

**PROJECT INFORMATION DOCUMENT (PID)  
APPRAISAL STAGE**

Report No.: PIDA28117

<b>Project Name</b>	Vietnam Dam Rehabilitation and Safety Improvement Project (P152309)
<b>Region</b>	EAST ASIA AND PACIFIC
<b>Country</b>	Vietnam
<b>Sector(s)</b>	Irrigation and drainage (35%), Energy efficiency in Heat and Power (30%), Water supply (30%), Public administration- Water, sanitation and flood protection (5%)
<b>Theme(s)</b>	Natural disaster management (35%), Water resource management (30%), Rural services and infrastructure (25%), Infrastructure services for private sector development (10%)
<b>Lending Instrument</b>	Investment Project Financing
<b>Project ID</b>	P152309
<b>Borrower(s)</b>	Vietnam Ministry of Agriculture and Rural Development
<b>Implementing Agency</b>	Central Project Office
<b>Environmental Category</b>	A-Full Assessment
<b>Date PID Prepared/Updated</b>	12-Aug-2015
<b>Date PID Approved/Disclosed</b>	12-Aug-2015
<b>Estimated Date of Appraisal Completion</b>	11-Aug-2015
<b>Estimated Date of Board Approval</b>	29-Sep-2015
<b>Appraisal Review Decision (from Decision Note)</b>	

**I. Project Context**  
**Country Context**

1. Vietnam has experienced a rapid economic growth over the past two decades. Political and economic reforms launched in 1986 have transformed Vietnam from one of the poorest countries in the world, with per capita income below US\$100, to a lower-middle income country within a quarter of a century, per capita income reaching US\$1,790 by the end of 2014. The poverty headcount ratio has fallen from 58 percent in 1993 to 17.2 percent in 2013, and most indicators of welfare have improved. Vietnam has been applauded for the equity of its development, which ranks better compared with other countries in similar context. Five of the ten original Millennium Development Goal targets have already been attained.

2. Vietnam is an agriculture-based economy and a country most exposed to natural hazards. These risks pose a challenge for Vietnam's quest for continued growth, given the geography,

topography, economic structure and population distribution making the country highly vulnerable. While floods and typhoons are the dominant hazards, the country is also susceptible to droughts, landslides and seawater intrusion, particularly during the monsoon rainy season combined with river plain flooding and flash floods, as well as associated land-slides. The risks associated with these hazards are being further exacerbated due to the impacts of climate change. Recent experience has illustrated the increasing financial vulnerability from extreme weather events, accentuated by the density of physical and commercial activities in vulnerable areas. The agriculture sector is particularly vulnerable to climate risk and is being heavily dependent on irrigation, drainage and flood control with a high density infrastructure network distributed across 14 major river basins throughout the country.

3. Significant resources have been invested in ensuring water security. Water-related expenditures accounted for an estimated 22.9 percent (US\$ 1,140.57 million) of total Government expenditure during the period of 2001 to 2011. Over half of the Government expenditures were channeled into hydroelectric power plants (50.6 percent), followed by water supply and sanitation (27.8 percent) and agricultural water resources (17.3 percent). During this same period, official development assistance (ODA) gross disbursements in the sector on average amounted to US\$ 240.52 million per year, with close to half of ODA disbursements going to water supply and sanitation (46.8 percent). As a result of these investments, Vietnam has one of the world's most extensive network of dams and hydraulic infrastructure with a combined storage capacity of about 50 billion cubic meters, similar to that of France, Germany and Australia. While the primary development has been for irrigation and hydropower, many of these dams are multi-purpose, supporting flood regulation, aquaculture and bulk of water supply. While these investments have provided an effective infrastructure platform to ensure water security and meet historical demands, increasing impacts associated with a changing climate, the frequency of natural disasters and increased demand resulting from rapid economic development are undermining the existing dams and hydraulic infrastructure and accentuating uncoordinated operational procedures.

4. With over 7,000 dams of different types and sizes Vietnam has a complex and evolving institutional framework for dam safety. There are more than 750 large dams, with the number of small dams estimated to be in excess of 6,000. These are largely earth embankment dams supporting irrigation of more than three million of the total four million hectares of agricultural land. These irrigation dams fall under the Ministry of Agriculture and Rural Development (MARD) and are managed through the Provincial structures, with the exception of one inter-provincial dam managed at the central level. At the provincial level all large and medium-size dams are managed by provincial Irrigation Management Companies (IMCs) while small dams are entrusted by IMC to local communities for operations and maintenance. In addition, there are more than 1,100 hydropower dams either under operation, construction, investigation or planned that fall under the Ministry of Industry and Trade (MoIT). The existing 268 hydropower dams have a total installed capacity of 13,066 MW. Of these, 86 are defined as large hydropower dams, with an installed capacity greater than 30 MW, managed through Electricity of Vietnam (EVN), the state owned power utility, or other state-owned hydropower companies. In contrast, most of the small hydropower facilities (<30MW) are developed, owned and operated by the private sector.

Table 1: Summary of the Dam network in Vietnam

Definition	Irrigation	Hydro-power
Dams > 50m		3
Dams 15m – 50m or >=3 MCM	551	54

5. The development of this extensive network of hydraulic infrastructure has resulted in a number of inherent challenges. Many of the medium and small-size reservoirs were built in the 1960s-1980s with limited technical investigations, inadequate design, and poor construction quality. These issues have been compounded by limited investments in operations and deferred maintenance, as the public sector irrigation dams are financed through Government transfers which are often insufficient and untimely. As a result, many dams have deteriorated, posing a substantial risk to human safety and economic security, with structural and non-structural safety often falling below acceptable international standards. The deterioration of these dams, coupled with increased risk and uncertainty resulting from hydrological variability due to climate change and rapid upstream development, has placed many reservoirs at risk.

6. Failure to secure the operational safety of the existing hydraulic networks and strengthening the capacity for further development has the potential to undermine Vietnam's economic gains. The cost of damages associated with water-related disasters have been estimated at VDN 18,700 billion (US\$ 1.25 billion) between 1995 and 2002. In the past five years, there have been an estimated 30 dam failures. These have resulted in devastating regional flooding, significant loss of human life, and substantial economic losses. The impacts associated with natural flooding have been further exacerbated by the uncoordinated operation along cascades of dams within individual river basins and the limited capacity for timely monitoring and forecasting of high flows, particularly in the narrow and steep topography of the Central Highlands. The public outcry resulting from recurrent flooding and dam failure has been echoed by the media and has led to civil society campaigns which have raised the awareness of this problem in all spheres of Government.

7. The Government has established a sectoral program for dam safety in recognition of the importance of securing the foundations for sustained and secure economic growth. The program was first launched in 2003, revised again in 2009 and has been revisited in 2015 as part of the effort to revitalize the program activities and targets. Based on information available from MARD, there are about 1,150 irrigation dams in need of urgent rehabilitation or upgrading until 2022. By contrast, the physical conditions of the large hydropower dams under the operation of the national utility are reported as safe. The program recognizes the need to improve not only the physical stability of dam facilities, but also the safety management system including the legal and regulatory framework, technical standards, norms, guidelines, manuals as well as building capacity. The program is currently being led by MARD in collaboration with the MoIT, the Ministry of Natural Resources and Environment (MoNRE) and Provincial authorities with budget support from the national Government. The total cost of the program is estimated to be over VND21.3 trillion (approx. US\$1.0 billion). In support of this renewed effort, the Government has allocated an amount of VND900 billion (approximately US\$38 million) since 2013 to rehabilitate about 90 dams. The number of dams rehabilitated annually is about 50, with an average cost of US\$400,000. While sufficient technical capacity exists to rehabilitate a large number of dams, the current program is constrained by resource availability.

### **Sectoral and institutional Context**

8. Vietnam's legislation governing the water sector consists of a complex system of legal instruments issued by different state agencies. The institutional responsibilities are divided between MARD, which is responsible for publicly financed irrigation dams while MoIT oversees the

hydropower facilities. The Law on Water Resources approved in 2012 and became effective on January 2013 assigns MoNRE within the evolving institutional framework with responsibility for inter-reservoir operations in those basins with cascades of dams. The Law is aligned with principles of Integrated Water Resources Management (IWRM), with an emphasis on the introduction of river basin approaches, including provisions for improving dam safety and reservoirs, as well as introducing provision for the introduction of environmental flows. The national legal framework for dam safety is prescribed through Decree No. 72, issued in May 2007 and revised to define a set of dam safety related issues. However, oversight of dam operations and performance by central ministries and provincial authorities is constrained by lack of capacity, both in terms of number and skilled qualifications, further undermined by the lack of technical standards, norms, safety inspection guidelines and procedures. The roles and responsibilities of the various Government agencies are outlined in a series of Government Circulars. These were formulated and came into effect to direct dam safety and reservoir management and include provisions for inter-reservoir water regulation plans covering serious drought, water contamination, environmental incidents, or disasters. The decrees and circulars also define the roles and responsibilities of provincial and district level organizations and other relevant entities.

9. The rapid development of hydraulic infrastructure is increasing the institutional complexity within various river basins. This evolving context requires similar changes in the regulatory regime to clearly delineate responsibilities and provide the mechanisms to balance the competing demands of the different state agencies. The operation and maintenance (O&M) of medium and large-size irrigation dams is the responsibility of the provincial irrigation management companies (IMCs) with branch offices at district level. The O&M of small dams is typically the responsibility of the local authorities acting through its Agricultural Cooperatives or irrigation brigades. While the technical capacity of the IMCs is generally good and sufficient to meet the minimum management responsibilities, the capacity of the local authorities is limited, necessitating significant support and guidance from technical agencies at the provincial and district level. In contrast, the responsibility for the O&M of hydropower dams rests with its owners, although often without regular monitoring by administrative agencies. The state-owned corporations responsible for O&M of the large and medium-size hydropower dams have sufficient technical expertise to perform their tasks. However, the private-sector investors developing the smaller hydropower dams often lack the technical expertise to manage these facilities. This poses a number of safety risks, especially during the flood season. Strengthening the institutional arrangement to ensure more effective dam safety and reservoir management is a core Government objective that will be supported by the project.

10. There are estimated to be at least 104 different entities responsible for managing irrigation and drainage systems across Vietnam. These include 90 Provincial IMCs under PPCs in 49 of the country's 63 provinces employing over 24,000 staff. The IMCs are state owned enterprises responsible for operations and maintenance for irrigation facilities including dams at the provincial level with branch offices at the district level Irrigation Management Enterprises (IMEs). In addition, there are three MARD IMCs in charge of large inter-provincial irrigation schemes that operate across 11 provinces. In the remaining 14 provinces where there are no IMCs, irrigation and drainage systems are managed by a range of different institutions, including Irrigation Management Centers, Irrigation Management Boards, Water Resources Division of the Provincial Departments of Agriculture and Rural Development (DARDs). These 14 provinces are mainly in the Mekong Delta where irrigation schemes do not rely on reservoir storage. Typically, responsibility for reservoirs less than 1MCM in the lowland areas and 500,000m<sup>3</sup> in the highlands are delegated to the District or Commune level. The DARDs are responsible for overseeing the O&M, monitoring

performance and regulation of irrigation at the provincial level under the guidance of the PPCs.

11. The Provincial People's Committees (PPC) are responsible for guiding and monitoring the operation of dams and reservoirs, and the execution of safety plans during disaster events. The O&M of the dams, along with emergency preparedness procedures and overall dam safety measures are prescribed in the Provincial Flood Prevention and Protection Plans. These are the responsibility of the PPC in accordance with the provisions of Decree No. 72. These plans are compiled and carried out in coordination with MARD, MoNRE, and MoIT, along with the Steering Committees for Natural Disaster Prevention and Control, which is led by the Minister MARD. Insufficient funds and delays in the release of the annual budgets for O&M implies that such plans are not fully implemented, resulting in the deterioration of many dams. This is particularly problematic for small dams managed by the local communities. Lack of safety monitoring devices, unclear reporting procedures and the absence of a robust institutional framework for coordination further undermine dam safety operations and expose many downstream communities and economic activities to significant risks.

## II. Proposed Development Objectives

The Project Development Objective is to improve the safety of dams under the Government's Dam Safety Program to protect downstream communities and economic activities through priority investments and institutional enhancements.

## III. Project Description

### Component Name

1. Dam Safety Rehabilitation

### Comments (optional)

### Component Name

2. Dam Safety Management

### Comments (optional)

### Component Name

3. Project Management Support

### Comments (optional)

## IV. Financing (*in USD Million*)

Total Project Cost:	455.00	Total Bank Financing:	420.00
Financing Gap:	0.00		
<b>For Loans/Credits/Others</b>			<b>Amount</b>
BORROWER/RECIPIENT			35.00
International Development Association (IDA)			420.00
Total			455.00

## V. Implementation

## VI. Safeguard Policies (including public consultation)

<b>Safeguard Policies Triggered by the Project</b>	<b>Yes</b>	<b>No</b>
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

**Comments (optional)**

## VII. Contact point

### **World Bank**

Contact: Cuong Hung Pham  
 Title: Sr Water Resources Spec.  
 Tel: 5777+7308 /  
 Email: cphamhung@worldbank.org

Contact: Marcus J. Wishart  
 Title: Sr Water Resources Spec.  
 Tel: 5369+3147  
 Email: mwishart@worldbank.org

### **Borrower/Client/Recipient**

Name: Vietnam Ministry of Agriculture and Rural Development  
 Contact: Mr. Tran Kim Long  
 Title: Gen. Director of ICD  
 Tel: 84-913218121  
 Email: longtk.htqt@mard.gov.vn

### **Implementing Agencies**

Name: Central Project Office  
 Contact: Mr. Nguyen Canh Tinh  
 Title: Project Director  
 Tel: 84-913218121  
 Email: nctinhcpo@gmail.com

**VIII. For more information contact:**

The InfoShop  
The World Bank  
1818 H Street, NW  
Washington, D.C. 20433  
Telephone: (202) 458-4500  
Fax: (202) 522-1500  
Web: <http://www.worldbank.org/infoshop>