

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

Report No.: AB4043

<b>Project Name</b>	Jakarta Urgent Flood Mitigation Project
<b>Region</b>	EAST ASIA AND PACIFIC
<b>Sector</b>	Infrastructure
<b>Project ID</b>	P111034
<b>Borrower(s)</b>	GOVERNMENT OF INDONESIA
<b>Implementing Agency</b>	Directorate General of Water Resources, MPW Directorate General of Human Settlements, MPW Provincial Government of DKI Jakarta
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**1. Key development issues and rationale for Bank involvement**

1.1 Greater Jakarta is the political and economic center of Indonesia. With an estimated population of over 24 million, it accounts for a quarter of the nation's non-oil GDP. The city, with a population of about 9 million, is administered by the Provincial Government of Jakarta (*Daerah Khusus Ibukota* or DKI). DKI lies in the delta of the Ciliwung River and about 40% of its area is below sea level (see Annex 1). Every year, large parts of the city are flooded during the rainy season, which starts in November and ends in April. Floods were especially severe in February 2002 and February 2007, when 60% of Jakarta was inundated with floods, up to seven meters deep, causing over 70 deaths and displacing 340,000 of its inhabitants<sup>1</sup>. The floods cause massive outbreak of dengue fever and diarrhea. Bappenas estimated the financial losses from the 2007 flood at US\$900 million dollars<sup>2</sup>; the economic costs are significantly higher, which includes loss of human life, health costs, labor and school days lost. The recent February 2008 floods caused 30 deaths and shut down Jakarta's Soekarno-Hatta international airport for three days.

1.2 The city's floodways and drains are designed to offer a level of protection of 25 years; that is, Jakarta is suppose to on average flood once every 25 years if its flood control system would function as designed (see Annex 2). For many reasons, the actual capacity of the flood control system is significantly lower than original design capacity (see Annex 3):

- **Population pressures.** During 1980-2005, the population of Greater Jakarta doubled from 11.9 million to 23.7 million. Every year, an estimated 250,000 people join the rural-urban migration to Jakarta. Population pressures converted half the city's small lakes (*waduk*) into residential or

<sup>1</sup> *Emergency Situation Report #6*, World Health Organization, 19 February 2007.

<sup>2</sup> *Flood Management in Jakarta: Causes and Mitigation* (World Bank, February 2007).

commercial areas, leading to severe reductions in retention capacity and increases in peak discharge. DKI's flood control systems are also adversely affected by weak enforcement of spatial plans and building regulations and uncontrolled abstraction of groundwater.

- Insufficient maintenance and improper operation of flood control systems. The Ministry of Public Works (MoPW) and DKI are required to maintain flood control infrastructure, but actual budgetary allocations are substantially lower than what is needed to maintain the system<sup>3</sup>. This has resulted in huge sediment build-up in floodways and drains, reducing protection levels from 25 years to less than five years.
- Limited coverage of solid waste collection services. The rapid population increase was accompanied by a corresponding increase in solid waste. DKI presently collects less than 40% of its solid waste generated, where 15% of Jakarta's total solid waste (about 1,000 tons) is discarded into the city's canals<sup>4</sup>. Waste water discharge into the canals exacerbates water quality and contributes to water-borne diseases.
- Lack of coordination between authorities responsible for flood management. MoPW and DKI are responsible for managing Jakarta's flood control system. MoPW is responsible for floodways that cross provincial boundaries; while the Public Works Department of Jakarta (*Dinas Pekerjaan Umum* or DPU-DKI) is responsible for drains and retention basins within its boundaries. Since the 1990s, DKI has assumed *de facto* responsibility for maintaining floodways under MoPW, as MoPW do not adequately allocate financial resources to maintain floodways under its jurisdiction.

1.3 Rationale for Bank Involvement: In the aftermath of the 2002 flood, the World Bank financed a series of studies to examine flood management and mitigation measures. (i) Pusat 3-10<sup>5</sup> recommends interventions to improve urban drainage and *waduk* management in Greater Jakarta and contains a program for urgent maintenance dredging.; (ii) DKI 3-8<sup>6</sup> contains recommendations for improvements to drains and retention basins under the legal responsibility of DKI, including measures to improve the institutional and regulatory setup of the city's flood control system; and (iii) DKI 3-9<sup>7</sup> provides detailed engineering designs for the drains and canals in 26 locations and preliminary engineering design for 52 locations, including detailed reports, tender documents, and engineering drawings for drains and canals (see Annex 4). Using these studies, JEDI identified high priority drains and canals that require urgent dredging. Moreover, computer simulations of the 2007 floods, created by Delft Hydraulics of the Netherlands confirmed that dredging Jakarta's canals and floodways to its original design capacity would greatly mitigate future floods (see Annex 5).

1.4 During the height of the 2007 floods, the Governor of DKI requested the Bank's assistance for flood mitigation in Jakarta. At that time, the level of support for the canal dredging project was minimal at MoPW and other central ministries (Bappenas, MoF). In an unprecedented step, the Governor expressed his willingness to use part of the Bank loan to finance the rehabilitation of floodways under the authority of MoPW. Still, a desire to work for a common goal between central and local authorities to address these issues was missing. Three events are largely responsible for changing central government agencies' views. First, the Delft Hydraulics simulation models presented a powerful visual image of the 2007 and 2008 floods. The simulations clearly show that dredging greatly mitigates the floods and had a major impact in rallying policy makers to a common purpose. Second, the February 2008 floods, with the

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<sup>3</sup> that DKI would need at least IDR 87 billion per year to maintain the flood control system under its authority. In 2002, actual expenditures were about IDR 7 billion (Rijkswaterstaat et. al., 2003).

<sup>4</sup> TEMPO estimates 30% of solid waste generation (2,000 tons per day) is dumped in rivers (19 Feb 2007).

<sup>5</sup> *Outline Plan for Major Drainage and Small Lakes Management in Jabodetabek-Bopunjur Area*, WJEMP Pusat 3-10, Nippon Koei and Kwarsa Hexagon, June 2005.

<sup>6</sup> *Drainage Management for Jakarta: Priority Assistance*, WJEMP DKI 3-8, Louis Berger Inc. and PT. Indah Karya (Persero), April 2004.

<sup>7</sup> *Drainage Management for Jakarta: Strategic Action Program Development*, WJEMP DKI 3-9, NEDECO, Netherlands Engineering Consultant, October 2005.

flooding of the airport toll road flooded that reflected badly on MoPW, created a sense of urgency that made all parties believe now was the time to act. And finally, Vice President Kalla personally intervened and ordered MoPW to dredge the major canals in close proximity to Soekarno-Hatta international airport as a matter of 'national importance'. Public cries for action, and support from DPR (national parliament) and DKI DPRD (local parliament) contributed to this process. The Bank held intense discussions with DKI and MoPW and with Bappenas and MoF to advance project preparation. At present, political commitment to this project – from submission in the 'Blue Book', to defining the project scope of work, to agreeing to on-lending arrangements – is strong, with all parties agreeing on roles and responsibilities to ensure the delivery of the JEDI project (see Annex 6).

1.5 More importantly, all parties agree that JEDI will be the first in a series of projects intended to address Jakarta's flooding. The emergency dredging of major canals and floodways, i.e. the scope of work for the proposed JEDI project, will be followed by additional floodway improving measures – connecting the West and East Banjir Canals and linking the Ciliwung and Cipinang rivers – as well as support to DKI in dredging micro canals. JEDI represents the tip of the iceberg in terms of follow-up actions/projects needed to mitigate the floods. While JEDI is designed as an emergency response to restore the capacity of Jakarta's canals and floodways, additional flood mitigation measures, including solid waste and waste water management, will be important going forward. In addition, integrated water resources management (including sea water defense) and measures to improve both the quality and quantity of bulk water to Jakarta will be crucial. Discussions on the many follow up projects to JEDI are on-going, and a formal request for Bank support in all these areas will be sent by the Governor of DKI Jakarta (see Annex 7).

## **2. Proposed project development objective(s)**

2.1 The objectives of the Jakarta Emergency Dredging Initiative (JEDI) are to:

- alleviate the impacts of annual floods in DKI through the priority rehabilitation and dredging of existing floodways, drains and retention basins, in accordance with international best practices; and
- provide technical expertise through on-the-job training to strengthen the capacity of DKI and MoPW to operate and maintain its flood control system, in accordance with international standards.

2.2 The project is intended to reduce the economic and social cost of flooding by partially restoring the capacity of the city's flood control system to its original design level. It is expected that the project would benefit the poorer segments of the population, who live in the flood-prone areas and are most vulnerable to the immediate impacts of flooding including loss of income, medical costs, as well as the costs of infrastructure, business and home repairs. The emergency nature of the Bank's response presents an opportunity to capture a window of national, political unity to address a problem that, every year, affects millions of urban dwellers.

## **3. Preliminary project description**

3.1 The proposed JEDI project consists of three components: (A) urgent dredging, rehabilitation of embankment and pump repairs; (B) construction of a disposal site for dredge spoil; and (C) capacity building and project implementation support (see Annex 8). The total project cost is about US\$150.5 million (see Annex 9). The Bank will seek bilateral grants for the capacity building and implementation support component.

3.2 The scope of works for the emergency dredging include floodways, canals and drains under the responsibility of (i) Directorate General of Human Settlements, MoPW (DGCK - Cipta Karya); (ii) Directorate General of Water Resources, MoPW (DGWR); and (iii) DKI Jakarta. All the selected drains, floodways and retention basins are located in flood prone areas in North Jakarta. DGWR will act as the

Executing Agency (PMU), while DGCK, DGWR, and DKI will each operate a PIU. The project is expected to commence in 2009, for three years to 2011, while the capacity building component will be implemented until 2012.

**3.3 Component A: Urgent Maintenance Dredging, Rehabilitation of River Embankment and Pump Repairs (~USD 82 million).** Previous studies have identified a series of floodways, drains and retention basins (including screens and pumping stations) that are in urgent need of rehabilitation, and when restored to original design capacity would bring immediate benefit to persons living in the flood-prone areas. The emergency dredging and rehabilitation measures are intended to allow DPU-DKI to manage and operate the city's flood control system in a sustainable manner. MoPW, jointly with DKI, has assigned highest priority for maintenance dredging to: (i) four drains of national importance; (ii) four floodways under DGWR authority; and (iii) five major drains; and (iv) five *waduks* (retention basins) under DKI.

3.4 Longitudinal profiles of four major floodways (Cakung Floodway, Sunter River, Cengkareng Floodway and West Banjir Canal), undertaken in 2004, indicate high levels of sediment. In addition, some embankment stretches need rehabilitation to restore their crest levels to their original design water level. The embankment stretches that require rehabilitation are: (i) upstream stretch of the Cengkareng Floodway (Upper Angke) - estimated 6 km; (ii) downstream stretch of the West Banjir Canal (Lower WBC) - estimated 4 km; (iii) West Banjir Canal upstream Mokervaart - estimated 3 km; and (iv) downstream stretch of the Cakung Drain (Lower Cakung Drain) - estimated 10 km. A rapid survey is planned in mid-2008 to define the scope of work for this component in detail.

**3.5 Component B: Construction of Dredge Spoil Disposal Site (~USD 68.5 million).** The total dredging volume required to rehabilitate the selected drains and basins to their original capacity is about 9.4 million m<sup>3</sup> (of which 3.5 million m<sup>3</sup> of dredge spoil is from floodways under the authority of MoPW). According to the Pusat 3-10 Report, sediments of the main drains and rivers contain heavy metals, but are non-hazardous and suitable for landfill and sea disposal. A rapid survey is needed to include sediment analysis, including sieve analysis to determine the characteristic of the sediment in order to be able to decide on the dredging methodology, required equipment, and design of the disposal site (e.g. a combination of garbage and sludge disposal). As DKI does not have waste disposal sites with significant spare capacity, the creation of a facility to store hazardous sludge in a sealed area is being considered. Initially, this would require 115 Ha of a Class 3 landfill site, to be extended to 250 Ha in a later stage (the present identified sludge disposal site is about 77 Ha).

3.6 The selection of the disposal site has important economic implications to the project. Land values and transportation costs will be considered in the selection of the site. A disposal site outside Jakarta may be more economical given the high land values in the city, however, transportation costs, including time and impact on urban environment and traffic, need to be weighed in the selection process. The cost of the disposal site is currently split between DKI and MoPW based on the volume of sludge generated from each source. It is expected that DKI will manage and operate the site using modern waste disposal standards.

**3.7 Component C: Capacity Building (~USD 9 million).** Component C is divided among three main activities in order to assist in the preparation, implementation of the JEDI and beyond. The three main activities are: (i) Technical assistance for project preparation and advisory support; (ii) Comprehensive flood mitigation support; and, (iii) Non-structural measures and coordination of donor activities. The initial focus will include the development of a framework for proper environmental management and social safeguards (see Annex 10), assistance in procurement and financial management, and project monitoring and reporting. A project management unit (PMU) from DGWR will ensure preparation is in accordance with Bank guidelines. Assistance will involve preparation of consultant packages and technical support for developing bidding documents for dredging works contracts, disposal site works, as well as other TA support.

3.8 This component is designed to assist DKI and MoPW in acquiring the necessary capacity and technical expertise to rehabilitate and maintain its flood control system beyond the lifetime of the project. Component C will support pilot projects for improving micro-drains to complement the major dredging activities. Another pilot project will focus on issues surrounding resettlements and developing a framework for land acquisition. Non-structural measures for flood mitigation will also be a major focus of Component C, including: (i) *prevention and mitigation*, e.g., watershed/land use management.; (ii) *responses* to flooding, e.g., early warning systems, evacuation and health services; and, (iii) *recovery*, e.g. rehabilitation, compensation, and post-evaluation (see Annex 11).

**4. Safeguard policies that might apply: Emergency Procedures (OP/BP 8.00)**

4.1 The team proposes application of the new OP/BP 8.00: Rapid response to Crisis and Emergencies for the processing of the proposed JEDI project. The objective using OP/BP 8.00 instead of regular procedures is to enable the project to quickly yield benefits starting before the rainy season of 2009 and minimize the negative impact of the floods for that year.

4.2 The proposed JEDI project meets the objectives of the OP/BP 8.00 in that it anticipates the preservation of human, social and institutional capital; assists in building capacity for long term flood management and risk reduction; and supports measures to mitigate the potential effects of imminent floods in a high risk and high social and economic value environment.

4.3 The main elements and benefits of OP8.00 as it relates to the project would be: (a) once the PCN/PID is approved, the team will dedicate full effort to field work and government discussions until the negotiations package is ready for Bank review; (b) use of simplified procurement assessment and bidding procedures; (c) use of simplified financial management assessment; and (d) use of simplified Environmental and Social Screening Assessment Framework that would provide guidance during implementation.

1. Tentative financing

Source:		(\$m.)
Borrower		15.05
International Bank for Reconstruction and Development		135.45
	Total	150.5

2. Contact point

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