation and implementation of ODA projects in the province. It has been upgraded to a PMO that will report directly to the PPC. A Project Steering Committee will be established with the chairman/ vice chairman as the head and the respective line departments, cities, and districts as the members. The committee will be responsible for project coordination related to line departments and agencies during project preparation and implementation. The PMO will be assigned the role of an implementing agency (IA) responsible for day-to-day project implementation and management, including procurement, FM, safeguards management, project monitoring, and general administration. While the Vinh Phuc PPC is responsible for the approval of updated Procurement Plans and the final approval of bidding results before awarding contracts, the PMO is responsible for the preparation and issuance of requests for bids/proposals/quotations and evaluation of bids/proposals/quotations with recommendation for awarding contracts. The PMO will also be responsible for contract signing, payment to contractors, and handing over the completed works/goods to the operators and or end users.

58. Procurement capacity and risk assessment of the IA was conducted by the Bank team in July and November 2015. The PMO has been established and the Bank has carried out the procurement capacity and risk assessment based on the assessment of capacity and risks of the PMO based on the experience of other projects implemented in the province. The assessment identified major risks that would potentially cause procurement delays, inappropriate procurement decisions, or improper contract management. The detailed risk assessment, as well as recommended measures to mitigate identified risks, are presented under the procurement section in annex 3 and recorded in the Procurement Risk Management Assessment System. The procurement risk for the proposed project is rated as Substantial.

59. The Project Procurement Strategy for Development (PPSD) was developed by the PMO before appraisal. The primary aim of the PPSD is to address how procurement activities will support the PDOs and deliver the best value for money under a risk-managed approach that reflects the country and market contexts. The PPSD is proportional, providing adequate justifications for the selection methods chosen in the Procurement Plan. According to project scope and design, there will be no International Competitive Bidding (ICB) package for construction works under Components 1 and 2 of the project, so all contracts for works will be procured under the NCB procedure. In contrast, there will be large and complex ICB contracts for goods, such as (a) large-value equipment for three pumping stations under Component 1 and

(b) complex and highly specialized hydro-meteorological equipment for flood information and early warning, water resource monitoring, and Supervisory Control and Data Acquisition (SCADA) systems under Component 3. There will also be a large-value consulting contract for DEDs, bidding document preparation, and construction supervision, which should follow the Quality- and Cost-Based Selection (QCBS) procedure. The completed PPSD was available before appraisal and was subject to intensive discussions and finalization during the appraisal.

E. Social (including Safeguards)

60. **Social assessment (SA)**. The SA confirms that the project has an overall positive impact. Negative impacts relate to permanent and temporary land acquisition, affecting the livelihoods, including those with more than 20 percent of their land severely affected by project interventions. The SA findings informed the project design and defined the safeguards instruments to be prepared and used to address the measures for potential adverse impacts.

61. **Involuntary Resettlement (OP 4.12).** Land acquisition is required for the rehabilitation of existing lakes, dredging of rivers, and construction of small-scale roads. OP 4.12 was triggered and a Resettlement Policy Framework (RPF) prepared to guide the preparation of the first-year subproject's Resettlement Action Plans (RAPs) and for those that will be identified during project implementation. Three first-year subprojects' RAPs were prepared for the Sau Vo Detention Lake and Sau Vo Access Road, the Dong Mong Sludge Landfill, and the dredging of the three-river network in Binh Xuyen and construction of the Cau Ton and Cau Sat control gates.

62. There is no physical relocation anticipated for the three first-year subprojects nor impacts to local business (to be confirmed when the detailed design is available). According to the RAPs for the three first-year subprojects, an estimated 1,916 households will be permanently affected (agricultural land), of which 952 households (about half the total affected households) will lose more than 20 percent of their agricultural land. The estimated cost for land acquisition for the first three RAPs is US$13.5 million. There will be some permanent and temporary land acquisition required for dredging and construction activities that may also affect current fishery and farming activities. Both permanent and temporary impacts on land, fishing, and farming activities will be compensated according to the prepared RPF.

63. **Indigenous Peoples (OP 4.10).** Once the presence of Ethnic Minorities (EMs) were confirmed in the subproject area, the Ethnic Minority Policy Framework (EMPF) was prepared, built on the SA findings conducted in prior consultations. The EMPF guided the preparation of the first-year subproject and will be used for those to be identified during project implementation. The subproject in Binh Xuyen (dredging of river) is the only first-year subproject that could temporarily affect an estimated number of 20 EM households. The Ethnic Minorities Development Plan (EMDP) reflects the EMs demands gathered in free, prior, and informed consultation, which incorporated culturally appropriate activities to be supported, such as farming and forestry practices. In addition, the RAP for Binh Xuyen has been prepared to ensure potential temporarily affected EMs get compensated in accordance with the project's RPF.

64. **Gender and other social impacts.** A gender analysis (GA) was carried out, as part of the SA, to examine gender-related issues so as to promote gender equality and enhance the project's development effectiveness. A gender action plan and monitoring plan was developed on the basis of the GA, to enable gender mainstreaming for the identified subprojects during project implementation. For subprojects to be defined during project implementation, a GA, as part of the SA for the defined subproject, will be developed to inform the investment design and development interventions. With regard to other social impacts, and based on the assessment results, other instruments were prepared to ensure project benefits and inclusion. In doing so the Gender Action, Public Health, and Communication Plans were prepared.

65. **Social safeguards implementation.** The implementation of the RAPs and EMDPs will be the responsibility of the Vinh Phuc People's Committee. The costs for land acquisition (comprising the costs to support livelihood restoration of affected households) will be financed by the Vinh Phuc People's Committee. These include the total costs set forth for implementation of the EMDP of Binh Xuyen and other potential EMDPs identified during project implementation. The Bank's technical support for the RAP and EMDP implementation, as for further safeguards requirements, will ensure adequate implementation and monitoring, complemented by the Vinh Phuc PMU technical support provided by their appointed social staff and consulting firm support, as required.

66. **Consultation, participation, and disclosure.** During project preparation, consultation and participation with locals were carried out through qualitative and quantitative methods (surveys, community meetings, and focus groups), including representatives from both project beneficiaries and adversely affected households. The survey covered 965 households (3,770 people); public consultation in 21 communes/wards (including 172 people); and community meetings (including 392 people).

67. The social safeguard documents, including the RPF, EMPF, SA, three RAPs, and one EMDP (Binh Xuyen subproject area), were disclosed in English at the Bank's InfoShop on November 17, 2015 (RPF, EMPF); November 19, 2015 (three RAPs, one EMDP); and November 20, 2015 (SA), before the project's appraisal, and locally at the project sites and on the website of the Vinh Phuc DPI. Specifically, the RPF, EMPF, SA, three RAPs, and one EMDP (Binh Xuyen subproject) were disclosed on the Vinh Phuc DPI's website on November 24, 2015 and locally at the project communes on November 24, 2015.

F. Environment (including Safeguards)

68. OP/BP 4.01 is triggered and the project is classified as Category A because of the potentially significant and irreversible environmental and social impacts associated with the flood control measures, in particular the dredging activities. As a Category A project, a full-scale ESIA is required according to the Bank's safeguard policies. The borrower was provided with the Bank Group Environmental Health and Safety Guidelines, which, with the sector-specific guidelines, provides guidance on best practice occupational and community health and safety procedures. The project triggers Environmental Assessment (OP 4.01), Natural Habitats (OP 4.04), Physical and Cultural Resources (OP 4.11), Safety of Dams (OP 4.37), and Projects on International Waterways (OP 7.50).

69. **The project has numerous positive environmental and social impacts.** It will reduce flooding in the Phan and Ca Lo River Basins (leading to opportunities for increased growing seasons and additional income for rural households); rehabilitate the ecological environment (upon project completion and during operation) through the establishment of regulation reservoirs; and will strengthen and improve the capacity of existing wastewater management systems. Wastewater treatment undertaken under the project will lessen the pollutant load in the Phan River, which currently receives untreated domestic and (small) industrial waste discharge. The project also plans to include some capacity building on improved waste management and collection processes in the councils of villages and communes along the Phan River. The project area does not contain any national forests, nature reserves, ecologically sensitive areas, nor any endangered flora or fauna.

70. Project activities have positive impacts for the control and minimization of floods and for the improvement of the riverine environment through the establishment of WWTPs. However, there are several key site-specific negative impacts of the project civil works. The key impacts are (a) risk of erosion and subsidence of the river and lake banks; (b) localized flooding impacting local populations; (c) impact of dredging process on water quality and aquatic life and downstream users; and (d) construction of disposal sites. The key impacts because of the construction of disposal sites include dust, odor, and gases generated from dredged sludge; improper disposal of contaminated excavated materials to the designated disposal site; and land subsidence risk at the Dong Mong disposal site during construction. Transportation of dredged material to disposal sites, if not properly organized and scheduled, will expose sensitive receptors to noise and dust and restrict access. This impact is temporary and will only occur during the construction period. Sensitive receptors include several schools, one market, one clinic, and one pagoda at a distance of 30–70 m to the transportation routes. Because of aquaculture activities in the three regulatory lakes, and the fact that they do not contain migratory species, according to DONRE, impacts on aqua fauna in the lakes caused by dredging activities will not be significant.

71. Cumulative impacts of the ongoing and proposed projects in the project area are positive, in that through the installation of WWTPs in both residential areas and industrial parks, the pollution load of untreated waste on the rivers is reduced. Moreover, several projects lead to improved flood control, which has economic and health and safety benefits to local communities. The existence of dredge disposal sites and extrajudicial sand extracting activities in the project area does continue to place pressure on river water quality, and it is suggested that Vinh Phuc authorities, in collaboration with DONRE, prepare a management plan to curb and control these activities and restrict release of these materials into the river.

72. Although there will be changes in the hydrology of the Phan, Ca Lo, Pho Day, and Red Rivers, because of flood risk management measures, there will be no net abstraction of water from the rivers. With regard to water flow, it is estimated that a total of discharge flow of 115 m^3 per second will be pumped from the two pumping stations of Ngu Kien and Nguyen Duc to the Red River and 30 m^3 per second from the Kim Xa pumping station to the Pho Day River. Water then flows to the Pho Day River to the Lo River and back to the Red River (17 km upstream of the Ngu Kien pumping station discharging canal). Therefore, the water flow in the Red River will be increased by a total of 145 m^3 per second from the three pumping stations, which is insignificant compared to the maximum drainage capacity of 18,000 m^3 per second in the storm

season. The Ca Lo River in the project area has an average river width of 20 m and depth of 1.7 m. There are no aquafarming activities in the river and about 22 households fish there during the off-season period. The hydrological analysis indicates that minimal ecological flow should be sustained, given the total volume of the river compared to the relatively small change in water flow. Moreover, according to the information provided from the Vinh Phuc Department of Natural Resources and Environment (DONRE) and the Department of Agriculture and Rural Development (DARD), there are no endangered fish species within the project area nor are there any migratory species located in the regulatory lakes.

73. **Physical Cultural Resources (OP/BP 4.11).** In the project area, there are several grave-yards that will need to be relocated from the Dong Mong disposal site. As the cemetery area was flooded during the survey period, it was not possible to ascertain the exact number of graves to be relocated. There is also a risk that project activities will have an impact on the Thien Phuc Church and the Great Banyan Tree (in Chua Village) in the Van Xuan Commune. Given that the project involves large excavation activities, chance find procedures are detailed in the Environmental and Social Impact Assessment (ESIA) and will be incorporated into the bidding documents.

74. The ESIA was disclosed in-country on December 20, 2015, and in the InfoShop on December 30, 2015. Two public consultations were carried out during preparation of the project ESIA, the first on August 15, 2015, and the second on December 30, 2015. In line with the government's consultation procedures, the first consultation was conducted to collect opinions from the DPI, DONRE, DOC, Department of Transportation (DOT), DARD, and representatives from the seven districts or cities of Vinh Yen, Phuc Yen, Tam Duong, Tam Dao, Binh Xuyen, Yen Lac, and Vinh Tuong. The number of participants was 229, including leaders of People's Committees (PCs) of communes, wards, townships, community representatives, and leaders of hamlets/neighborhoods in 56 wards/communes/townships in the project area. All comments and concerns expressed during the consultation were considered during the preparation of the project's feasibility studies. The second consultation focused on the results of the impact assessment and the proposed mitigation measures.

75. **Safety of Dams (OP/BP 4.37)**. The project does not involve the construction of any new dam. However, two large earth-fill dams—the Xa Huong Dam (41 m high and total storage of 14.13 million m^3) and Thanh Lanh Dam (29 m high and total storage of 10.62 million m^3)—are located upstream of project supported structures in Basin C. As a result, OP/BP 4.37, Safety of Dams, is triggered. During project preparation in 2015, Vinh Phuc Province engaged a dam safety review team to conduct the dam safety review. The two dam safety assessment reports classified Xa Huong Dam as an unsafe dam. Subsequently, Vinh Phuc Province allocated funds from various sources to implement remedial works, including two phases of the dam body seepage control fully completed in January 2016 and spillway expansion planned to be completed by end of April 2016. With the completion of these two major remedial works, the Xa Huong Dam will be upgraded to an acceptable safety level.

76. To ensure proper operation of the dams, Vinh Phuc requested Bank support to complete all the outstanding remedial works, including the renovation of irrigation tunnel and its intake of the Xa Huong Dam, installation of instruments of both dams, as proposed by the dam safety review team under another Bank-supported project, that is, the Vietnam Dam Rehabilitation and

Safety Improvement Project, which was approved by the Bank's Board of Executive Directors on December 15, 2015. The application was submitted to the Ministry of Agriculture and Rural Development (MARD) on December 7, 2015. In addition, to ensure the safety of the dams, proper Operational and Maintenance Manuals, Reservoir Operational Rules, and Emergency Preparedness Plans were required to be prepared and established for these two dams as immediate actions to be taken and Vinh Phuc has committed to engage the competent expert to do so. Such review will be reflected in the second semiannual project implementation report and reviewed by the Bank team.

G. Other Safeguards Policies Triggered

77. **Projects on International Waterways.** The project triggers OP 7.50 as the interventions in Component 1 will affect the Red River, an international waterway originating in China. In Component 1, two of the three proposed pumping stations, one with capacity of 80 m^3 per second and the other 35 m^3 per second, will be built for flood control purposes. They will discharge water to the Red River. The Red River is considered an international waterway to which the Bank's OP 7.50 - Projects on International Waterways applies (Attachment 1). OP 7.50 requires that a notification of such projects be made to all riparian states, in this instance to China. At the request of the Government of Vietnam, the Bank has undertaken such notification to China in accordance with paragraph 4 of OP 7.50. No response to the riparian notification was received by the established deadline or since.

H. World Bank Grievance Redress

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

ANNEX 1: RESULTS FRAMEWORK AND MONITORING

Country: Vietnam

Project Name: Vinh Phuc Flood Risk and Water Management Project (P152460)

Results Framework

Project Development Objectives

PDO Statement

The PDO is to strengthen flood risk management capacity and improve wastewater management in the central catchment of Vinh Phuc Province.

These results are at	Project level

Project Development Objective Indicators

Indicator Name	**Core**	**Baseline**	**Cumulative Target Values**									
			YR1	**YR2**	**YR3**	**YR4**	**YR5**	**–**	**–**	**–**	**–**	**End Target**
Direct project beneficiaries (Number)	X	0	0	11,501	100,767	186,572	376,065					376,065
Female beneficiaries (Percentage - Subtype: Supplemental) - (Core)	X	0.0	0.0	50.8	50.8	50.8	50.8					50.8
People benefited from flood risk control (Number)		0	0	0	21,075	76,539	255,130					255,130
People provided with access to improved sanitation facilities under the project	X	0	0	11,501	79,692	110,033	120,935					120,935

(Number) (Core)												
Surface area protected from a 10-year return period flood event (%)		0.0	0.0	0.0	2.4	8.4	68.2					68.2
Protocol for integrated water resource management approved by the PPC (Text)		No	No	No	No	Yes	Yes					Yes

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Intermediate Results Indicators

Indicator Name	Core	Baseline	Cumulative Target Values									
			YR1	YR2	YR3	YR4	YR5					End Target
Construction of flood embankments and river rehabilitation (Kilometers)		0.0	10.0	21.4	35.9	35.9	35.9					35.9
Surface area protected from a 10-year return period flood event (Hectares)		0	0	0	137	480	5,720					5,720
Number of structures constructed, including pumping stations, flood control gates, canals, and reservoirs (Number)		0	0	2	5	20	53					53
Increased storage capacity of retention lakes (Volume m^3)		0	0	450,000	2,700,000	3,854,608	3,854,608					3,854,608

New household sewer connected under the project (Number)		0	0	0	922	2,322	4,338					4,338
Wastewater treatment facilities constructed (Number)		0	0	13	26	33	38					38
Volume (mass) of BOD pollution loads removed by the treatment plant supported under the project - (Tons/year) (Core)	X	0	0	31	139	231	258					258
Flood early warning system established and operational (Yes/No)		No	No	No	No	Yes	Yes					Yes
TA contracts signed to strengthen PMO capacity (Number)		0	2	3	6	7	8					8
Trainings provided to the provincial departments and O&M entities (Number of courses)		0	0	1	4	9	13					13
Grievances registered related to delivery of project benefits that are actually addressed (Percentage)		0	20	30	40	50	60					60

Indicator Description

Project Development Objective Indicators

Indicator Name	Description (indicator definition and so on.)	Frequency	Data Source/Methodology	Responsibility for Data Collection
Direct project beneficiaries	This indicator measures the actual number of people who will benefit from flood risk control, improved access to wastewater drainage services, and the environment.	Semiannual	Progress report from the PMO	PMO
Female beneficiaries	This indicator measures the actual number of female beneficiaries who will benefit from flood risk control, improved access to wastewater drainage services, and the environment.	Semiannual	Progress report from the PMO	PMO
People benefited from flood risk control (Number)	This indicator measures the targeted population who will be protected from floods in the specified period by structural intervention (calculated using the hydraulic model and map overlay) financed under the project.	Semiannual	Progress report from the PMO	PMO
People provided with access to 'improved sanitation facilities' under the project	Households whose wastewater is collected and/or treated by wastewater collection and treatment facilities financed under the project	Semiannual	Progress report from the PMO	PMO
Surface area protected from a 10-year return period flood event (%)	This indicator measures the ratio of the targeted area that will be protected from flood in the specified period against the total area that is currently prone to floods. Measured with dividing the areas protected by the works (hydraulic modeling) financed under the project to the total area that is currently prone to the floods as 8,390ha.	Semiannual	Progress report from the PMO	PMO
Protocol for integrated water resource management approved by the PPC	The protocol for integrated water resource management is developed and approved by the Vinh Phuc PPC.	Semiannual	Progress report from the PMO	PMO

Intermediate Results Indicators

Indicator Name	Description (indicator definition and so on.)	Frequency	Data Source / Methodology	Responsibility for Data Collection
Construction of flood embankments and river rehabilitation	Measured with the actual length of rivers improved by embankment or dredging. Includes 4 rivers in Binh Xuyen with a total length of 21.4 km and the Phan River with a total length of 14.5 km.	Semiannual	Progress report from the PMO	PMO
Surface area protected from a 10-year return period flood	This indicator measures the targeted area that will be protected from flood in the specified period. Measured	Semiannual	Progress report from the PMO	PMO

ANNEX 2: DETAILED PROJECT DESCRIPTION

SOCIALIST REPUBLIC OF VIETNAM: Vinh Phuc Flood Risk and Water Management Project

Component 1 - Flood Risk Management

1. Vinh Phuc Province is located in the transition zone between the mountainous region and the North Delta of the Red River. The north has the Tam Dao Mountain range with the Dao Tru mountain Peak having an elevation of 1,592 m. The Ca Lo River runs from east to west along the boundary of the mountain and plain and the Red River runs north to south along the west provincial boarder. The terrain of Vinh Phuc Province is high at its northwest and runs gradually down to the lowland southeastward. The project area, the economic center of the project, covers 720 km^2 of the Phan River Basin, and has mountains and hilly area on its north, with the elevation from elevation 300.0 m to 700.0 m, and flood plains, with the elevation varying from elevation 10.0 m to 12.0 m, at the central and southern part of the basin.

2. The project area covers the entire Phan River Basin, with a catchment area of 398.5 km^2, and upper reaches of the Ca Lo River, about 13 km with a catchment area of 311.2 km^2. The area has very complex hydrological and hydraulic conditions. The Phan River originates from the Tam Dao Mountain Range and serves as the main channel, with width ranging from 20.0 m to 50.0 m and river bed elevation from 9.6 m to 3.0 m, running 64.5 km from north to south and then to east, to discharge the water, collected from a number of creeks/rivers and ponds/lakes, into the Ca Lo River and then about 110 km to the sea. To better understand the topographic and hydrological features of the project area, the Phan River Basin, referred to as Basin B, is divided into three sub-basins, that is, B1 the northern, B2 the southwestern, B3 the center, and discharges water into the upper reaches of the Ca Lo River, referred to as Basin C.

3. Rainfall in the project area is unevenly distributed over both space and time. According to the meteorological records from 1962 to 2010, the annual mean precipitation varies from 1,575 mm at the Vinh Yen Station in the center of the area and the south to 2,439 mm in the north mountainous area at the Tam Dao Station. About 70 percent to 85 percent of the rainfall at the central and southern part occurs in June, July, and August but in mountainous areas, sets in one month later. The heavy rainfalls brought by the Northeast monsoons usually covers the entire project area and lasts for 3 to 5 days during the rainy season.

4. As heavy rain occurs in the project area usually at the same time as that in the Ca Lo River Basin, the water downstream in the Ca Lo River forces the water level in the Phan River too high for natural drainage, which results in waterlogging or inundation up to 2.5 m in some places that last 10 to 20 days. These waterlogging and flooding events affect agriculture, transport, industry, and livelihoods in the province. There are existing flood infrastructures, including five small and medium capacity pumping stations as well as sluice gates, but most of these infrastructures date back to the French period and are barely functioning or are out of operation. Besides outdated infrastructure, there is not enough pumping and retention capacity, rivers and drains are silted, and there are not enough regulating structures to manage floodwater.

5. A commonly used numerical hydrodynamic model was used to conduct the flood risk assessment and verify the design scenarios. The model was properly calibrated and validated based on the data available. The August 2013 flood event has been used to develop the model and validation of the model was carried out through the review by a technical team from a reputed international consulting firm. A 2D model was used to prepare the flood risk maps that helps determine the area of flood damages. The model results confirmed the key causes of the floods and waterlogging in the project area, that is, quick runoff generation from mountainous and hilly areas in the north, lower discharge capacity of the Phan River, and gentle hydraulic profile along the Phan River because of the higher water level at its conjunction with the Ca Lo River. Alternative analysis with various design scenarios against the storms of different return periods was carried out to determine the design scenarios. Based on such an analysis, it was determined to invest in structural measures to protect the project area from being flooded by storms with a 10-year return period and nonstructural measures to reduce the damages caused by storms with a probability of over 10 percent. The model was used to verify the design scenarios to ensure the adequacy of the design of structures.

6. As determined by the assessment and analysis, the proposed strategy on flood risk management is to create retention storage in three subbasins of the Phan River to better regulate the peak floods, which will also serve as the water reservoirs during the non-flood season, to build one pumping station in each subbasin to pump out the excessive flood water out of the basin, and to dredge key sections of the Phan River to increase its discharging capacity. Based on this strategy, the project proposed to support (a) dredging of three existing lakes to increase their retention capacity that will help store the peak of the runoff generated in the basin; (b) construction of three pump stations, with a total capacity of 145 m^3 per second, to divert the excessive runoff to the Pho Day River from the upstream stretches and the Red River from the middle reaches of the Phan River; (c) dredging of key sections and renovation of some cross-river structures to improve the discharging capacity of the Phan River; and (d) construction of two sluice gate structures at the conjunctions with the Ca Lo River to prevent the floods entering into the Phan River Basin when necessary. The nonstructural measures, including a pre-warning system and flood emergence response plan, are proposed to be developed to reduce the damages and losses of lives when a storm with over 10-year recurrence occurs.

7. The activities proposed to be undertaken for the subbasin are given below:

(a) **Subbasin B1.** Dredging the Nhi Hoang Lake to serve as a retention lake, with the storage of 750,000 m^3, and construction of a 3 ha dumping site—mostly in the form of backfilling the previously low-lying land to receive the dredged materials from the lake; construction of the Kim Xa Pump Station, with a design capacity of 30 m^3 per second, two concrete culverts at K3+128 and K13+300, excavation of a 313.0 m long discharging canal; and repair of a sluice gate structure.

(b) **Subbasin B2.** Dredging of a retention lake with a storage of 1.35 million m^3, construction of the Ngu Kien Pump Station, with a design capacity of 35 m^3 per second, and excavation of a 3.96 km approach canal, with seven sluice gate structures and four access bridges along the canal, and a 5.7 km discharge canal with a culvert at Dike Ta Hong, dredging key sections along 31.62 km of the Phan River, as well as the construction of two new sluice gates.

(c) **Subbasin B3.** Excavation of a 7.71 km approach canal, a regulating pond with the storage of 1.45 million m^3, and 3.08 km of a discharge canal, with associated sluice gates and other structures; dredging of the Sau Vo Lake, with a storage of 4.0 million m^3 and key sections along 18.4 km of the Phan River; construction of the Dong Mong soil dumping site with an area of about 58 ha; and construction of a 3.7 km service road with a width of 10.5 m.

(d) **Subbasin C.** Dredging of total 21.38 km of four rivers, that is, the Cau Bo River, Tranh River, Ba Hanh River, and Noi River, and construction of two sluice gate structures at Cau Ton and Cau Sat.

Component 2 - Water Environment Management

8. The water quality monitoring data from the provincial DONRE and additional sampling work conducted by the consultant during project preparation suggest that water pollution happens mostly with high concentration of BOD_5 and coliform in the section between the Thuong Lac and Lac Y control gates of the Phan River. The main sources of pollution are from the domestic wastewater discharges from the towns and villages in the Phan River Catchment. Wastewater generated from industrial parks are treated before discharge. Four towns and 33 villages were identified based on the selection criteria of (a) the size of the population; (b) the distance to the Phan River; and (c) the availability of piped water supply system, which is developed under either the government's program or the ongoing Bank-financed Program for Results (PforR) for rural water supply and sanitation. The total population in these towns and villages is about 150,000. The proposed interventions through the project include rehabilitation and construction of sewerage network, household connections, and wastewater treatment facilities.

9. The wastewater generated from the towns and villages is mostly domestic and partly from livestock farming activities. The majority of the households in these towns and villages use septic tanks to primarily treat the wastewater before discharge to the drain network, mainly in the form of an open channel along the roads. The drain network is a combined system that conveys both stormwater and wastewater. Under the project, these open drains will be rehabilitated and upgraded with a proper covering. In addition, the network will be extended by constructing new primary, secondary, and tertiary sewers to provide services to the 4,300 unconnected households in the towns and villages. To separate wastewater from combined drain before its discharge to the environment, interceptors with combined sewer overflow chambers will be constructed. Intercepted wastewater will be transferred to wastewater treatment facilities either by gravity or through relay pumping stations. In total, there are about 20 relay pumping stations with more than 5 km of pressurized pipeline.

10. Wastewater treatment facilities are simple and consist of low anaerobic digestion tanks equipped with a trash removal unit at influent and an additional wetland at effluent. Similar wastewater treatment facilities are widely used in Vinh Phuc Province in the country and demonstrate their simplicity and efficiency. The proposed treatment facilities can treat the influent wastewater with BOD_5 level varied from 120 mg per liter to 150 mg per liter to the level requested by the government's effluent standards as 50 mg per liter without using energy and with less volume of sludge generated. Thirty-eight wastewater treatment facilities are planned to

be constructed, with capacity varying from 300 m^3 per day to 2,500 m^3 per day, from which five facilities are for three towns (Yen Lac, Tam Hong, and Vinh Tuong) and 33 facilities are for 33 rural villages. One town, Huong Canh, only needs to build sewer and collection systems as there is an existing Quat Luu WWTP, which was constructed to treat wastewater for Vinh Yen City and Huong Canh Town with an initial capacity of 5,000 m^3 per day.

Component 3 - Implementation Support, Technical Assistance, and Institutional Strengthening

11. Project implementation support is to ensure that the project is implemented properly. For that purpose, the capacity of the project implementing unit (PMO) needs to be strengthened and several consultancies need to be employed. The PMO's capacity building includes (a) providing office equipment, hardware, software, and transportation and (b) providing training courses or study tours on project management to the PMO's staff. The consulting services needed include (a) consultant for preparation of Detailed Engineering Design (DED) and bidding documents, procurement and contract management, construction supervision; (b) consultant for safeguard compliance monitoring; (c) consultant for auditing the project financial statements; (d) consultant for project progress monitoring and reporting; and (e) other consultancies.

12. The technical assistance focuses on strengthening the capacity of the province in the field of integrated river basin management and flood risk control. This includes establishment of flood information and early warning system for the province and other related water resource and water quality monitoring in the Phan River Basin. In addition, institutional strengthening and capacity-building activities will be carried out for the O&M services. For the water quality monitoring, the government (DONRE) has committed to building the water quality monitoring system as part of the government's overall environmental monitoring program in Vinh Phuc. It includes 10 stations for air quality monitoring, 11 stations for ground water monitoring, 13 stations for surface water monitoring, and 13 stations for sludge monitoring in reservoirs or lakes. The Bank was furnished with the confirmation letters from the Vinh Phuc PPC (Letters No. 2273, 2974, and 2494) of this program.

13. The flood information and early warning system includes a number of hydrometeorological stations constructed in the Phan River Basin that transfer information to the local DARD for storage and processing. Given the capacity of the DARD, it is desirable that processing collected information is performed by a special agency at the central level based on a contractual agreement. The forecasts generated from the data processing are transferred back to the provincial committee for preventing floods and disasters, for which the DARD is a standing member. The committee, based on received forecasts and working protocol, can make decisions on how the province may react to that event. The project will support the province in (a) providing necessary civil works, equipment, and consulting services for developing and establishing the water monitoring and hydrometeorological systems; (b) setting up the institutional arrangements that will be strengthened by varied consultancies; and (c) drafting working protocol for water resource management and flood prevention. The assets created from the projects will be transferred to the DARD for O&M.

14. Capacity building for O&M entities is part of Component 3. The existing Lien Son irrigation management company will be responsible for O&M of flood control assets such as

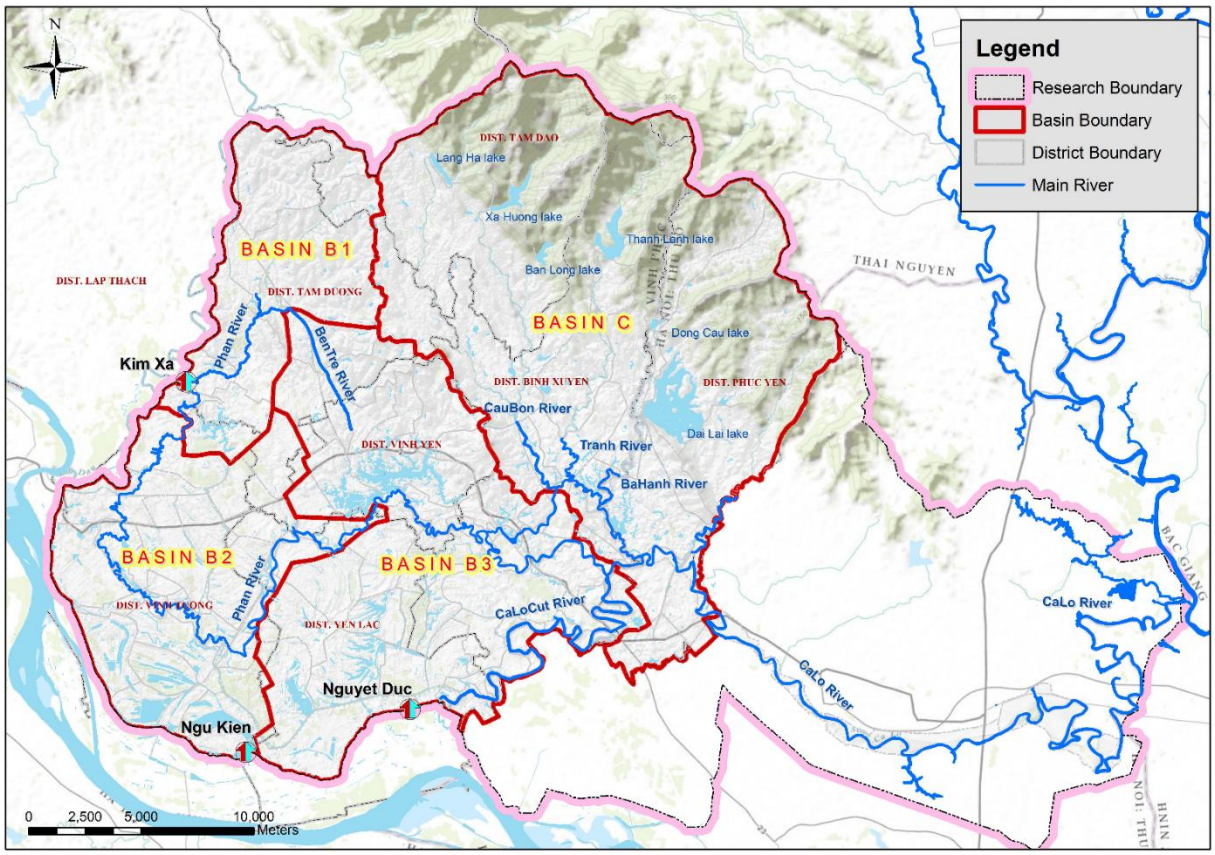
pumping stations, canals, lakes and gates. The assessment of the company's capacity shows that some areas of that company will need to be strengthened. It includes (a) asset management strategy; (b) O&M equipment; (c) resources management; and (d) labor skills. The wastewater collection and treatment system in the towns will be managed by the company, which is to manage the JICA-financed Vinh Yen City WWTP. The selection of the operator for this WWTP is in progress. It will be one of the two Vinh Phuc companies, the VYWSC and the Vinh Yen City URENCO. The O&M for village-level wastewater treatment facilities will be the responsibility of the respective communes and communities. Capacity-building activities are arranged under the project through a number of consulting services for trainings.

Table 2.1. Summary Cost Estimate by Components, Vinh Phuc Flood Risk and Wastewater Management (US$, millions)

No.	Description	Project Baseline Costs	Total Costs, including Contingencies	Bank Financing	Vinh Phuc Province
Component 1 - Flood Risk Management		**143.45**	**173.84**	**109.42**	**64.42**
1.1	Construction of the Kim Xa Pump Station, 30 m^3/s, the Nhi Hoang Lake and Structures along Upper Reaches of Phan River in Basin B1	16.67	20.13	12.44	7.69
1.2	Construction of the Ngu Kien Pump Station, 35 m^3/s, River Dredging and Structures along the Middle Reaches of Phan River in Basin B2	31.85	38.42	24.13	14.29
1.3	Construction of the Nguyet Duc Pump Station, 80 m^3/s, and Dredging of the Sau Vo Lake with its Connecting Canals and Lower Reaches of the Phan River in Basin B3	82.78	100.36	62.61	37.74
1.4	Construction of two sluice gates and dredging of three rivers in Basin C	12.14	14.93	10.24	4.69
Component 2 - Water Environment Management		**16.78**	**20.31**	**14.73**	**5.58**
2.1	Construction of wastewater collections and treatment facilities in four towns	9.03	10.90	7.93	2.97
2.2	Wastewater management in 33 rural villages	7.75	9.42	6.80	2.61
Component 3 - Implementation Support, Technical Assistance, and Institutional Strengthening		**14.55**	**16.39**	**16.39**	**–**
3.1	Assistance in project implementation	10.83	12.18	12.18	–
3.2	Information, education, and communication	2.81	3.18	3.18	–
3.3	Capacity building for O&M entities	0.61	0.69	0.69	–
3.4	Consultant for establishment of regulation on managing water resources by river basins	0.30	0.34	0.34	–
Total Project Baseline Costs, including Value-added tax:		**174.78**	**210.54**	**140.54**	**70.00**
	Contingencies:	35.77	–	–	–
	Physical Contingency	16.63	–	–	–
	Price Contingency	19.14	–	–	–
Total Project Costs, including Value-added tax and Contingencies:		**210.54**	**210.54**	**140.54**	**70.00**
	Financing Costs:	9.46	9.46	9.46	–
	Front-end Fee	0.38	0.38	0.38	–
	Commitment Fee	1.20	1.20	1.20	–
	Interests During Construction	87.88	7.88	7.88	–

Total Project Investment Costs:	**220.00**	**220.00**	**150.00**	**70.00**

Figure 2.1. Vinh Phuc Province Basin Map



Source: Vinh Phuc Provincial ODA Management Board Project Preparation consultants

ANNEX 3: IMPLEMENTATION ARRANGEMENTS

SOCIALIST REPUBLIC OF VIETNAM: Vinh Phuc Flood Risk and Water Management Project

Project Institutional and Implementation Arrangements

Vinh Phuc Provincial Institutional Structure

1. **The PPC** is the decision-making authority that directs all investments in Vinh Phuc Province, including the formulation of investment project and appraisal and approval of investment projects. Specifically, the PPC is responsible for approval of the FS, basic designs, detailed designs, bidding documents, total investment cost, bidding schedule, counterpart fund allocation in the province, and other issues related to this project. The PPC is supported by the following key sectoral departments:

- **The DPI** is the main agency responsible for the formulation of strategies, master plans for socioeconomic development of the province, and setting of strategic directions and mechanisms for domestic and foreign investments. The DPI collaborates with other departments and sectors in the planning and management of investment projects at the provincial level. The DPI's main responsibilities include appraisal of bidding documents, investment components, total investment cost, bidding schedule, and formulation of counterpart fund allocation schedule of the province for the project.

- **The DOF** manages the central state budget allocated for the province for domestic and foreign investment development activities in the province. The DOF works closely with other provincial departments such as the DPI and appraises investment components and total investment cost and determines the counterpart fund allocation schedule of the province for the project.

- **The DOC** is the department concerned with the construction, urban planning, and infrastructure development in the province. The DOC is responsible for the verification, appraisal and approval of construction works locally. The DOC is responsible for appraisal of the FS, basic designs, detailed designs, and other technical issues under the project.

- **The DARD** is the lead agency at the provincial level, responsible for water resources management, agriculture development, disaster risk prevention, and other related public services under the agriculture and rural development sector in the province. Accordingly, the DARD is the designated department in charge of flood prevention and search and rescue operations in the province related to the project work.

- **The DONRE** is responsible for the management of land, water, and environment resources related to the project works and is concerned with oversight of the review, approval, and regulations with regard to the ESIA and EMP.

- **The District People's Committee (DPC),** under the PPC's overall guidance and leadership, is responsible for the management of local districts as stipulated by the laws. Under the DPC, the Division of Natural Resources and Environment has been established to provide guidance and support in the environmental sector.

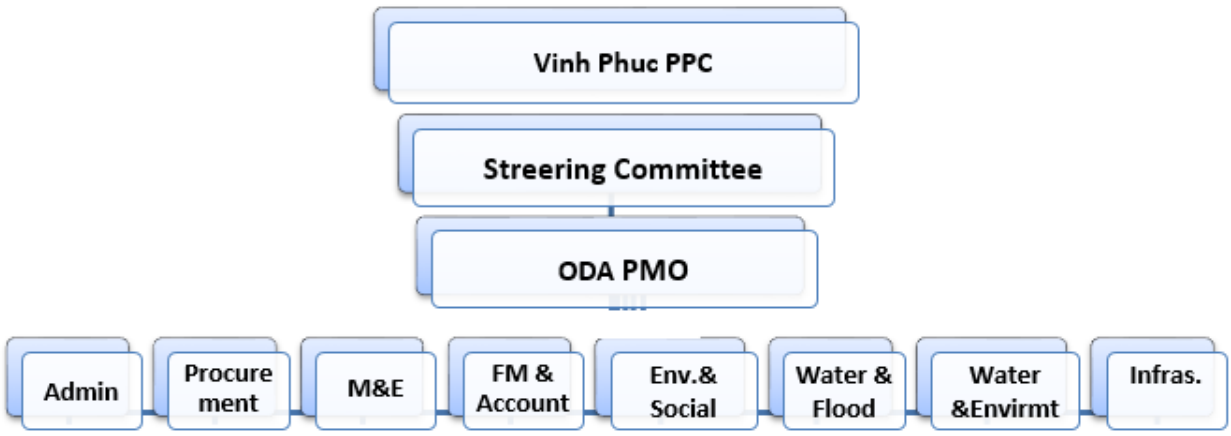
2. **Commune and town PC** is an administrative level under the district PC, responsible for the management of issues in communes and towns as stipulated by the laws. Commune/town PC is a functional unit of the PC and helps in managing environment and water supply and drainage.

PMO Arrangement for Project Implementation

3. **Project Steering Committee.** The Vinh Phuc PPC will establish a PSC for overall coordination and guidance during project implementation. The committee will be chaired by the chairperson or a vice chairperson of the PPC and its members will be directors of related provincial departments such as the DPI, DARD, DONRE, DOF, and DOC. The PSC also includes the chairperson of participating cities and districts such as Vinh Yen, Tam Duong, Yen Lac, Vinh Tuong, Tam Dao, Binh Xuyen, and Phuc Yen. The PMO will serve as a secretariat for the PSC. The PSC will meet quarterly and on a needs basis to make decisions and give guidance on issues that goes beyond the PMO's authorization.

4. **The Vinh Phuc Official Development Assistance (ODA) PMO.** The ODA PMO plays the role of project owner, as designated by the Vinh Phuc PPC. The PMO is concerned with the management and implementation of the project; contract signing in accordance with the law; organizing the implementation and approving designs and total construction cost estimation; and bidding, negotiation, signing, and monitoring the implementation of the contract. The PMO implements the project under the PPC's direction and through the PSC, the PMO is responsible for the overall implementation and management of the project, including procurement, FM, safeguards management, project monitoring, and overall administration. The PMO coordinates the activities with related provincial departments, localities, and other projects in the province as well as with central ministries: the Office of the Government, Ministry of Planning and Investment, MoF, MARD, Ministry of Construction, and other DPs. The PMO will also be responsible for payment to contractors and handing over the completed works to the operators. Under the project and during project implementation, the PMO capacity will be strengthened through the project Component 3.

Figure 3.1. Hierarchy Diagram and Administration Mechanism



O&M Arrangements

5. For the assets of Component 1, the provincial irrigation company, Lien Son, will be responsible for O&M. Lien Son has about 400 staff. The company has a board of directors; the senior management team (one director, two deputies); five departments; and various subsidiary operational units under the departments. Component 3 assets will be operated and maintained by the Vinh Phuc Department of Engineering. B1, B2, and B3 and the two water sluice gates will be assigned to four subsidiaries under this company, namely B1 to Vinh Tuong Irrigation Company, B2 and B3 to Yen Lac Irrigation Company, and two gates to Vinh Yen Irrigation Company and Binh Xuyen Irrigation Company. The four companies have 176 staff; about 30 percent are professionals, including water resource management and mechanical engineers. Lien Son plans to recruit 40 more professionals for the assets to be handed over to them when the Vinh Phuc Flood Risk Water Management Project (VPFRWMP) is completed. A TA package has been included in Component 3 for training and capacity building of Lien Son.

6. The town-level WWTPs will be managed by the company, which will operate the JICA-financed Vinh Yen WWTP. The operator of the JICA WWTP is in the process of selection by the PPC. There are two candidates under consideration by the PPC; one is the VYWSC and the other is Vinh Yen URENCO. Both companies expressed willingness to manage the town-level wastewater systems if they are selected as the operator of the Vinh Yen WWTP.

7. The VYWSC has 195 staff, including 32 professionals, 128 workers, and 35 contracted workers. The company provides 31,500 m^3 per day water supply to Vinh Yen City and the local towns, including 29,000 domestic households and industrial and commercial users. It has a board of directors, senior management (director and two deputies), seven departments, and local waterworks. The company charges VND 8,500 per m^3 for domestic users and 10 percent additional as the environmental fee, which is submitted to the provincial treasury for wastewater services. The company already has eight engineers working in the JICA-supported WWTP in Vinh Yen City and it is willing to manage the WWTP as part of the company's mandate and business as many cities in the country.

8. URENCO is responsible for solid waste management, drainage, electricity, landscaping, street lighting, funerals, and cemetery, and so on. It is a full government-funded company. From its VND 100 billion annual budget, the portion for drainage is 2.5 percent, a minor part of the company's portfolio. According to URENCO, there are 35 staff working on the drainage system in the city, including 4.5 km main drains, 36.4 km secondary drains, and 69.4 km tertiary drains. There is no pumping station in the drainage system. According to the company, 20 of its staff participated in the JICA WWTP project training and it is willing to manage the Vinh Yen City wastewater system, including the WWTP.

Financial Management, Disbursements, and Procurement

Financial Management

9. **Risks**. The inherent risk to the project FM is assessed as Substantial and the project control risk is assessed as Substantial after mitigation measures are taken, leading to overall FM risk being assessed as Substantial. The key risks identified at appraisal stage are the following: (a) newly established IA and inexperienced FM personnel may result in delay to project activities and disbursements or even misuse of funds; (b) inadequate oversight function by provincial government bodies will prevent early detection of irregularities and non-compliances; (c) unclear design of project activities and inadequate guidance may cause confusion to the PMO to implement and disburse, especially the cross-sectoral activities; (d) insufficient budget allocation for both ODA and counterpart fund to the IAs will cause delay to project implementation.

10. **The proposed action plan.** The following action plan has been agreed with the province to strength the FM capacity of the PMO.

Table 3.1. FM Action Plan

	Actions on Financial Management	Expected Date of Completion	Responsibility
1	Appointment of qualified experienced officers to be in charge of FM of the project	Completed	Vinh Phuc PPC
2	Operation manual, with detailed FM section, including oversight function of government bodies, approved by the PPC	Completed	PMO
		Completed	PPC
3	Adequacy of budget allocation for both ODA and counterparts	Completed	Vinh Phuc PPC
4	Package for financial audit included in Procurement Plan for the first year	Completed	PMO

11. **Implementation arrangements.** The FM system is designed in accordance with the project implementation arrangement of having a permanent PMO established under the PPC to manage the project and other donor-funded projects of Vinh Phuc Province. The finance and accounting division of the PMO, headed by a chief accountant, will play the key role on project FM, including (a) preparation of project annual financial statements and interim financial reports (IFRs); (b) recruitment of an external auditor for the project and submission of the annual audit reports to the Bank on time; (c) management of project designated account (DA) and approval of eligible expenditures; (d) contract management and payments; (e) maintenance of accounting

records and original supporting documents; and (e) working with auditors/inspectors appointed by the Government and the Bank.

12. **Interim financial reports.** The PMO, which is the ultimate spending unit, will prepare financial reports for all project expenditures incurred and submit them to the Bank within 45 days of the end of the semester. The IFRs, which are unaudited, will cover all project activities. The IFRs include the following forms:

- IFR1: Sources and Uses of Funds
- IFR2: Disbursement by Component and by Activities
- IFR3: Statements of Designated Accounts Reconciliation

13. **External audit.** Project financial statements will be prepared by the PMO for the whole project. The project's annual financial statements will be audited in accordance with international auditing standards and in compliance with the independent auditing regulations of Vietnam. The PMU will be responsible for the appointment of the auditor for the project in accordance with the Bank's guidelines.

14. **Governance and anticorruption.** To strengthen the FM arrangements for the project and to help reduce the risk of fraud and corruption, particular emphasis is needed in the following areas: (a) transparent criteria and procedures of approving subprojects, budget, and expenditures; (b) clear segregation of duties within the established PMO; (c) detailed and effective FM manual; (d) authorization by expenditures verification agencies (State Treasury) before payments, following the procedures in the country.

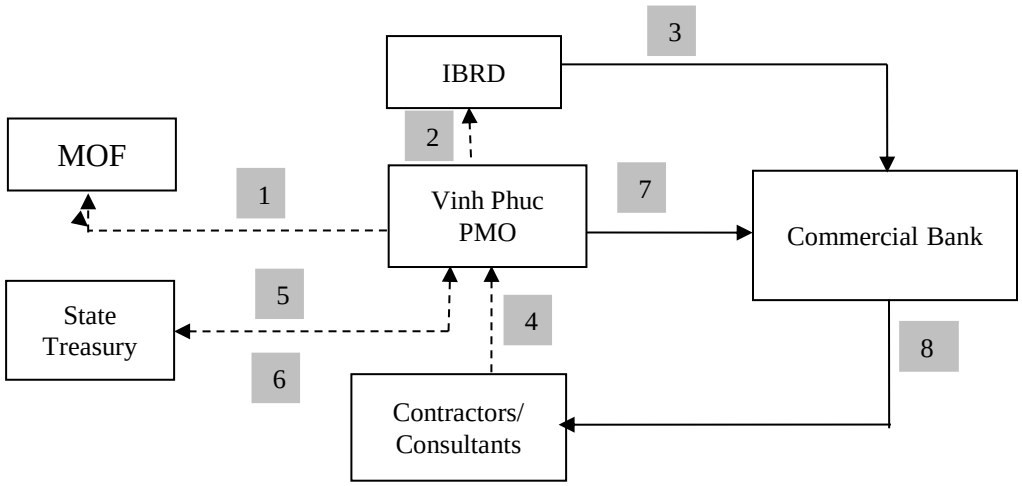
Disbursements

15. **Funds flow.** Funds flow will be channeled through a DA opened by the PMO at a commercial bank approved by the State Bank of Vietnam, exclusively for the purpose of project expenditures. Withdrawal applications will be prepared by the PMO and cosigned by the External Finance Bureau, MOF for recording and on-lending management. Ceiling of the account, frequency of withdrawal application, and details of supporting documents are provided in the project Disbursement Letter as part of the project negotiation package. The initial ceiling will be based on the forecast of expenditures for the next two quarters to be financed out of the funds in the DA. The primary disbursement method will be advances. Other methods are reimbursement, direct payment, and special commitment.

16. **Supporting documentation.** Documentation required for eligible expenditures paid from the DA are Statement of Expenditures and Records. The frequency for reporting eligible expenditures paid from the DA is quarterly (or more often if required). The reimbursement, special commitment, and direct payment disbursement methods will also be available. Reimbursements will also be documented using the Statement of Expenditures and Records. Direct payments will be documented by records. The minimum application size for reimbursement, special commitment, and direct payments will be US$100,000.

17. **Disbursement deadline date.** The project will have a disbursement deadline date (final date on which the Bank will accept applications for withdrawal from the recipient or documentation on the use of Loan proceeds already advanced by the Bank) four months after the closing date. This 'grace period' is granted to permit the orderly project completion and closure of the loan accounts through the submission of applications and supporting documentation for expenditures incurred on or before the closing date. Expenditures incurred between the closing date and the disbursement deadline date are not eligible for disbursement.

Figure 3.2. Disbursement Details



Note:

1. The Vinh Phuc PMO prepares the withdrawal application and sends it to the MoF-Debt Management and External Finance Department for cosignature.
2. The Vinh Phuc PMO submits the withdrawal application to IBRD.
3. IBRD disburses money to the DA of the Vinh Phuc PMO at the commercial bank.
4. Contractors/consultants submit claims for expenditure to the Vinh Phuc PMO.
5. The Vinh Phuc PMO reviews, certifies, and then submits the claim to the State Treasury for verification.
6. The State Treasury checks, approves, and sends it back to the Vinh Phuc PMO.
7. The Vinh Phuc PMO sends the request for payments to the commercial bank.
8. The commercial bank makes payment to the contractors/consultants.

18. The Bank loan will be disbursed against eligible expenditures inclusive of taxes as detailed in table 3.2

Table 3.2. Bank Loan Disbursements

Category	**Amount of the Loan Allocated (expressed in US$, millions)**	**Percentage of Expenditures to be Financed (inclusive of taxes)**
(1) Works for Components 1 and 2 of the project	91,324,000	85%
(2) Goods, Consultants' services, Non-consulting Services, and Training and Workshops under the project	49,221,000	100%

(3) Front-end fee	375,000	Amount payable pursuant to Section 2.03 of this Loan Agreement in accordance with Section 2.07(b) of the General Conditions
(4) Commitment charge	1,200,000	Amount payable pursuant to Section 2.04 of this Agreement in accordance with Section 2.07(c) of the General Conditions
(5) Interest on the Loan accrued on or before the last payment date immediately preceding the closing date	7,880,000	Amount payable pursuant to Section 2.05 of this Agreement in accordance with Section 2.07(c) of the General Conditions
(6) Interest rate cap or interest rate collar premium	0	Amount due pursuant to Section 2.08(c) of this Agreement
TOTAL AMOUNT	**150,000,000**	

Procurement

General Rules and Applicability

19. Procurement under the project will be carried out in accordance with the Bank's Procurement and Consultant Guidelines, as well as the specific provisions stipulated in the Loan Agreement (LA). The procedure to be followed for NCB shall be in accordance with provisions that are stipulated in the Annex to Schedule 2 of the LA (so-called NCB Annex). In case of any conflict between the LA and national laws/regulations, the LA shall prevail. For each contract to be financed by IBRD, the method of procurement or selection, cost estimate, prior review requirements, and time frame for implementation shall be agreed between the borrower and IBRD and duly reflected in the most updated project Procurement Plan.

Procurement Capacity and Risk Assessment

20. The capacity assessment of the IA was conducted by the Bank team in July and November 2015. The capacity assessment identified that procurement under the project may risk delays and noncompliance which could arise from the following:

(a) Lack of sufficient capacity, knowledge, and adequate experience by the PMO staff in properly handling procurement under Bank-funded projects and correctly applying the Bank’s procurement rules and procedures that will result in significant implementation delays and possible noncompliance with the guidelines.

(b) Lack of sufficient knowledge and experience by not only the PMO staff at implementing level but also by assigned staff at the Vinh Phuc PPC and its line agencies in charge of approving/appraising procurement decisions, that will cause delays in decision making. Potential delays may occur because of internal bureaucratic appraisal/approval procedures at the Vinh Phuc PPC and its relevant appraisal departments given heavy workloads from other projects.

(c) The IA (PMO/PMU) and relevant approving authorities (the Vinh Phuc PPC and its concerned departments) are less accustomed to the Bank’s Procurement Guidelines and tend to follow the local law, especially when it conflicts with the Bank's guidelines.. Given the current differences between the Vietnamese Law on

Procurement and the applicable Bank's Procurement Policies and Guidelines, the tendency of the PMO/PMU and appraisal authorities to follow the national procedures will also result in slow decision making, incorrect application of rules, and potential noncompliance with the Bank's Guidelines.

(d) Lack of sufficient capacity in procurement planning and contract management by the PMO, as well as provincial line agencies in charge of approvals that will undermine the timeliness and efficiency of contract implementation.

(e) Possible governance and corruption issues, including potential collusion among bidders.

(f) Delays in the procurement processing from procurement planning/packaging, preparation of technical specifications, and bid evaluation to contract award and signing. A special concern will be in procurement of high-value equipment for large pumping stations and specialized hydro-meteorological equipment for hydrological observation networks and SCADA systems. .

(g) Lack of counterpart funding on time and sufficient value for land acquisition of construction site and compensation that will also result in significant construction delays.

(h) Limited oversight by citizens, communities, civil society, and independent audit organizations.

21. The overall procurement risk for the proposed project is assessed as Substantial, given (a) the high risk inherent to the country's public procurement system; (b) the substantial risk in the water sector based on past performance under other Bank-financed projects; (c) the current capacity and experience of the IA and relevant provincial appraising authorities; and (d) identified risks associated with the project operational context, and from market research.

Procurement Risk Mitigation Measures

22. To mitigate the identified risks and build capacity, an action plan has been developed and agreed. The residual risk after the mitigation measures have been implemented and will remain Substantial.

Table 3.3. Mitigation Action Plan

	Actions	Responsibility	Time Frame (expected completion date)
1.	All staff of the PMO and concerned staff of provincial appraising authorities for the project to familiarize with and follow up with the Bank's Strategic Action Plan to address fraud and corruption in Vietnam. Establishment and monitored application of the Code of Ethics for project staff are mandatory requirements for compliance.	The PMO/Vinh Phuc PPC and concerned provincial departments	Throughout the project implementation
2.	Ensure procurement readiness of the project in the first 18 months for about 30% of the loan value (that is, readiness	PMO	Completed on March 30, 2016

	Actions	Responsibility	Time Frame (expected completion date)
	of technical design and corresponding bidding documents for civil work contracts, and Terms of Reference for large consulting assignments for to be procured in the first 18 months as being agreed in the project Procurement Plan).		
3	Appoint officers with adequate qualifications and procurement experience with Bank-funded projects to be in charge of procurement in the implementing unit to be established under the PMO (at least two procurement officers in the implementing unit).	PMO	Two qualified procurement officers mobilized on March 9, 2015
4	Prepare and enforce a hands-on procurement manual (covering clear rules, procedures and division of responsibilities, sample documents and evaluation report, procurement strategy and planning, and so on) as part of the POM. The use of sample bidding documents (harmonized among the Bank-Asian Development Bank-Vietnam) for NCB Works and Goods attached to the POM shall be mandatory. The use of the Bank's Standard Bidding Documents for ICB of goods shall also be mandatory.	PMO	The POM including procurement manuals cleared with the Bank on March 28, 2016
5	Provide regular and ad hoc trainings on the applicable Bank's procurement policies/procedures to project staff of the PMO/PMU, as well as other concerned staff of relevant provincial departments such as the Vinh Phuc PPC, who will be involved in assisting the PPC's appraisal for/approval of/ procurement decisions made by the PMO/PMU.	PMO and the Bank	By the project effectiveness which is expected to be in October 2016, at an early stage and throughout the project implementation
6	Mobilize adequate technical expertise (in-house and/or external consultants) to prepare technical specifications for (a) complex and large-value pumping equipment and (b) highly specialized hydrometeorological equipment for environmental monitoring and pollution controls and SCADA systems.	PMO	Throughout the project implementation
7	Vinh Phuc and the Bank facilitate the exchange of experience with other projects of similar nature in other provinces across Vietnam (Ho Chi Minh City, Binh Duong, and so on) for sharing/learning/replicating good practices.	Vinh Phuc PPC, the Bank	During the project implementation
8	Engage the internal and external auditor(s) to do procurement audits besides the technical and financial audits.	PMO	During project implementation

Procurement Strategy, Arrangements, and Planning

23. **A PPSD has been developed by the PMO.** The Procurement Strategy identified a fit-for-purpose procurement approach to suit specific needs, the market, and the operational context of the project. Given the project nature and complexity, the PPSD has followed a streamlined approach to be proportional, providing adequate justification for the selection methods chosen in the Procurement Plan.

24. According to the project scope and design, there will be no ICB package for construction works under Components 1 and 2 of the project, so all contracts for works will be procured under

the NCB procedure. In contrast, there will be large and complex ICB contracts for goods, such as (a) large-value equipment for three pumping stations under Component 1 and (b) complex and highly specialized hydrometeorological equipment under Component 3. There will also be large-value consulting contracts, such as for construction supervision in the first phase, for detailed design and preparation of bidding documents and construction supervision in the subsequent phases, which should follow the QCBS procedure.

25. The specific procurement methods, their application thresholds, and the thresholds for the Bank's prior review to be applied under the proposed project are indicated in table 3.3. During the project implementation, these thresholds may be subject to change upon the Bank's official notice in sufficient time in advance to ensure smooth implementation without any disruption.

Table 3.4. Summary of Procurement Arrangements

Expenditure Category	Contract Value (US$)	Procurement Method	Bank Prior Review (*)
Goods and non-consulting services	≥ US$3,000,000	ICB	All ICB contracts
	< US$3,000,000 (and contracts for goods that are not manufactured domestically)	NCB	First NCB contract in the project procurement plan agreed with the Bank
	< US$100,000	Shopping	None
	n.a.	Direct contracting	Justifications for all direct contracts shall be provided in the Procurement Plan for prior review
Works	>=US$20,000,000	ICB	All ICB contracts
	< US$20,000,000	NCB	• The first two NCB contracts in the project Procurement Plan agreed with the Bank • All other NCB contracts with cost estimates exceeding US$15,000,000
	< US$200,000	Shopping	None
	n.a.	Direct contracting	Justifications for all direct contracts shall be provided in the Procurement Plan for prior review
Consulting Services (***)	> US$500,000	QCBS: preferred method	• Firms: All QCBS contracts >= US$500,000 for firms; first contract for each method regardless of value; and • The first contract for each of the selection methods (QBS, FBS, CQS, LCS) regardless of value; and • All SSS contract • Individuals: only in exceptional cases for competitive selection. The same threshold applies for audit contracts
	≥ US$300,000	QCBS, QBS, FBS, LCS	
	< US$300,000	CQS	
	n.a.	SSS	

	n.a.	IC	

Note: FBS = Selection under a Fixed Budget; LCS = Least-Cost Selection; QBS = Quality-Based Selection; SSS = Single-Source Selection; CQS = Selection based on the Consultants' Qualifications.

26. **Procurement Plan.** An initial project Procurement Plan (dated March 29, 2016) has been agreed between the borrower and the Bank. The agreed Procurement Plan will be disclosed by the Bank to the public on the Bank website after the IBRD financing has been approved. The Procurement Plan will be updated on an annual basis or as needed throughout the project duration to reflect the actual project implementation needs and improvements in institutional capacity. The updated Procurement Plan, as agreed between the Bank and the borrower, will specify procurement methods and their applicable thresholds, as well as the most updated applicable thresholds for the Bank's prior review, for all packages.

Bank Implementation Support (through Procurement Supervision and Post review)

27. **Prior review.** The project Procurement Plan approved by the Vinh Phuc PPC and agreed with the Bank indicates the agreed prior review thresholds based on the procurement capacity assessment and mitigation measures. This will be updated annually or semiannually during implementation support missions, based on the integrated fiduciary assessment at supervision, and will be reflected in the updated Procurement Plan as appropriate. When the slice-and-package approach is followed, where bids are invited, evaluated, and awarded in the form of a package comprising multiple lots, the total estimated cost of all lots consisting of the particular package will be the basis to determine whether the package is subject to prior or post review.

28. **Supervision and post review.** Contracts not subject to prior review will be subject to ex post review by the Bank according to procedures set forth in paragraph 5 of Appendix 1 of the Procurement Guidelines and Consultant Guidelines. Such procurement ex post reviews by the Bank will cover 20 percent of the total post reviewed contracts and will be at a frequency of 12 months. The Bank will also carry out regular procurement supervision missions on a biannual basis. In addition to applicable prior review, the capacity assessment of the PMO has recommended annual supervision missions to visit the sites to carry out post review of procurement actions. On an annual basis and/or whenever required by the Bank, the PMO should consolidate procurement or contract data and send to the Bank a comprehensive list of all contracts for goods, works, and consultants' services awarded under the whole project that are subject to the Bank's post review, including but not limited to (a) reference number as indicated in the Procurement Plan and a brief description of the contract; (b) estimated cost; (c) procurement method; (d) timelines of the bidding process; (e) number of participated bidders; (f) names and reasons of rejected bidders; (g) date of contract award; (h) name of awarded supplier, contractor, or consultant; (i) final contract value; and (j) contractual implementation period.

Environmental and Social (including safeguards)

Social

29. **Applicable safeguards category and policies.** The project is classified as Category A, and Indigenous Peoples (OP/BP 4.10), Physical Cultural Resources (OP/BP 4.11), and Involuntary Resettlement (OP/BP 4.12) were triggered. In addition to the compliance of the Bank safeguard policies, the project also fulfils all Vietnamese-related legislation and norms.

30. **Social screening and impact assessment.** During project preparation, screening determined the safeguard instrument to be prepared. A summary of the SA findings included (a) confirmation that project's in situ intervention (rehabilitation of existing lakes/river/sluice gates) is not expected to involve significant and or irreversible social impacts; (b) identification of EM presence in the Binh Xuyen subproject; (c) verification of key stakeholders (institutional and local communities); (d) identification of institutional coordination required for the operational effectiveness of social matters; and (e) verification and analysis of gender issues and consideration project's gender mainstreaming.

31. **Indigenous Peoples (OP 4.10).** The presence of EM people was confirmed in the subproject area by the SA and consequently, OP 4.10 was triggered. The EMPF that was prepared was built upon the SA findings and prior informed consultation, which guided the EMDP's preparation for the first-year subproject, as will be done for those to be identified during project implementation. The Binh Xuyen subproject (dredging of river) is the only first-year subproject that could temporarily affect an estimated number of 20 EM households. The preparation of the EMDP confirmed broad support of EMs based on the information provided regarding the subproject's benefits and opportunities for the EM community. The EMDP reflects the EM's demands gathered in prior consultations and incorporated culturally appropriate activities to be supported, such as current EM farming and forestry practices. Before implementation, the EMDP for Bihn Xuyen will be further updated once detailed design is finalized and the impacts reconfirmed. In addition, the RAP for Binh Xuyen has been prepared to ensure that potential temporarily affected EMs will be compensated for in accordance with the project's RPF.

32. **Resettlement Policy Framework and Resettlement Action Plans.** The first-year subprojects will require land acquisition (permanent and temporary) to allow the rehabilitation of the existing lakes/rivers (dredging). These activities may affect crops, perennial trees, fishponds, and thus livelihoods of the households living in the project area and potentially some in the vicinity of the works. The magnitude of adverse impact as a result of land acquisition is anticipated to be minor and site specific, given the nature of rehabilitation. An RPF was developed to guide the RAPs for the subprojects to be prepared. The RPF includes a grievance redress mechanism. For subprojects to be implemented in the first year that involve land acquisition, three subprojects' RAPs were prepared before the project appraisal. According to the RAPs of the three first-year subprojects, an estimated 1,916 households will be permanently affected (agricultural land), of which 952 households (about half the total affected households) will lose more than 20 percent of their agricultural land. There is no physical relocation anticipated for the three first-year subprojects nor impacts to local business, which will be confirmed during project implementation when the detailed design is available. The estimated cost for land acquisition for the first three RAPs is US$13.5 million.

33. **Gender and other social impacts.** A GA was carried out as part of the SA, to examine gender-related issues so as to promote gender equality and enhance project's development effectiveness. A gender action plan and monitoring plan were developed on the basis of the GA, to enable gender mainstreaming for the identified subprojects during project implementation. For subprojects to be defined during project implementation, a GA, as part of the SA for the defined subproject, will be developed to inform the investment design and development interventions.

34. **Borrower's capacity on social safeguards.** The implementation of the RAPs and EMDP will be the responsibility of the Vinh Phuc PC. The costs for land acquisition (including costs to support livelihood restoration of affected households) will be financed by the Vinh Phuc PC whereas the budget for the EMDP implementation will be financed from the Bank's funds under the project. The Vinh Phuc PMO will be provided with the Bank's technical support for the RAPs and EMDP implementation and will be appointing a social specialist. An independent monitoring agency will be hired for periodic monitoring, to ensure social safeguards implementation is in full compliance with the Bank's policies.

35. **RAP/EMDP preparation, review, disclosure, and approval.** The Vinh Phuc PMO, responsible for the social screening and preparation of the RAP and EMDP, ensures the required consultation during preparation. The PMO revises the final RAP and EMDP drafts with field cross-checking and submits them for the Bank's clearance. During the review process, the PMU and the Bank could ask further detailed information and analysis. The RAP and EMDP of concerned subprojects, prepared during project implementation, will be disclosed locally before approval. The RAP and EMDP documents will be posted on the official website of the Vinh Phuc PMU and provincial level and hard copies will be available at the project site in Vietnamese. The English version of the RAP/EMDP will be disclosed at the InfoShop of the Bank.

36. **Bank's review and clearance.** The Bank will review and clear all the RAPs and EMDPs providing beforehand technical support to the Vinh Phuc PMU on safeguards requirements, if required. Training and capacity building will be provided to staff and consultants responsible for the implementation of social instruments for the first-year subprojects as well as for preparation of those for rest of the project cycle, to ensure accomplishment of the policies and local norms.

37. **Consultation and disclosure.** Safeguards documents' preparation was carried out on the basis of participation and consultation with the beneficiaries and affected. During project preparation, consultation and participation with locals were carried out through qualitative and quantitative methods (surveys, community meetings, and focus groups), including representatives from both project beneficiaries and adversely affected households. The survey covered 965 households (3,770 people); public consultation in 21 communes/wards (including 172 people); and community meetings (including 392 people). Feedback from consulted people provided key contributions to the preparation of policy frameworks (RPF and EMPF) and plans (RAP/EMDP/ Gender Action, Public Health, and Communication Plans). To ensure local people's engagement in new subprojects, at least 40 percent of affected households/beneficiaries will be consulted, considering their proposed mitigation measures in support of the livelihoods, and/or restoration, when required.

38. The RPF, EMPF, SA, three RAPs, and one EMDP (Binh Xuyen subproject) were disclosed on the Vinh Phuc DPI's website[4] on November 24, 2015, and locally at project communes on November 24, 2015. In addition, the abovementioned documents were disclosed in Vietnamese at the project site as well as the Vinh Phuc PMU's site in November 2015, and hard copies of the document have also been made available at the provincial-level DPI. The English version of these documents were also disclosed at the Bank's InfoShop on November 17, 2015 (RPF, EMPF); November 19, 2015 (three RAPs, one EMDP); and November 20, 2015 (SA).

Environmental

39. OP/BP 4.01 is triggered and the project is classified as Category A because of the potentially significant and irreversible environmental and social impacts associated with the flood control measures, in particular the dredging activities. As a Category A project, a full-scale ESIA is required according to the Bank's safeguard policies. The borrower was provided with the Bank Group Environmental Health and Safety Guidelines, which, with the sector-specific guidelines, provides guidance on best practice occupational and community health and safety procedures. The project triggers Environmental Assessment (OP 4.01), Natural Habitats (OP 4.04), Physical and Cultural Resources (OP 4.11), Safety of Dams (OP 4.37), and Projects on International Waterways (OP 7.50).

40. The project has numerous positive environmental and social impacts. It will reduce flooding in the Phan and Ca Lo River Basins (leading to opportunities for increased growing seasons and additional income for rural households); rehabilitate the ecological environment (upon project completion and during operation) through the establishment of regulation reservoirs; and strengthen and improve the capacity of existing wastewater management systems. Wastewater treatment undertaken under the project will lessen the pollutant load in the Phan River, which receives untreated domestic and (small) industrial waste discharge. The project also plans to include some capacity building on improved waste management and collection processes in the councils of villages and communes along the Phan River. The project area does not contain any national forests, nature reserves, ecologically sensitive areas, nor any endangered flora or fauna.

41. There are however, several key negative impacts. These are summarized below, along with proposed mitigation measures:

- **Risk of erosion and subsidence of the river and lake banks.** Mitigation measures include conducting geological and hydraulic surveys before construction

- **Localized flooding affecting local populations.** Construction sites are mostly located in areas adjacent to waterways or in agricultural areas (consisting of in-field irrigation canals). Therefore, the construction activities could have an impact on regional flow regimes and cause local flooding. Mitigation measures are proposed that before construction of each building, the contractor must perform the diversion measures to ensure the local flow and the construction location shall be well-fenced

[4] Website: http://sokhdt.vinhphuc.gov.vn/noidung/tintuc/Lists/ThoiSuTongHop/View_Detail.aspx?ItemID=87.

to prevent construction materials from entering into surrounding waters. The construction process shall be limited to the dry season. The PMU will ensure that detailed design will provide installation of temporary and permanent drainage to avoid potential flooding and disruption to the irrigation system in the project area during construction and operation.

- **The impact of the dredging process to water quality and aquatic life and downstream users includes the following:**
    - The dredging process will be carried out successively in sections, with the application of sheet piles surrounding each section to prevent the impact to other surrounding sections/areas.
    - Dredging activities shall only be carried out in the dry season.
    - Stream diversion will be carried out to ensure that the flow is not being disrupted
- **Construction of disposal sites.** The key impacts because of the construction of disposal sites include the dust, odor, and gases generated from dredged sludge; improper disposal of contaminated excavated materials to the designated disposal site; and land subsidence risk at the Dong Mong disposal site during construction. Mitigation measures include the following:
    - The disposal of waste at the disposal sites may generate dust; therefore, green trees will be planted around the site to minimize dust into the air. Regular spraying will take place. If the disposed sludge materials still generate odors and gases, spray daily with biological products and sprinkle with lime to prevent odor.
    - To prevent the soil erosion and land subsidence risk at Dong Mong disposal site, the site will be divided into 13 cells and material will be filled in successively in each cell. During the disposal process, the cell will be compacted carefully and soil embankment surrounding each cell to prevent soil erosion.

42. Cumulative impacts of the ongoing and proposed projects in the project area are positive, in that through the installation of WWTPs in both residential areas and industrial parks, the pollution load of untreated waste on the rivers are reduced. Moreover, several projects lead to improved flood control, which has economic and health and safety benefits to local communities. The existence of the dredge disposal sites and extrajudicial sand extracting activities in the project area does continue to place pressure on river water quality, and it is suggested that the Vinh Phuc authorities, in collaboration with DONRE, prepare a management plan to curb and control these activities, and restrict release of these materials into the river.

43. Although there will be changes in the hydrology of the Phan, Ca Lo, Pho Day, and Red Rivers, because of flood risk management measures, there will be no net abstraction of water from the rivers. With regard to water flow, it is estimated that a total of discharge flow of 115 m^3

per second will be pumped from the two pumping stations of Ngu Kien and Nguyen Duc to the Red River and 30 m^3 per second from Kim Xa pumping station to the Pho Day River. Water then flows to Pho Day River to Lo River and back to the Red River (17 km upstream of Ngu Kien pumping station discharging canal). Therefore, the water flow in the Red River will be increased by a total of 145 m^3 per second from the three pumping stations, which is insignificant compared to the maximum drainage capacity of 18,000 m^3 per second in the storm season. The Ca Lo River in the project area has an average river width of 20 m and depth of 1.7 m. There are no aquafarming activities in the river and around 22 households fish there during the off-season period. The hydrological analysis indicates that minimal ecological flow should be sustained, given the total volume of the river compared to the relatively small change in water flow. Moreover, according to the information provided from the Vinh Phuc DONRE and Department of Agriculture, there are no endangered fish species within the project area, nor there any migratory species located in the regulatory lakes.

44. In the project area, there are several graves that will need to be relocated from the Dong Mong disposal site. As the cemetery area was flooded during the survey period, it was not possible to ascertain the exact number of graves to be relocated. There is also a risk that project activities will have an impact on the Thien Phuc Church and the Great Banyan Tree (in Chua Village) in Van Xuan Commune. Given that the project involves large excavation activities, chance find procedures are detailed in the ESIA and will be incorporated into the bidding documents.

45. A detailed alternatives analysis was conducted, examining scenarios including a without project option and different technical options for the investment components of the project. In the absence of the proposed project, the development of residential areas and urban and industrial areas with associated ground clearance is likely to reduce the area of existing lowlands that in turn shrinks capacity to regulate regional water flow. The maximum flooding level is likely to lead to greater flooding for the project area. In the absence of the WWTPs, water pollution in the rivers will worsen. Alternatives were considered for the scale, capacity, and siting of pumping stations; siting of dredge disposal sites; types of drainage systems for rural areas; and technologies used for the WWTPs. Selections were made based on technical information: drainage capacity, controlled flood area, geographical conditions, and environmental and social impacts. In one instance, the Vinh Ninh disposal site was removed from consideration because its location and lack of elevation will affect the Red River flood drainage capacity.

46. The ESIA was disclosed in-country on December 20, 2015, and in the InfoShop on December 30, 2015. Two public consultations were carried out during the preparation of the project ESIA, the first on August 15, 2015, and the second on the December 30, 2015. In line with the government's consultation procedures the first consultation was conducted to collect opinions from the DPI, DONRE, DOC, DOT, DARD, and representatives from seven districts/city of Vinh Yen, Phuc Yen, Tam Duong, Tam Dao, Binh Xuyen, Yen Lac, and Vinh Tuong. Nearly 229 participants took part, including leaders of PCs of communes, wards, townships, community representatives, and leaders of hamlets/neighborhoods in 56 wards/communes/townships in the project area. All comments and concerns expressed during the consultation have been taken into account during the preparation of the project's feasibility

studies. The second consultation focused on the results of the impact assessment and the proposed mitigation measures.

47. **Dam safety.** The project does not involve the construction of any new dam. However, two large earth-fill dams, that is, the Xa Huong Dam (41 m high and total storage of 14.13 million m^3) and Thanh Lanh Dam (29 m high and total storage of 10.62 million m^3), are located upstream of project-supported structures in Basin C. As a result, Safety of Dams (OP/BP 4.37) is triggered. During the project preparation, Vinh Phuc Province engaged a dam safety review team led by a competent dam safety expert to conduct the dam safety review in 2015 and two dam safety assessment reports were prepared and submitted to Vinh Phuc Province in November 2015. Based on the information and conclusions of these two reports, the Xa Huong Dam was classified as an unsafe dam, which requires major remedial works (including dam body seepage control, upgrade of spillway, renovation of irrigation tunnel and its intake, and installation of instruments), and the Thanh Lanh Dam as a safe dam, which requires only minor remedial works (including installation of instruments and monitoring devices).

48. To ensure the safety of the Xa Huong Dam, Vinh Phuc Province continuously used the funds from various sources to implement remedial works, including two phases of the dam body seepage control fully completed in January 2016 and spillway expansion to be completed in April 2016. With the completion of these two major remedial works, the Xa Huong Dam will be upgraded to an acceptable safety level. To ensure the proper operation of the dams, Vinh Phuc decided to apply for the Bank support to completed all the outstanding remedial works, including the renovation of irrigation tunnel and its intake of the Xa Huong Dam, installation of instruments of both dams, as proposed by the dam safety review team under another Bank-supported project, that is, the Vietnam Dam Rehabilitation and Safety Improvement Project, which has been approved by the Board on December 15, 2015. The application had been submitted to the MARD on December 7, 2015.

49. In addition, to ensure the safety of the dams, proper Operational and Maintenance Manuals, including Reservoir Operational Rules and Emergency Preparedness Plans were required to be prepared and put in place for these two dams as immediate actions to be taken and Vinh Phuc has committed to engage the competent experts to do so. Vinh Phuc should also engage the dam safety specialist to conduct the annual dam safety review and such review will be reflected in the second semiannual project implementation report every year during the project implementation and reviewed by the Bank team.

50. **Institutional arrangements for social management.** The Vinh Phuc PPC (a) oversees RAP preparation and implementation; (b) guides the departments, district, and PC to ensure effective coordination between agencies; (c) establishes the Provincial Center for Land Fund Development as the unit fully responsible for the project resettlement implementation; and (d) approves the final SA/RAP/EMDP and designates a DPC to enable SA/RAP/EMDP implementation. The DOF appraises the compensation rate proposed by the relevant authorities based on results of independent land price appraisal and submitts to the PPC for approval in coordination with the relevant agencies (DONRE, DOT, Department of Industry, and DPC). The Vinh Phuc ODA PMO (a) oversees the project's technical, financial, accounting, resettlement, and other social activities and (b) appoints a team of social development specialists to implement the proposed social interventions, including M&E and training. The DPC (a) informs the

affected, according to the resettlements policies and social instruments prepared and (b) addresses and solves grievances related to compensation, assistancem and resettlement. The Ward People's Committee ***assists*** the Provincial Center for Land Fund Development with implementing the resettlement.

51. **Institutional arrangements for environmental management.** The Vinh Phuc PMO will hire the services of a local environment and social firm to support the supervision of the implementation of the ESIA. In addition, an independent third-party monitor will be engaged by the PMO to carry out regular, independent M&E of subproject Environmental and Social Management Plans (ESMPs), to ensure implementation compliance. Training and capacity building to staff and consultants responsible for the implementation of environmental management and monitoring will be provided throughout the project cycle.

52. **Projects on International Waterways.** The project triggers OP 7.50 as the interventions in Component 1 will affect the Red River, an international waterway originating in China. In project Component 1, two of the three proposed pumping stations, one with capacity of 80 m^3 per second and the other 35 m^3 per second, will be built for flood control purpose. They will discharge water to the Red River. The Red River is considered as an international waterway to which the Bank's OP 7.50 - Projects on International Waterways applies. OP 7.50 requires that a notification of such projects be made to all riparian states, in this instance to China. At the request of the Government of Vietnam, the Bank has undertaken such notification to China in accordance with paragraph 4 of OP 7.50.

Monitoring and Evaluation

53. The PMO will submit progress reports in an agreed format to the Bank biannually. The progress reports will cover, among others, the expected completion date for civil works and goods contracts (both physical and financial progress); progress and expected completion date for key consultancies; compliance toward environment and social safeguards, including implementation of key features of the environmental management plan (EMP) and RAPs; progress on institutional components; progress toward indicators specified in the Results Framework; training and studies; and activities of the PMO consultants. The reports will also cover detailed financial and procurement information, including (a) a comparison of actual physical and financial outputs with forecasts and updated six-month project forecasts; (b) project financial statements, including application of funds, expenditures by category statement, and DA reconciliation statement; and (c) a procurement management report showing status and contract commitments. A midterm review of the project will be undertaken by December 31, 2018. An Implementation Completion and Results Report will be submitted to the Bank no later than six months after the closing date.

ANNEX 4: IMPLEMENTATION SUPPORT PLAN

SOCIALIST REPUBLIC OF VIETNAM: Vinh Phuc Flood Risk and Water Management Project

1. A project launch workshop will be organized as part of the first supervision mission shortly after project effectiveness. During implementation, the Bank will field semiannual supervision missions throughout the project life. Based on the implementation schedule, a midterm review mission will be fielded in 2019, with the actual date and duration depending on the progress in implementation. The approach for the implementation support plan was built on the experience gained from the previous Bank operations in the country and globally with the reality of Vinh Phuc Province's project implementation capacity. It has also been developed based on the nature of the project and its risk profile.

Implementation Support Plan

2. **Technical.** Hydraulic engineering, flood risk management, irrigation, water, and sanitation communications, and other related expertise will be required during implementation, including review of bidding documents and technical proposals, providing technical and engineering advice, and site visits for quality inspections to ensure smooth progress of the construction and implementation.

3. **Fiduciary.** Training will be provided by the Bank's FM and procurement specialists during project implementation. The team will also help the PMO identify capacity-building needs to strengthen the FM capacity and improve procurement management efficiency. Both the FM and procurement specialists will be based in the country office to provide timely and continuous support. Formal FM and procurement supervision will be carried out semiannually as part of the overall project supervision.

4. **Safeguards.** The Bank's supervision team includes an environmental specialist and a social safeguard specialist. The Bank team will supervise implementation of the social and environmental management instruments and provide guidance to the PMO to address any issues. In addition, the Bank team will provide guidance to the independent monitoring consultants and review their reports so as to minimize the potential social and environmental risks.

Table 4.1. Expertise Needed and Time Allocation

Skill Required	Time Needed (annual staff weeks)	Trips	Comments
Task team leader	12	2	Team Mixed of Bank's HQ and Cost
Co-task team leader	8	2	-
Hydraulic engineer	6	2	-
Water and sanitation specialist	6	2	-
Flood risk and water resource management	4	2	-
Irrigation specialist	4	2	-
Procurement specialist	8	2	-
FM specialist	4	2	-
Environmental specialist	4	2	-

Social specialist	4	2	-
Monitoring and evaluation specialist	2	1	-

ANNEX 5: ECONOMIC ANALYSIS

SOCIALIST REPUBLIC OF VIETNAM: Vinh Phuc Flood Risk and Water Management Project

Background

1. Vinh Phuc Province has experienced rapid economic growth and transformation for over two decades. At the provincial level all economic indicators are impressive. The growth rate and per capita GDP are above the national average. The per capita GDP in 2012 was higher than the national average by 44.4 percent and the poverty rate was as low as 7.3 percent (the corresponding national average is 11.3 percent). The major contributing factor to this favorable economic situation was growth in the industry and construction sector because of the FDI. Almost half of the provincial GDP comes from the FDI sector. Currently the province attracts annually about US$200–350 million in FDI. Over time, the share of industry and service sector in the provincial economy has substantially increased while that of agriculture, forestry, and fishery that sustains the poorer section of the population has conspicuously declined. Vinh Phuc had a population of about 1 million in 2013, of which 22.4 percent and 77.6 percent lived in the urban and rural areas, respectively. About 60 percent of the population earned their livelihoods from agriculture, forestry, and aquaculture, which are highly vulnerable to the flood hazards.

2. At the provincial level, the aggregated economic figures mask important differences in socioeconomic status among the people of the province. According to a recent SA survey, about 82.1 percent of the households in the project area earn VND 5 million per month or less (equivalent to US$224). On a per-capita basis, the average income is about VND 1.14 million per month (equivalent to US$51) (or VND 13.68 million per year (equivalent to US$613), which is only about 26.3 percent of the reported provincial average of VND 52 million (equivalent to US$2331). The income distribution among the sample households from the project area is as follows: (a) 3.3 percent of the sample households obtain less than VND 1 million per month (equivalent to US$45)and are considered poor and vulnerable; (b) 42.9 percent of the sample households earn between VND 1 million (equivalent to US$45) and VND 3 million a month (equivalent to US$135); (c) 35.9 percent receive between VND 3 million (equivalent to US$135) to 5 million a month (equivalent to US$224); and (d) 17.9 percent obtain more than VND 5 million a month (equivalent to US$224). Therefore, assuming an average household size of 4 and considering the revised poverty line of US$1.9 per capita per day, a substantial proportion of the sample households from the project area are considered to be poor. Despite the favorable economic indicators at the provincial level, a significant segment of the population, particularly in the rural communities, is facing economic challenges, further compounded by high exposure to flood hazards and general environmental pollution.

3. The flood hazard impinges on the sustainability of the overall provincial economy as two-thirds of the province is prone to flooding. Initial estimates of the flood damage during the period 2006–2013 is about US$150 million. Flood hazard and water environment pollution problems are major challenges not only to the sustainable growth of the provincial economy but also to the livelihoods of vulnerable population in rural areas and small towns. The proposed project is a timely response to these priority challenges facing the province. The key value proposition of the Bank’s engagement relates to supporting the province to have an integrated

response to the current water resources problems. The Bank's engagement will leverage the ongoing endeavors by the Vietnamese government and other DPs and helps the client to draw on international experience and best practice relating to flood management, water quality management, and integrated river basin management in the rapidly urbanizing environment.

Methodology

4. The project has three interlinked but distinct subcomponents. However, a composite cost-benefit analysis was done taking the project as a whole and, to the extent possible, identifying quantifiable benefits and costs.

Costs

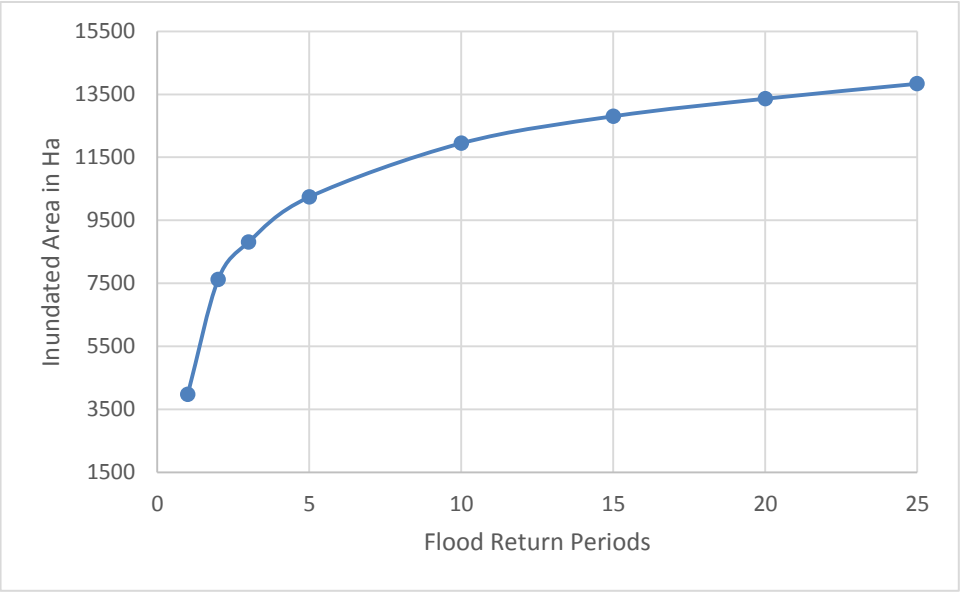
5. The total project cost was estimated at US$220 million including counterpart contribution of about 32 percent (US$70 million). The project cost breakdown is as follows: (a) US$107 million for construction and consulting services, (b) US$38 million for equipment, (c) US$32 million for site clearance, (d) US$21 million for project preparation consultancy services, management, and others, and (e) US$22 million for contingencies. The annual O&M cost is estimated at 4 percent of the total investment costs. These financial costs where converted to economic costs using appropriate conversion factors by first dissociating the cost items into skilled labor, unskilled labor, tradable goods and services, nontradable goods and services, energy, taxes, price contingencies, and physical contingencies. The conversion factors were determined to be 0.916 and 0.909 for investment and O&M costs, respectively.

Benefits

6. The methodology for assessing the benefits of flood alleviation combines an assessment of the hazard, with regard to the probability of future floods to be averted, and a vulnerability assessment with regard to the damage that will be caused by those floods and therefore the economic saving to be gained by their reduction. Estimation of damage or loss probability curve is a major step in any flood mitigation benefit estimation exercise. In the present case this was achieved through the following steps:

- **Step 1.** Establishing the relationship between different flood events and the inundation area. This data was obtained from the hydrological analysis report provided by consultants and is depicted in figure 5.1 for the whole project area.

Figure 5.1. The



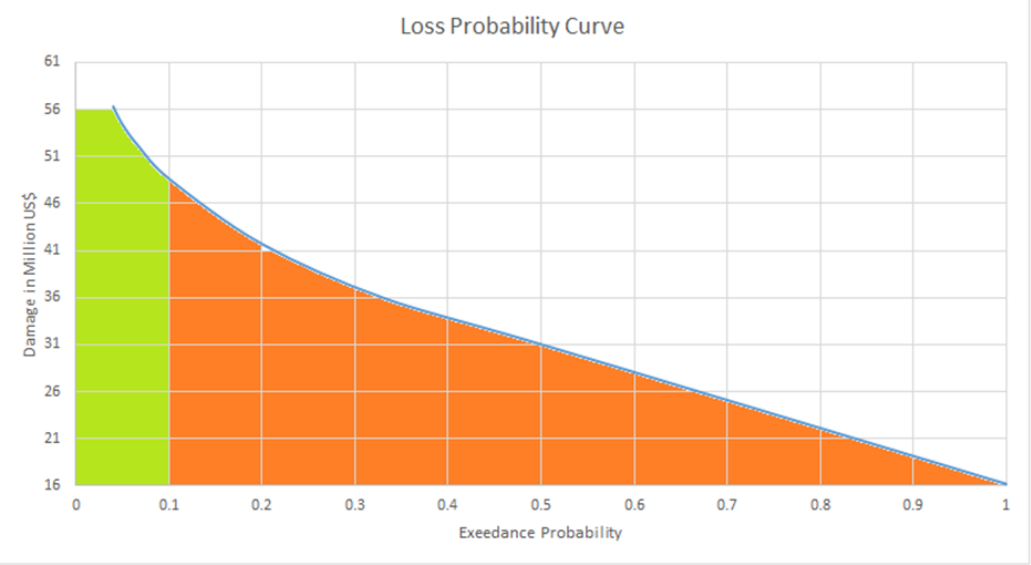
Relationship between Flood Return Period and Inundation Area

Source: adapted from Vinh Phuc Flood Risk and Water Management Project, Hydraulic Model Report Prepared by Vinh Phuc Provincial ODA Management Board

- **Step 2.** Determination of the land-use pattern of the inundated area, the economic sectors affected, and the extent of possible damage. The extent of damage for the key identified economic activities was obtained from actual losses documented by Vietnamese ministries for the recent past flood events (that is, 2006, 2008, 2011, 2012, and 2013). These damage costs were divided by the reported inundated area to obtain damage cost per unit area. The items considered in damage loss estimation were agriculture, industrial zones, flood disaster prevention and recovery, environmental management, infrastructures, sanitation, tourism, and loss of property values. These items were used to estimate damage cost for the successive exceedance probabilities or flood return periods.

- **Step 3.** Determination of the loss probability curve as shown in figure 5.2.

Figure 5.2. The Loss Probability Curve



Source: Calculated based on data from Hydraulic Survey Report and Financial and Economic Analysis Report by Vinh Phuc Provincial ODA Management Board consultants

7. The total Annual Average Damage (AAD) cost is the area under the curve in figure 5.2. However, the averted damage cost is a subset of this total, the magnitude of which is determined by the adopted design standard. In the present case the adopted design standard is chosen to be the flood return period of one in ten years with an exceedance probability of 10 percent.

Different methods can be used to calculate the area under the loss probability curve.[5] Here the numerical integration method has been adopted, which is based on the Trapezoidal Rule.

8. The AAD cost without the project is calculated to be about US$38.3 million (the area shaded green and the area shaded orange). This damage is reduced to just only US$3.1 million (the area shaded green) because of project implementation. Thus, the annual damage cost avoided because of the project is about US$35.2 million per year (the green shaded area in figure 5.2).The project therefore may not protect wholly against rare floods above return periods more than one in ten years. This leaves residual flooding after the scheme has been implemented. A flood risk early warning system, which is also part of the current project, may play an important role in reducing the damage because of the residual flooding. In this analysis, the benefit of a flood early warning system is estimated to be about 10 percent of the estimated residual annual flood damage or with the project expected annual damage (the green shaded area). Given that the early warning systems have the biggest impact in reducing loss of life and injury, it is possible that the economic value of the early warning system is underestimated.

9. Component 2 of the project provides wastewater and drainage services in densely populated small towns and rural communities. The total population expected to benefit from these services are about 150,000 people. Three types of benefits are expected to be derived from the wastewater and drainage services. These are (a) reductions in household health care cost, which is estimated to be US$37.6 per capita per year; (b) avoided preventive expenditure, which is about US$16.4 per capita per year; and (c) avoided income loss because of morbidity of household members, which is estimated to be US$17.9 per capita per year. Thus, the total benefits of wastewater and drainage services is conservatively estimated to be US$71.85 per capita per year.

10. Key assumptions:

- Assumed discount rate is 5 percent.
- Service of the project is assumed to be 30 years.
- Conversion factor for investment costs was assumed to be 0.919.
- Conversion factor for O&M costs was assumed to be 0.909.

Results of the Economic Analysis

11. The results of the economic analysis are summarized in table 5.1. The NPV is in the order of US$246.3 million with an associated internal rate of return of about 16.44 percent assuming a 6 percent discount rate. This result indicates that the project is economically viable.

12. The sensitivity of the economic analysis results to discount rate and service life of the project assumptions was assessed and the results are summarized in table 5.2. The results indicate that the NPV is very sensitive to both discount rate and project service life assumptions.

[5] According to Olsen et al. 2015 (Comparing Methods of Calculating Expected Annual Damage in Urban Pluvial Flood Risk Assessments), the choice of method by which the AAD is calculated appears to be of minor importance.

Table 5.1. Summary of the Results of the Economic Analysis

No.	Item	Costs or Benefits (US$, millions)
A	**Benefits**	
A.1	Present Value of Averted AAD Costs: Structural Interventions	335.80
A.2	Present Value of Averted AAD Costs: Flood Early Warning System	2.99
A.3	Present Value of Environmental Management Benefits	102.95
A.4	Present Value of Total Benefits (A.1 + A.2+A.3)	441.75
B	**Costs**	
B.1	Present Value of Investment Costs	151.10
B.2	Present Value of O&M costs	44.35
B.3	Present Value of Total Costs (B.1 + B.2)	195.45
C	**Net Present Value (A.4 - B.3)**	246.30
D	**Internal Rate of Return (IRR %)**	16.44
	B/C Ratio	2.26

Table 5.2. Sensitivity of the Project Economic Indicators to Some Key Assumptions

Service Life in Years	Discount Rate Assumptions			
	6%		10%	
	NPV (US$, millions)	IRR (%)	NPV (US$, millions)	IRR (%)
30	246.3	16.44	246.3	16.44
40	299.1	16.66	299.1	16.66
50	328.6	16.71	328.6	16.71

Results of Financial Analysis

13. The project is found to be economically viable (that is, from the overall Vietnamese society point of view). However, the analysis of the financial performance of the project indicates that the financial net present value is negative VND -4.62 million) [6] because of lack of substantial direct revenues from the project-generated goods and services[7] and the high capital expenditure involved. This is not surprising as the outcome of the project is mainly flood protection, which has a public good nature. Thus, the debt service and O&M costs resulting from the project intervention need to be largely borne by the provincial and state governments. The Bank has been providing technical assistance to align debt management practices in Vietnam to international sound practice. The central government is steadily making progress in this area. Generally, the provincial governments have the authority to borrow but are not required to produce a debt management strategy. However, the current draft of government decree on management of ODA Loans and government's Concessional Loans to the PCs of provinces includes a guidance for provinces to establish a specialized unit within the DOF to manage debt, including on-lending loans.

[6] US$ 1 = VND 21,890.

[7] Financial and Economic Analysis Report by IPWEVN Consulting Consortium, November 2015. (IPWEVN is a six firm consortium, including the Institute of Water Resources Planning (IWRP), Vietnam Water, Sanitation and Environment Joint Stock Company (VIWASE), the Institute for Pumps and Water Resources Machine (IPM), the Development and Investment Consultant for Construction of Infrastructure (DICCI), Vinh Phuc Agriculture and Rural Development Investment Consultant Joint Stock Company (TVNNVP), and Vinh Phuc Construction Planning Institute (QH XDVP).

Analysis of Fiscal Impact of the Project on the Province

14. There is a need to undertake an analysis of the debt portfolio of Vinh Phuc Province to monitor the maturity of the profiles of loans and ensure that the principal on outstanding loans are spread out evenly or uniformly to mitigate liquidity and cash flow risks. The flood risk management component of the project, which constitutes the bulk of the capital and O&M costs, is not expected to generate revenues by way of direct service charges (table 5.3). However, the provincial government may get substantial revenues from taxes on businesses and services that may develop because of reduction of flood risks and the general improvement in environmental quality.

Table 5.3. Estimated O&M Expenditure of the Project (Million VND)

Items	Year		
	2021 to 2030	2031 to 2040	2041 to 2045
Flood management works	1,605,026	2,874,357	2,201,471
Wastewater collection and treatment systems	189,289.3	338,988	259,631
Revenues from sewage fee	96,144	201,146	172,894
Percent of sewage fee to O&M expenditures for wastewater treatment systems	50.8	59.0	67.0

15. Vinh Phuc Province is already one of the net contributors to the state budget in the country. Its current level of public debt is insignificant. The average value borrowed by the Vinh Phuc provincial government is only about 1 percent of the local revenues. Table 5.4 shows that the project is not expected to negatively affect the fiscal sustainability or the debt service capacity of the government. The debt service as percentage of the provincial expenditure is lower than 1.5 percent and declines over time. In this analysis, the provincial expenditure was projected based on the actual expenditure pattern over the period 2011–2015.[8] While the debt service was calculated based on conditions of the IBRD loan from the Bank.

Table 5.4. Forecasted Revenues and Expenditure of Vinh Phuc Province (2021–2045)

Items	Years		
	2021–2030	2031–2040	2041–2045
Projected state expenditure(VND, millions)	240,722,350	475,429,847	390,371,308
Debt service (principal plus interest plus fees) VND, millions	3,638,069	3,460,322	576,960
Debt service as percent of total expenditure	1.5	1	0.15

Financial Performance of Companies Responsible for O&M

16. The O&M of flood protection infrastructure is expected to be handled by the wholly state owned irrigation companies, mainly through regular budget allocation from the government. An assessment of the financial performance of the irrigation company (Lien Son Irrigation Company) showed that the company was in a good financial condition indicating that the government has fulfilled its budget allocation responsibilities. Going forward, the financial sustainability of irrigation companies relies on continued government commitment. The O&M routines of the wastewater collection and treatment infrastructure may be handled either by water supply or environment and urban sanitation companies. The water companies are joint stock with

[8] 2014 Statistical Year Book of Vinh Phuc Province.

about 89 percent of the total shareholding capital belonging to the government, while the latter are autonomous companies. The financial performance of these companies, namely Vinh Phuc Water Company No. 1 and Vinh Yen Environment and Urban Sanitation were assessed for the years 2012 to 2014 (table 5.5). The results show that the companies actually made some profits. These companies' budgets largely depend on water and environmental fees collected from beneficiaries thus their financial sustainability depends on fees collection from the beneficiaries.

Table 5.5. Financial Performance of Companies Responsible for O&M (VND, billions)

	2012	2013	2014	January to September 2015
Lien Son Irrigation Company (% State share = 100%)				
Assets	n.a.	670	709	831
Debt	n.a.	65.4	42	40.5
Equity	n.a.	604	667	790.8
Revenue	n.a.	102.1	112	n.a.
Profit	n.a.	1.38	1.43	n.a.
Vinh Phuc Water No. 1 (% State share = 89%)				
Assets	186	183	177	n.a.
Debt	84.2	74.1	80.3	n.a.
Equity	101.8	108.9	96.7	n.a.
Revenue	56.4	66.3	72.7	n.a.
Profit	2.4	0.33	0.31	n.a.
Vinh Yen Environment and Urban Sanitation (% State share = 0%)				
Assets	129	171	164	n.a.
Debt	18	33	22.7	n.a.
Equity	111	138	141	n.a.
Revenue	104	123	104	–
Profit	0.95	1	1.26	–

Affordability Issues: The Sewage Fee

17. Currently the sewage tariff is pegged to water charge, constituting about 8 percent of the water charge.[9] The current sewage fee ranges between VND 600 and 1,120 per m^3 of discharge. The water charge depends on the type of user and the quantities of use as depicted in table 5.6.

Table 5.6. Current Average Sewage Fee in the Vinh Phuc Province

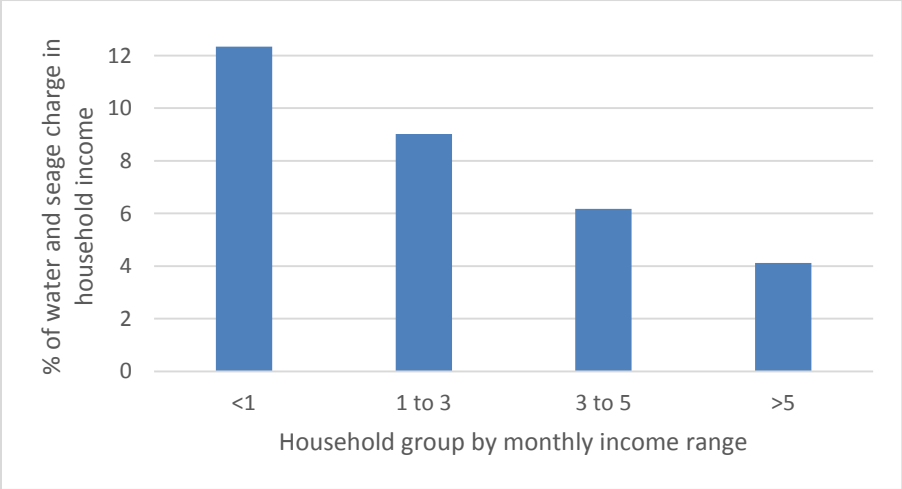
Water Users	Monthly Water Use (m^3)	Water Charge (VND/m^3)	Sewage Fee (VND/m^3)
Households	<10	7,500	600
	10–20	9,500	760
	>20	11,000	880
Average		9,000	720
Public institutions	Based on actual use	11,000	880
Production processes	Based on actual use	12,500	1,000
Services and business	Based on actual use	14,000	1,120

[9] According to Decision No.109/2013/NQ-HDND dated December 20, 2013 of the PC of Vinh Phuc Province.

18. Unit sewage O&M cost is calculated considering the legal basis of calculating price of drainage and wastewater treatment in Vietnam. The analysis indicates that the unit cost of management, operation, and maintenance of wastewater treatment systems is about VND 3,342 per m^3. This unit cost if applied completely meets the costs of management, operation, and maintenance required to sustain the planned wastewater treatment systems. The calculated unit cost is very high when compared to the ongoing rates. It is about five times higher than the average for households and about three times higher than the highest charge, which is paid by businesses and services (see table 5.5). The conclusion is that unless the tariff is revised upwards several fold, the service provider cannot even cover its O&M costs.

19. According to the approved urban drainage planning, the provincial standard for water supply is 130 liters per person per day, which is equivalent to 3.9 m^3 per person per month. According to the SA report, the average size of a household in the project area is 3.75 people. Thus, an average household consumes about 14.625 m^3 of water. If an average household is charged the full O&M cost, the total monthly expense for sewage service will be VND 48,876.75 per month. About 3 percent of households in the project area earn a VND 1 million or less a month. For this group of households the share of the sewage charge in the monthly household income is about 4.9 percent. The share of the combined monthly water and sewage charge in the household income is about 18 percent, which is considered very high and therefore unaffordable. However, for households who earn above VND 3 million per month, the share declines to less than 6 percent and is therefore moderately affordable (figure 5.3). Households in this income category account for about 54 percent of the population of the project area.

Figure 5.3. Share of Water and Sewage Charge (at Full O&M Cost Recovery) in the Monthly Household Income



Source: Adapted from Vinh Phuc Flood Risk and Water Management Project: Social Assessment Report

ANNEX 6: PROJECT MAP

SOCIALIST REPUBLIC OF VIETNAM: Vinh Phuc Flood Risk and Water Management Project