資料4

各国における上下水道事業

Water and sewerage works in each country

PPP Council for Overseas Water Infrastructure

Sewerage Infrastructure in Cambodia

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> Toshi-Kaikan, Tokyo, Japan 14 February, 2011

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Background

▲ South-East of Asia- North connected by the Loas, the East to the Vietnam, the South-by the Golf Sea of Thai and the West- by the Thailand.

▲Land Area 181.035 sq Kms .

Population : 13,388,910 (Population Cencus 2008)

▲ The main religion is Buddhism.

Capitalcity : Phnom Penh

▲ *Total Number of Provinces and Municipality: 24*

▲ Total Number of Districts: 185

▲ Total Number of Comunes: 1621

▲ Total Number of Villages: 14,073

▲ Urban Population: 2,614,440 (19.5%)

Annual Growth Rate: 1.54%

Average Size of Household: 4.7



Pipeline Project



- Kampot Wastewater Treatment System: MPWT was conducting the FS and projecting to finish at the end of 2011.
- Environmental Master Plan: MOE was conducting the study (Water Supply, Wastewater, Solid Waste & Air Quality) to cover Siem Reap, Phnom Penh & Sihanoukville Towns in 2010.
- Water and Sanitation Sector Financing Strategy for Cambodia: WB was conducting the study & projecting to finalize in 2010.
- Coastal Sustainable Development: MLMUPC and related institution to develop the Coastal Master Plan Development Study including the water and sewerage infrastructure in 2010.
- Phnom Penh Sewage Treatment Plant: MOE & MPWT were conducting the FS and going to finish in 2011.
- Towns Development Project: ADB is going to conduct the FS in 2011 and the loan is projecting in 2013.

Law and Regulation

Water quality standard in public water areas for bio-diversity conservation in Cambodia

No.	Parameters	Unit	Standard value		
River					
1	рН		6.5-8.5		
2	BOD ₅	mg/l	1-10		
3	Suspended Solid	mg/l	25-100		
4	Dissolved Oxygen	mg/l	2-7.5		
5	Coliform	MPN/100ml	<5000		
Lakes	s and Reservoirs				
1	рН		6.5-8.5		
2	COD	mg/l	1-8		
3	Suspended Solid	mg/l	1-15		
4	Dissolved Oxygen	mg/l	2-7.5		
5	Coliform	MPN/100ml	<1000		
6	Total Nitrogen	mg/l	0.1-0.6		
7	Total Phosphorus	mg/l	0.005-0.05		
Coast	tal water				
1	рН		7-8.3		
2	COD	mg/l	2-8		
3	Dissolved Oxygen	mg/l	2-7.5		
4	Coliform	MPN/100ml	<1000		
5	Oil content	mg/l	0		
6	Total Nitrogen	mg/l	0.2-1		
7	Total Phosphorus	mg/l	0.02-0.09		

Source: Annex 4, Sub-Decree on Water Pollution Control, 1999

Design Data for Wastewater Treatment Plant

Influent

- Total BOD load: 1,838 kg/d
- Ambient Temperature : 24° C
- Waste Stabilization Pond System
- Anaerobic Ponds, Sludge Disposal
- Facultative Ponds
- Maturation Ponds
- BOD Removal Rate: 95%
- Coliform Removal Rate : 99%
- Effluent
- BOD load : 368 kg/d; 0.07 mg/l

Siem Reap Sewerage System & Improvement of Siem Reap River





Siem Reap lies within the large, flat plain lying between the Kulen mountains to the North-east and Tonle Sap to the South.

- Centre Economy of Tourism.
- ▲Land Area :12,150 sq.Kms
- Population : 782 809 persons (Municipal Siem Reap)
- └ **→** Town City : Siem Reap-Angkor
- ▲ Total Number of District: 12
- ▲ Total Number of Comunes: 100
- ▲ Total Number of Villages: 875

Siem Reap Sewerage System & Improvement of Siem Reap River

Storm Drainage

• Length is increased by about $L \doteq 2.0$ km, Route of storm drainage is changed.

F/S	This Project		
<u>Total : L=6.07km</u>	<u>Total : L= 8.2km</u>		
- West1: L=2.45km	- West1: L=3.3km		
- West2: L=2.24km	- West 2 : L=2.6km		
- East : L=1.38km	- East : L=2.3km		

Improvement of Siem Reap River

In combinations with under construction by Apsara

Authorities

F/S	This Project		
<u>Total : L=4.0km</u>	Total : L=4.0km		
Dragon Bridge ~	New Bridge at former Tourism Department		
Crocodile Farm : L=4.0km	~ Dragon Bridge: L=1.6km		
	Dragon Roundabout ~		
	New Ring Road Bridge : L=2.4km		
Replacement of floodgate : 1EA	Same as left		



Waste Stabilization Pond System



Problem and Constraint

- The present situation of sewerage and drainage is alarming and requires urgent intervention to address the issues;
- A further deterioration is expected through rapid town development
- At present, there is no sewerage and drainage sector master plan for the towns or country,
- Not adequate human resources, empowerment and financial resources for O&M and management of the sewer system;

Necessary Countermeasure

- Establishment of legislation and laws for wastewater management institutions for the empowerment/ enforcement, Capacity building and resources mobilization.
- Master plan for Sewerage and Drainage system of each urban area and towns throughout the country is urgently required;
- Encouragement of Private Sector Participation.

Thank You



The Second Meeting of "PPP Council for Overseas Water Infrastructure"

PROMOTING PPP IN WATER INFRASTRUCTURE, SOLID WASTE, AND WASTE WATER MANAGEMENT IN INDONESIA



Presented by:

Budi Yuwono Director General of Human Settlements, Ministry of Public Works, Republic of Indonesia

Tokyo, February 14, 2011

I. Water Supply

1. Water Supply Problems

- Level of services of drinking water in Indonesia in average (in urban and rural areas) is only 47.7%.
- The total population in Indonesia is 237 million people, and about 54% of the total population are living in urban areas. The need for drinking water is high.
- The limited bulk water provision which is caused by inappropriate water sources management and the impact of global climate change. Environmental degradation and pollution of bulk water sources are also serious problems which make water treatment needs a huge investments.



2. MDGs Target and Budget needed

- The target MDGs is to increase the level of service to 68.8%.
- The total budget needed to increase the level of services of drinking water is approximately US\$ 4.6 billion.
- The Government budget to achieve that target is only about US\$ 1.18 billion. Therefore, there is as much as US\$ 3.42 billion budget needed from other sources besides the government budget.



3. Strategic Plan 2010-2014 for Water Infrastructure

- The target for developing the IKK/district level water system from year 2010 to year 2014 is 820 locations/districts.
- The target for developing rural water supply system from year 2010 to year 2014 is 4,650 villages.



4. Water Infrastructure Potential Projects for PPP

- Umbulan water supply project in East Java with the capacity of 4.000 lt/second and the estimated investment is US\$ 0.2 billion.
- Jatiluhur water supply project in West Java with the capacity of 5.000 lt/second and the estimated investment is US\$ 0.19 billion.
- Bandar Lampung water supply project in Sumatera with the capacity of 500 lt/second and the estimated investment is US\$ 36.6 million.



5. Supporting for PPP Projects

- Presidential Regulation number 13 year 2010 as revision of Presidential Regulation number 67 year 2005 regarding Partnership of Government and Private Sector.
- Establishment the Supporting Agency for Drinking Water Development System (which is called BPPSPAM) to facilitate PPP in water infrastructure



II.Solid Waste Management

1. Problems of Solid Waste

- Rapid increase of a waste generated, particularly in domestic waste. Currently, the increase rate of the waste generated from domestic waste is about 2-4% per year.
- Inefficiency in solid waste management, limited capacity of budget, and low level of services.
- Methane gas are releasing to the air uncontrolled that makes air pollution.



2. Strategic Plan for Solid Waste Management

Regional disposal site (TPA Regional) like implemented in Mamminasata Metropolitan Area (Makassar, Sungguminasa, Maros and Takalar) and in Sarbagita Metropolitan Area (Denpasar, Badung, Gianyar and Tabanan).
The target for developing regional disposal sites in Indonesia from year 2010 to year 2014 is 11 locations.



3. Supporting for PPP Solid Waste Management Projects

- Law number 18 year 2008 regarding Solid Waste Management which recommends local governments to close open dumping disposal site as of the date of enactment of this law. In the future, the final disposal sites must be operated by sanitary landfill system.
- Minister of Public Works Regulation number 21 year 2006 regarding Policy and Strategy for Solid Waste Management which recommends the increase of level of service and quality of solid waste management, and promoting private sector partnership.



4. Solid Waste Potential Projects for PPP

- Namo Bintang disposal site in Medan city. The total area of the disposal site is 17 ha. The estimated investment (LFG Flaring system) is US\$ 7.19 million.
- Jatibarang disposal site in Semarang City. The total area of the disposal site is 44.5 ha. The estimated investment (LFG Flaring system) is US\$ 6.21 million.



III. Wastewater Management

1. Strategic Plan

Developing the off-site systems such as implemented in Denpasar city through the Denpasar Sewerage Development Project (DSDP) with support of Japan assistance. The target for developing this kind of infrastructure from year 2010 to year 2014 is 11 cities. Besides this system, we also plan up to year 2014 to develop the on-site system of wastewater for 210 locations.



2. Potential Wastewater Management Projects for PPP

- Water recycling of Suwung wastewater treatment plant in Bali. The beneficiary is to supply water for watering city park of Denpasar Bali. The estimated project cost is US\$ 1.63 million.
- Water recycling of Bojongsoang wastewater treatment plant in Bandung West Java. The beneficiary is to supply water for non-domestic use (agriculture, fisheries and industrial). The estimated project cost is US\$ 1.23 million.



Thank You



Attachment



PPP in Water Infrastructure, Solid Waste and Waste Water Management In Indonesia

Tokyo, February 14, 2011

BUDI YUWONO Director General of Human Settlements Ministry of Public Works Republic of Indonesia

The Second Meeting of PPP Council for Overseas Water Infrastructure



DIRECTORATE GENERAL OF HUMAN SETTLEMENTS MINISTRY OF PUBLIC WORKS

General Information

- Population in Indonesia
- Area
- Number of Provinces
- Number of cities/districts
- Number of Metropolitan/big/medium cities: 10/13/56

- : 237 million inhabitants (2010)
- : 5,180,053 km²
- : 33
- : 497





STRATEGIC ISSUES OF WATER SUPPLY

- The quantity of raw water in urban area becomes more scarce
- Pipe drinking water services is still low (In the Year 2010, National average = 47.7%).
- Non revenue water is still high (national average = 33%)

NATIONAL DEVELOPMENT POLICY FOR WATER SUPPLY SYSTEM

WATER SUPPLY (Public Works Minister Regulation No. 20/2006)

- Improving the quality and increasing coverage of service
- Developing alternative sources of funding and financing mechanism
- Institutional strengthening and legislation
- Increasing security and quality of raw water
- Increasing community participation

NATIONAL STRATEGIC PLANNING ON WATER SUPPLY SYSTEM DEVELOPMENT 2010 - 2014

- Increasing production capacity in urban, sub urban (820 IKK), strategic areas (fish harbor, remote areas, boundaries areas, remote islands) and rural areas (4,650 villages) until year 2014 by : 14,120 lt/s.
- Facilitating Public Private Partnership (PPP) Project for 23 locations
- Implementation reuse water supply in 8 locations
- Facilitating water supply for urban low income community in 577 locations
- Facilitating 107 Local Water enterprises (PDAMs) in accessing loan to local banks for expanding services

Strategy for Achieving Target of Water Supply Development

Use all the potential sources of funding and financing patterns are available as follows:

- Contribution of Public Works Strategic Plan is to improve access to water for 16,942,200 inhabitants (6.84%).
- The potential contribution of Local Water Enterprices/ PPP / Banking Loans / budgets to increase access to Water Supply for 25,397,390 inhabitants (10.30%)
- Encouraging the development of independent water supply system for the 13,153,165 inhabitants (5.31%) which can be fulfilled by the Water Supply System not protected through the piping network



Budget Requirement for MDGs Achievement

	US \$ Million			0/
Source of Fund	Urban	Rural	Total	%
Government	1.05	0.81	1.86	40
Non Government (Loan, PPP, etc)	2.25	0.54	2.79	60
Total	3.31	1.35	4.66	100

INVESTMENT OPPORTUNITIES ON

WATER SUPPLY PROJECTS

JATIGEDE WATER SUPPLY

: BOT

- PPP MODALITY
- CAPACITY PLANNING : 6,000 lps
- ESTIMATED PROJECT COST: US\$ 357.6 Million
- ESTIMATED IRR
- BENEFICIARY

- : 20.0 %
- : Provision for 2,4 million inhabitants or 480,000 connections

PROJECT LOCATION



: West Java Province

- Sumedang RegencyMajalengka Regency
- Indramayu Regency
- Cirebon Regency
- Cirebon Municipalit