CHAPTER-4 PPP-BASED WATER SUPPLY PROJECTS

4.1 Current Situations and Issues of Water Supply Projects

4.1.1 Current Situations

It was before 1999 that the central government financed all public utility investments through grants, subsidies, or loans to the regional governments. In 1999 the central government devolved authority for all aspects of local infrastructure and service delivery, including planning, providing, financing, and managing water supply to district and city governments.

The Water Resources Law 7/2004 recognized the possibility of development of drinking water supply systems by cooperation, state-owned enterprises, regional enterprises, private sector enterprises and the communities. In 2005, the President Regulation 67/2005 and the President Regulation 16/2005 were approved. They stipulated private sector participation in water supply services, thereby breaking the monopoly of the PDAMs. The regulations also clarified the roles and responsibilities of regional governments, PDAMs, and private sector.

After decentralization, the financing responsibilities for current operation of water supply rested with the PDAMs. However, many of the PDAMs are unable to provide minimum services to consumers and are financially unhealthy due to inadequate tariffs.

There are two main issues affecting Indonesia's water supply sector, which are (i) low service coverage of water supply, and (ii) financially unsustainable PDAM operation.

Low service coverage of water supply has a major impact on economic development, health, and wellbeing of the population. The Millennium Development Goal (MDG) set targets of the national coverage of adequate water supply at 80% in 2015. However, the achievement in 2004 was merely 55%. In terms of the piped water supply, the MDG are set as 47% in urban areas and 20% in rural areas, while the achievement in 2004 were 33% in urban areas and 7% in rural areas. The Government of Indonesia is requested to accelerate the efforts to achieve the targets.

Many of the PDAMs throughout Indonesia are barely able to provide minimum services to consumers due to their unhealthy financial status. PDAMs are generally limited in size and the revenue collection is low. The lack of cost recovery tariffs is a phenomenon that can be observed at many PDAMs. Because of these difficulties, many PDAMs have reduced or abandoned the O&M and investment activities, which resulted in deteriorating assets and low service coverage. According to the BPP SPAM's survey in 2007, out of 306 PDAMs nationwide, only 79 (25%) PDAMs were assessed as "healthy". The others were classified as either "less healthy" or "unhealthy".

4.1.2 PPP Laws and Regulations for Water Supply Projects

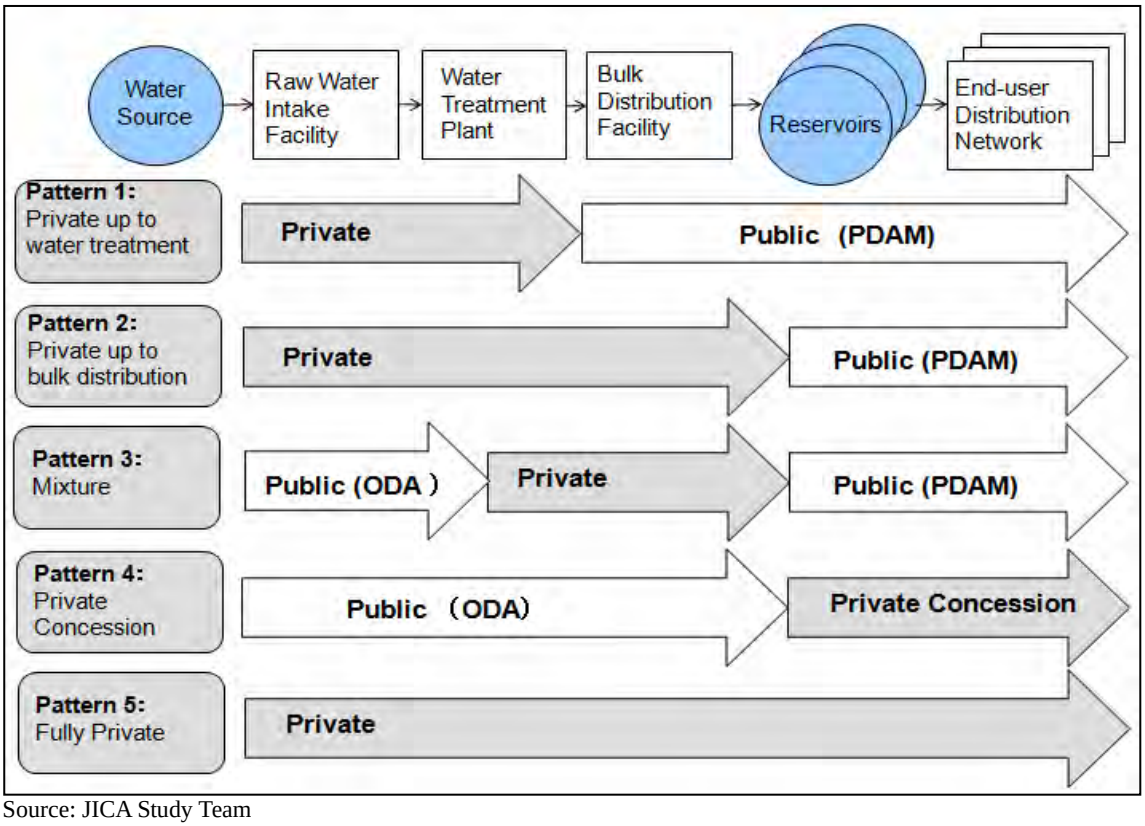
Chapter 2 details laws and regulations related to undertake PPP based water supply projects in Indonesia. Three key laws and regulations are(i) Water Resources Law No. 7/2004 on Water Resources, (ii) MPW Regulation No.16/2005on local Government role for water supply, and (iii) Presidential Regulation No,67/2005.

The Water Resources Law 7/2004 stipulates: Central and local government is responsible for development of water supply system; The state owned enterprises and/or regionally owned enterprises carry out the development of the drinking water provision system; Cooperatives, private enterprises, and the community may participate in the development of the drinking water provision system.

Authority and responsibility of organization concerned in water supply system is regulated by MPW Regulation No.16/2005. Those organization concerned include central government, provincial government, district/city government, state owned company, cooperative, private firm, and community members.

Perpres 67 is an important legal imperative for implementation of PPP projects. Among key regulations stipulated are (i) purposes of the cooperation project on the provision of infrastructure, (ii) necessary principles and documents for the cooperation on the provision of infrastructure, (ii) proposal of projects from business entities, (iv) initial tariff and tariff adjustment, and (v) risk management and government support.

4.1.3 PPP Modalities



Source: JICA Study Team

Figure 4.1.3-1: Examples of PPP Scheme for Water Supply Project

Examples of PPP scheme applicable to water supply projects are shown in Figure 4.1.3-1. Water supply is considered as a value chain which starts at water source and ends at distribution to end users. Required facility at the most upstream of the value chain is raw water intake facility. Then needed are water treatment plant, bulk water transmission facility, reservoir, and distribution network. In each of facility or work process, either public or private can partake. Depending on the level of private/public mix and facility of which private/public take care, numerous patterns of PPP are possible.

4.1.4 Issues in Promoting Water Supply Projects by PPP

There are two key issues to be solved in promoting PPP-based water supply projects, which are (i) lack of investment to improve distribution system of PDAMs, and (ii) difficulty of stakeholder coordination in inter-municipal projects.

(1) Lack of investment to improve distribution systems

Many PDAMs are in a poor financial condition and are experiencing losses. As a result investments to improve and expand their deteriorated distribution systems are lacking. This means that even if the water production is increased, the produced water cannot be fully consumed by the end users. Water loss or non revenue water is such that bulk water supply, which is the area where PPP is easier to be applied, cannot be technically and financially meaningful. Reasons of the poor financial performance by PDAMs are (i) inability to set cost-recoverable water tariffs, (ii) high level of UFW, (iii) lack of capable management resources, and (iv) lack of government budgetary support.

<u>Inability to set cost-recoverable water tariffs</u>

Water tariffs are usually recommended by each of PDAMs and approved by the head of local governments. Two problems here are (i) many PDAMs lack ability of setting appropriate tariff by which required costs can be recovered; and (ii) chief of local government often disapproves or delays recommended tariff revision due to political reasons.

<u>High level of UFW</u>

Many PDAMs suffer water loss of as much as 30-50%. The UFW mainly comprises technical loss (leakage) and commercial loss (illegal connection, non-payment). PDAM’s ability to rehabilitate aging pipeline network and to control illegal connections will have a direct impact on its financial performance.

<u>Lack of management resources</u>

Many PDAMs are overstaffed and lack appropriate senior and middle management. PDAMs are companies established under the local governments. Although PDAMs are supposed to be financially separated from the local governments, the PDAMs are still dependent on the local governments through equity participation and subsidy. Some PDAM’s managers are being replaced by

more capable managers from the local governments. However major changes and capacity building are still required in PDAM structures and management.

Lack of government budgetary supports

The decentralization policy of Indonesia placed the financial responsibility of water supply to local governments. However local governments themselves are not self-sustainable. They are heavily dependent on subsidies and grants from higher levels of government. This means that local governments cannot support ailing their PDAMs by their own funds. Consequently this lack of financial sustainability has resulted in heavy debts incurred by PDAMs to the central government.

(2) Difficulty of Stakeholder Coordination in Inter-municipal Projects

As the Indonesian water supply is operated by more than 300 PDAMs, private entities, and community groups, the size of each operation is generally small and they are difficult to be financially sustainable. Consequently, in order for a PPP based water supply project to be attractive to private investors, consolidation or joint operation of small water supply operations is necessary. When a water supply operation involves participation of plural municipalities or regencies because of the supply process cutting across those areas, the provisional government is supposed to organize the operation. If a project is inter-provincial, the central government assumes the coordination role. After decentralization, the power of central government is not as strong as before, thus it often takes a long period to build consensus of lower levels of local government. Different levels of PDAM's financial condition and thereby different water tariffs adopted also make such coordination among PDAMs and the local governments difficult especially when the same water is provided to several PDAMs under a bulk water supply project.

To solve the above issues, particularly the lack of financial sustainability of PDAMs, the central government has made further efforts. Recent efforts included reduction of debts for about 50 PDAMs which had submitted its financial restructuring plan acceptable to the central government. Further supports are expected to be given to the PDAMs under accepted financial restructuring plan. These new supports will be 70% guarantee by governments to commercial loans to be extended to the PDAMs, interest subsidy of about 4 percentage points to commercial loans to the PDAMs and one-off grant of Rp 2 million per new connection to the PDAMs that have increased the number of connections.

4.1.5 Possibility of Participation of Private Companies

We chose some organizations concerned and carried out an interview survey for our proposed PPP scheme. Interviewed organizations were Public and Private Corporation of Water Works and Business Company.

The Public Corporation of Water Works could not invest directory to the Project due to the Local Autonomy Act could only send their human resources. Heretofore, they had assisted the foreign water woks staff under JICA scheme.

As it was cooperation scheme, it was carried out by the own (Japanese side) budget. On this PPP scheme, they hope to participate with business.

The Private Corporations for Water Works also have an interest in the Project. They considered the risk of land acquisition, water tariff increase and PDAM financial. They got poor impression for Jakarta Water Supply concession contract.

The Business Company also had interest. They considered to participant the water works with low country risk like government stability, contract condition, good local partner and so on.

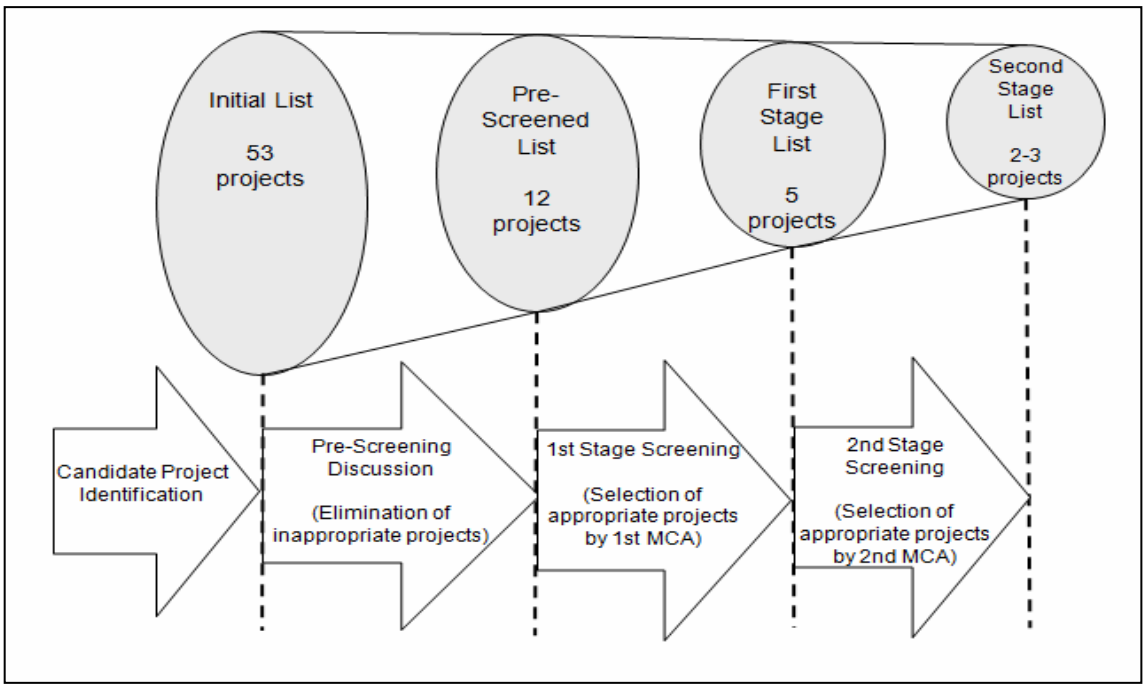
Table 4.1.5-1 shows the summarized the result of the interview survey.

Table 4.1.5-1 Possibility of the Participation to the PPP Water Supply Projects for Organization

Public Corporation for Water Works
- The overseas PPP project interest very well. - For Japanese law, they can not to invest in the Project. - They can input human resources. (it is not grant like JICA scheme)
Private Corporation for Water Works
- Government guarantees that the risk concerning the land acquisition is necessary. - Risk of exchange rate fluctuation of water tariff revenue should be examined. - Since there is a possibility that the public portion will be delayed behind the private portion along the section split, construction of private portion starts when the completion of public portion is confident. - Private potion should include WTP construction. - Improvement of PDAM financial aspect - The distribution also has interest.
Business Company
- Improvement of PDAM financial aspect - The distribution also has interest. - Stability of Indonesian Government

Source: JICA Study Team

4.2 Project Screening Process



Source: JICA Study Team

Figure 4.2-1: Water Supply Project Screening Process

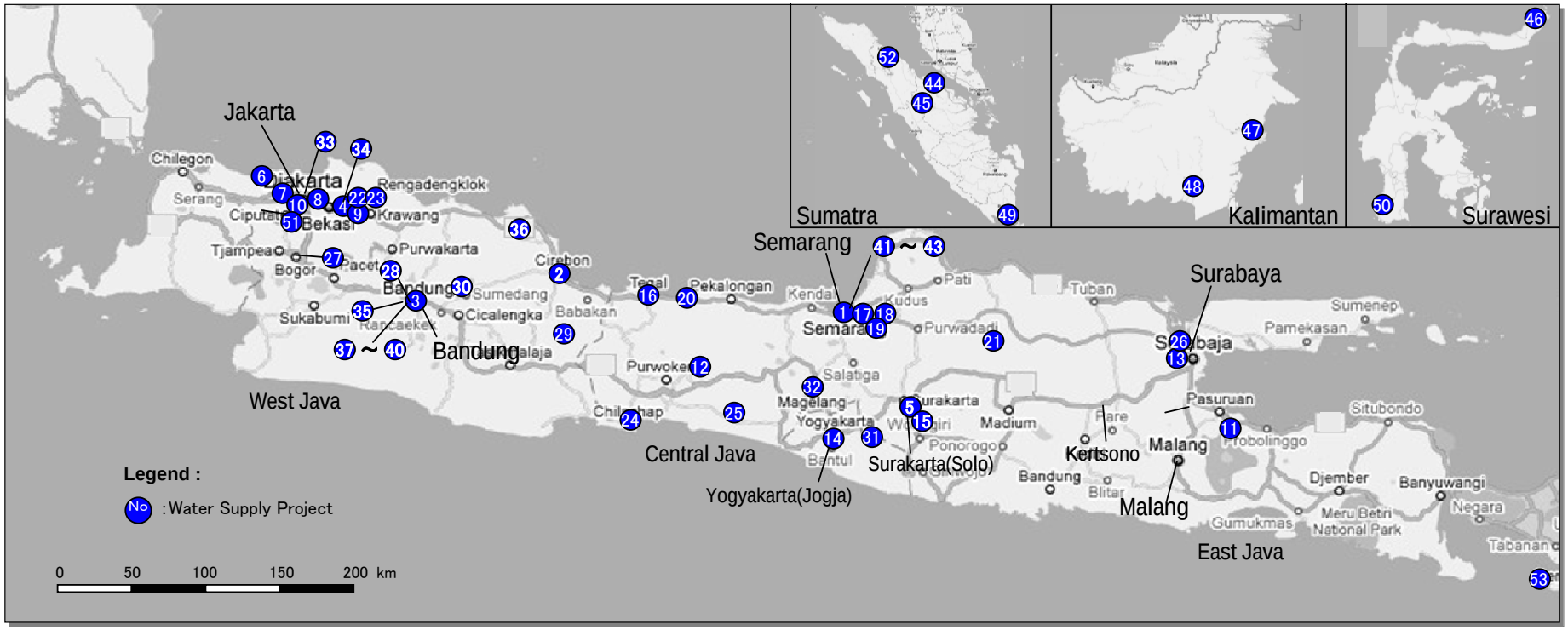
The aim of this study was to select two or three water supply projects implementable by a PPP scheme. The selection was performed in four steps (Figure 4.2-1). As the first step, we identified 53 water supply projects which appeared on government project information materials. Project scrutiny needs desk-top study of the existing F/S reports and site visits for data confirmation. We did not dare to scrutinize all the 53 projects. This was because our study period in Indonesia was not sufficient to cover all the projects, and because not all the projects had the F/S report available to us.

Thus, as the second step, we asked CIPTA KARYA to eliminate inappropriate projects out of the 53 identified projects. Consequently 41 projects were rejected and 12 remained. As the third step, we screened 6 projects out of the 12 based on a multi-criteria analysis (MCA). For the selected 6 projects, we deepened the investigation including field visits and performed another MCA. Finally three projects were selected as the most appropriate project for PPP.

4.3 Pre-Screening

4.3.1 List of Original Candidate Projects

The Government of Indonesia occasionally made a list of potential infrastructure projects which could be operated by PPP schemes. Such occasions included the Infrastructure Summit 2005, the Infrastructure Conference 2006, the BPP SPAM Leaflet 2008, and the PPP Book 2009. First we identified water supply projects which appeared on those materials. They totaled 53. The names and locations were entered into a map (Figure 4.3.1-1).



Water Supply Project		
No	Project	
1	Uprating WTP Kali Garang Semarang	*1)
2	Cirebon Bulk & Water Supply	*1) *3)*4)
3	Jatinangor Water Supply	*1)
4	Cikarang Water Supply	*1)
5	Pondok Gede Water Supply	*1) *3)*4)
6	Sepatan Water Supply	*1)
7	Ciparens Tangerang Water Supply	*1)*2)
8	Kecamatan Benda & Cengkareng	*1)
9	Cileduk Water Supply	*1)
10	Tanjung Pinang Water Supply	*1)
11	Umbulan Water Supply	*1)
12	Karang Pilang IV Bulk Treated W	*1)
13	Menganti Water Supply	*1)
14	Greater Yogyakarta & Magelang	*1)

No	Project	
15	Surakarta-Sukoharjo Sukoharjo	*1) *4)
16	Tegal Water Supply Water	*1)
17	Regency&City of Semarang	*1)
18	East Semarang New Water Supply	*1)
19	Semarang Raw Water Supply	*1)
20	Pemalang Water Supply	*3)
21	Jambi Water Supply	*3)
22	Munici. Bekasi Water Supply	*3)
23	Regency Bekasi Water Supply	*3)
24	Cilacap Water Supply	*3)
25	Kebumen Water Supply	*3)
26	Gresik Water Supply	*3)
27	Bogor Water Supply	*3)
28	Bandung Water Supply	*2) *4)
29	Subang Water Supply	*3)

No	Project	
30	Sumedang Water Supply	*3)*4)
31	Kanan Water Supply	*2)
32	Magelang-Kartamantul WS	*3)
33	DKI Jakarta- Bekasi- Karawang	*4)
34	West Cikarang & Cibitung Bekasi Rege	*4)
35	Bandung Regency	*3)*4)
36	Indramayu Regency	*4)
37	West Bandung Alt. I- Water Conveyanc	*4)
38	West Bandung Alt. II- Water Conveyan	*4)
39	East Bandung Alt. I- Water Conveyanc	*4)
40	East Bandung Alt. II- Water Conveyanc	*4)
41	Semarang Alt. I- Water Conveyanc	*4)
42	Semarang Alt. II- Water Conveyanc	*4)
43	Semarang Alt. III- Water Conveyan	*4)
44	Dumai Water Supply	*1)*2)

No	Project	
45	Duri Water Supply	*1)
46	Manado Bulk Treated Water Supply	*1)
47	Samarinda Bulk Treated Water Supply	*1) *3)
48	Banjarmasin Bulk Treated Water Supply	
49	City of Bandar Lampung	*3)*4)
50	Regency of Maros	*3)*4)
51	DAM Karian(Tangerang)	*3)
52	Medan Municiparity	*4)
53	Klung kung Regency	*4)

Source) *1) Infrastructure summit 2005
*2) Infrastructure Conference 2006
*3) BPP-SPAM Leaflet 2008
*4) other latest sources (2009)

No.s in the table are correspondent to no.s in the figure

PPP Project (Water Supply) Location Map

Figure 4.3.1-1: Location of 53 Water Supply Projects

4.3.2 Dropped Projects and Reasons of Rejection

The original 53 potential water supply projects were pre-screened before stricter scrutiny to check appropriateness as an ODA based PPP project. Table 4.3.2-1 presents the result of the pre-screening where 12 projects were selected and 41 were rejected.

Out of those 41 projects, 11 were rejected because they had been absorbed in other projects. Nine projects dropped because of cancellation by local governments. Seven projects were rejected because they were to be financed by other than PPP. Six projects were rejected due to water resource problems. Other reasons of rejection included small capacity, already started project, and legal problem.

Table 4.3.2-1: Pre-Screening Result

No	Selected project	Project name	Reason of Rejection						
			Already started	Funded by other than PPP	Absorbed into other projects	Cancelled by local governmen	Problem in water resources	Small capacity (>100 l/s)	Legal problem
1		Uprating WTP Kali Garang Semarang			X				
2		Cirebon Bulk & Water Supply			X				
3		Jatinangor Water Supply				X			
4	X	Cikarang Water Supply							
5	X	Pondok Gede Water Supply							
6		Sepatan Water Supply	X						
7	X	Ciparens Tangerang Water Supply							
8		Kecamatan Benda & Cengkareng	X						
9		Cileduk Water Supply	X						
10		Tanjung Pinang Water Supply					X		
11	X	Umbulan Water Supply							
12		Karang Pilang IV Bulk Treated W		X					
13		Menganti Water Supply				X			
14		Greater Yogyakarta & Magelang							X
15		Surakarta-Sukoharjo Sukoharjo						X	
16		Tegal Water Supply Water					X		
17		Regency&City of Semarang						X	
18		East Semarang New Water Supply						X	
19	X	Semarang Raw Water Supply							
20		Pemalang Water Supply				X			
21		Jambi Water Supply	X						
22		Munici. Bekasi Water Supply				X			
23		Regency Bekasi Water Supply				X			
24		Cilacap Water Supply					X		
25		Kebumen Water Supply						X	
26	X	Gresik Water Supply							
27	X	Bogor Water Supply							
28		Bandung Water Supply			X				
29		Subang Water Supply			X				
30		Sumedang Water Supply				X			
31		Kanan Water Supply			X				
32		Magelang-Kartamantul WS			X				
33	X	DKI Jakarta- Bekasi- Karawang							
34		West Cikarang & Cibitung Bekasi Regency				X			
35	X	Bandung Regency							
36		Indramayu Regency					X		
37		West Bandung Alt. I- Water Conveyance					X		
38	X	West Bandung Alt. II- Water Conveyance							
39		East Bandung Alt. I- Water Conveyance					X		
40	X	East Bandung Alt. II- Water Conveyance							
41		Semarang Alt. I- Water Conveyance			X				
42		Semarang Alt. II- Water Conveyance			X				
43		Semarang Alt. III- Water Conveyance			X				
44		Dumai Water Supply		X		X			
45		Duri Water Supply		X		X			
46		Manado Bulk Treated Water Supply			X				
47		Samarinda Bulk Treated Water Supply		X					
48		Banjarmasin Bulk Treated Water Supply		X					
49	X	City of Bandar Lampung							
50		Regency of Maros						X	
51		DAM Karian(Tangerang)			X				
52		Medan Municiparity		X					
53		Klung kung Regency		X					
		Frequency	4	7	11	9	6	5	1

Source: CIPTA KARYA

4.3.3 Selected Projects

Twelve projects were selected by the pre-screening. Those project summaries are presented subsequently. Then each project cost is also summarized one table, our reviewed cost and the existing report's cost. Though the JABEKA project was estimated based on the local cost on the existing report, the Semarang project was estimated to take Japanese ODA into consideration on the existing report, for example. As these estimates were carried out to use different base, we could not make a comparison between each project easily. Therefore, each project needed to be estimated on same base and condition. We reviewed based on the existing water supply project in Indonesia and standard cost in Cipta Karya.

For reviewing, the projects were categorized two groups. One was the JABEKA and Umbulan Project another one was others. The former was large volume projects. Therefore, these reviews were carried out based on the large volume water supply project of near Jakarta. Others were carried out based on the Cipta Karya standard cost. The IRR etc. was also calculated based on our reviewed cost.

1) Cikarang Water Supply

The "Cikarang Water Supply & West Cikarang and Cibitung Bekasi Regency project" that is located at Bekasi regency, is selected at the pre-screening due to the high demand for water supply on those area in Bekasi regency as buffer zone to DKI Jakarta. The feasibility study had been completed three years ago and the study report was not found any more. The study was conducted under a technical assistance from Germany through the Investment Development Center (former name of BPP-SPAM).

2) Pondok Gede Water Supply

The Project has five physical components, comprising: (i) intake facility 330 l/sec at Caman and raw water conveyance pipe dia. 500mm with L=100 m; (ii) 2 Water Treatment Plants each 150 l/sec.; (iii) reservoir 3,300 m^3; (iv) distribution pipe network which consist of primary pipe dia. 600-250 mm with L= 20.2 km and secondary & tertiary pipe dia. 250-50mm with L=368.5km; and (v) 28,448 service connections by 2016 which consists of domestic connection 28,000 unit and non-domestic connection 448 unit. The estimated beneficiary population is 216,000 based on 120 l/sec per capita daily consumption. The estimated investment costs are as follows:

(Million Rp.)

Component	Reviewed Cost	Original Cost
1. Intake and raw water conveyance pipe	1,193	3,218
2. WTP 300 l/sec	51,810	30,182
3. Reservoir	9,009	3,319
4. Distribution pipe network	85,728	5,934
5. Connections	16,416	47,036
Total	164,158	189,689

Source: JICA Study Team, Pre F/S

3) Ciparens Tangerang Water Supply

The project was originally designed to supply water to Ciparens and Tangerang,

both of which are located in Tangerang Regency. Ciparens and Tangerang was combined in one project and its pre-F/S was conducted under a technical assistance from ADB. The study concluded that there would be a shortage of water resources to cover both Ciparens and Tangerang. It was also concluded that Tangerang would get the first priority for water supply and Ciparens would not get water. This was because the water resources was located at Tangerang area. Since then, no feasibility study was conducted to evaluate the water supply only to Tangerang, therefore no F/S report exists.

4) Umbulan Project

The project has three physical components, comprising: (i) Intake 4000 l/sec. to supply Pasuruan city (110.87 l/sec.), Pasuruan Regency (420.86 l/sec.), Sidoardjo (1,369 l/sec.), Gresik (1,000 l/sec.), and Surabaya (1,000 l/sec.); (ii) transmission pipe totally 92km which is divided into four sections: Umbulah-Pohjentrek (dia. 1,800mm, L=20km), Pohjentrek-Porong (dia. 1,700mm, L=24km), Porong-Waru (dia. 1,400mm, L=22km), Waru-Gresik (dia. 1,000mm, L=26km); and (iii) Distribution to provide 883,944 household connections by 2015. The beneficiary population is 2,880,000 on the basis of 120 l/sec per capita daily consumption. The estimated investment costs are as follows:

(Million Rp.)

Component	Reviewed Cost	Original Cost
1. Intake construction	120,000	32,000
2. Transmission pipe	1,377,000	1,568,000
3. Distribution network	860,000	860,000
Total	2,357,000	2,460,000

Source: JICA Study Team, Pre F/S

5) Semarang Project

The Project has five physical components, comprising: (i) intake facility 1,050 l/sec; (ii) raw water conveyance pipe dia. 900mm, L=2.2km two lines; (iii) Water Treatment Plant 1,050 l/sec.; (iv) main transmission pipe dia. 700 with L=3.1km and dia. 450mm with L=9.7km; and (v) distribution system including distribution reservoir and distribution pipe 84.7km, serving a population of 174,930. The estimated investment costs are as follows:

(Million Rp.)

Component	Reviewed Cost	Original Cost
1. Intake, WTP and Transmission	639,536	455,000
2. Distribution system	63,525	369,000
Total	703,061	824,000

Source: JICA Study Team, Pre F/S

6) Gresik Water Supply

The Project has five physical components, comprising: (i) intake facility 134 l/sec and raw water conveyance pipe dia. 400mm with L=200 m; (ii) Water Treatment Plant 150 l/sec; (iii) reservoir 1,400 m^3; (iv) distribution pipe network where primary pipe using existing pipe dia. 600 mm and new network of secondary & tertiary pipe dia. 250-50mm with L=155.5km; (v) Total service connections only 9,075 by 2016 which consists of domestic connection 28,000 unit and non-domestic connection 448 unit due to new WTP not only for

supplying new service connections but also for supplying existing service connections. The estimated beneficiary population is 108,000 based on 120 l/sec per capita daily consumption. The estimated investment costs are as follows:

(Million Rp.)

Component	Reviewed Cost	Original Cost
1. Intake and raw water conveyance pipe	900	2,245
2. WTP 150 l/sec	25,905	22,988
3. Reservoir	4,452	7,212
4. Distribution pipe network	21,770	19,726
5. Connections	5,172	15,812
Total	58,201	67,983

Source: JICA Study Team, Pre F/S

7) Bogor Water Supply

The Project has five physical components, comprising: (i) intake facilities 250 l/sec, consist of Gunung Putri sub-system and Cileungsi-Jonggol sub-system ; (ii) New Water Treatment Plant 50 l/sec. at Gunung Putri, uprating existing WTP Gunung Putri from 100 l/sec to be 250 l/sec, and simple WTP 50 l/sec at Sodong Spring for Cileungsi-Jonggol sub-system including transmission pipe dia. 250 mm with L=12 km to reservoir Citra Indah; (iii) distribution system comprising main distribution pipe totally 7,4 km which is divided into 2 sections: Transyogi Road – Fly Over Cileungsi (dia. 300 mm L=4.4 km) and Transyogi Road – Cikeas (dia. 200 mm L=3 km), distribution network along 19,377 km, including reservoir 1,000 m^3 at Gunung Putri and reservoir 500 m3 at Citra Indah; and service connection 24,400 unit, serving an estimated population of 180,000 on the basis of 120 l/sec per capita consumption. The estimated investment costs are as follows:

(Million Rp.)

Component	Reviewed Cost	Original Cost
1. Intake	727	600
2. WTP 200 l/sec	15,213	41,250
3. Distribution	37,359	101,400
Total	53,300	143,250

Source: JICA Study Team, Pre F/S

8) JABEKA Project

The project has two physical components, comprising: (i) Water Treatment Plant 15,000 l/sec. to supply bulk water for DKI Jakarta (12,750 l/sec.), Bekasi Regency (500 l/sec.), Bekasi City (500 l/sec.), and Karawang regency (500 l/sec.); (ii) transmission pipe 58km with diameter 2,000mm two lines. The project plans to provide treated water to PAM JAYA and two PDAMs who are in turn expected to serve an estimated population of 10.8 million based on 120 l/sec per capita daily consumption. The estimated investment costs are as follows:

(Million Rp.)

Component	Reviewed Cost	Original Cost
1. Water Treatment Plant (WTP)	1,622,934	456,331
2. Transmission pipe	3,512,552	3,332,279
Total	5,635,435	3,778,610

Source: JICA Study Team, Pre F/S

9) Bandung Project

The Project has five physical components, comprising: (i) intake at Cikalong and raw water conveyance pipe; (ii) Water Treatment Plant 1,200 l/sec.; (iii) reservoir 20,000 m3; (iv) transmission pipe; and (v) Distribution to east part of Bandung City, south part of Bandung city and Bojongsoang district at Bandung regency, serving an estimated population of 288,000 on the basis of 120 liter/sec per capita daily consumption. The currently available intake capacity is 400 l/sec and another 800 l/sec is expected only when a raw water conduit tunnel from Cisangkuy River is constructed. The estimated investment costs are as follows:

(Million Rp.)

Component	Reviewed Cost	Original Cost
1. Intake and raw water conveyance pipe	3,048	3,600
2. WTP 1,200 l/sec	242,204	120,000
3. Reservoir	54,600	17,820
4. Transmission pipe	437,052	43,290
5. Distribution	312,473	312,473
Total	1,049,377	497,183

Source: JICA Study Team, Pre F/S

10) West Bandung Alt. II- Water Conveyance

The Project has five physical components, comprising: (i) intake facility 300 l/sec and raw water conveyance pipe dia. 500mm with L=1000 m; (ii) Water Treatment Plant 300 l/sec; (iii) ground reservoir which consists of temporary reservoir 3,500 m3 at same location with WTP, buffer reservoir 3,500 m^3 located 1,250 m from WTP, and distribution reservoir 5,000 m3 located on the hill 1750 m from buffer reservoir; (iv) distribution pipe network which consist of primary pipe dia. 500-250 mm with L= 12.4 km and secondary & tertiary pipe dia. 250-50mm with L=479.85km; and (v) 37,410 service connections which consists of domestic connection 36,950 unit and non-domestic connection 460 unit; serving an estimated population of 216,000. The estimated investment costs are as follows:

(Million Rp.)

Component	Reviewed Cost	Original Cost
1. Intake and raw water conveyance pipe	2,625	4,792
2. WTP 300 l/sec	51,975	7,799
3. Reservoir	32,760	31,636
4. Distribution pipe network	59,344	89,284
5. Connections	21,530	25,928
Total	168,235	159,440

Source: JICA Study Team, Pre F/S

11) East Bandung Alt. II- Water Conveyance

The East Bandung project is designed to supply water to the eastern part of Bandung. The raw water is planned to be taken either from south of Bandung (Cikalong river), west of Bandung (Saguling dam) or north of Bandung (Subang/Lembang). In June 2009, the pre F/S was still undergoing and planned to be finished by the end of 2009. Thus, at our project screening timing, the pre F/S report was not available.

12) Lampung Project

The Project has two physical components, comprising: (i) intake facility 500 l/sec; (ii) raw water conveyance pipe dia. 560mm with L=20km; (iii) Water Treatment Plant 500 l/sec.; (iv) transmission pipe dia. 560mm with L=9km; and (v) distribution system including reservoir 4,000 m3 and distribution network at three zones, serving an estimated population of 360,000 on the basis of 120 l/sec per capita daily consumption. The estimated investment costs are as follows:

(Million Rp.)

Component	Reviewed Cost	Original Cost
1. Intake	1,452	123,488
2. Raw water conveyance pipe	258,214	5,712
3. WTP 500 l/sec	86,350	57,587
4. Transmission pipe	116,196	13,329
5. Reservoir and distribution network	118,420	43,690
Total	580,632	243,807

Source: JICA Study Team, Pre F/S

4.4 First Stage Screening

4.4.1 Process of First Stage Screening

The multi-criteria analysis (MCA) was used in order to score the PPP appropriateness of the 12 candidate projects, and select six projects as a passer of the first stage screening.

First, the screening process started with selection of criteria used for the multi-criteria analysis (MCA). Seven MCA criteria were selected on the basis of technical and financial characteristics often featured in a water supply project. Opinion of the Indonesian side was also taken into account. At this stage, not all of F/S reports of the 12 projects were available. Data verification of each F/S report available had just started, thus some criteria data were either unavailable or unverified. In such a case, we decided to use data obtained from interviews with relevant persons or deduced from known facts.

Secondly, weight of each criterion was determined based on its relative importance to other criteria. The weight scale ranged from 0 to 1, aggregating all the weights to 1.

Thirdly the scoring rule was determined. Table 4.4.1-1 shows the seven criteria selected and the weights and scoring rules of each criterion. Each criterion and the scoring rules are detailed in subsequent paragraphs.

Table 4.4.1-1: Scoring Rules of MCA at First Stage Screening

Criteria	Scoring Rule	Weight
1) Unavailability of alternative water	No alternative water exist= 3 points; Alternative water narrowly exist= 2 points; Alternative water abundantly exist = 1 point	14%
2) Accessibility to raw water resources	Very Accessible= 3 points; accessible= 2 point; Not accessible= 1 point	22%
3) Production capacity	Planned size of production capacity ≥ 1000 L/sec.= 3 points; 500-999 L/sec.= 2 points; < 499 L/sec.= 1 point	7%
4) Existing tariff level	Existing Tariff Level ≥ Rp 3,500 per m3 =3points; 2000-3499 per m3 =2points; <1999 per m3 = 1point	7%
5) Industry & commercial water demand	Industry and commercial water is expected to account for more than 6% =3Points; 3-6% = 2points, >3% =1point	14%
6) Beneficiary population of retail water	Beneficiary population of retail water >1 million =3Points; 0.5-1million = 2points, <0.5 =1point	22%
7) Population growth	Population growth in served area >3% = 3points; 1-3%= 2points; <1% = 1point	14%

Source: JICA Study Team

1) Unavailability of Alternative Water

It is known that demands for piped water are strong in all the areas of candidate projects. The water consumption is suppressed and the population suffers from water shortage if alternative water such as well water, vendor supplied water, and bottled water does not exist. This criterion is to examine the unavailability of the alternative water. The scoring principle is that the less alternative water, the better. We gave 3 points if no alternative water existed. If alternative water narrowly existed, the score is 2 points. If alternative water abundantly existed, the score was 1 point.

2) Accessibility to raw water resources

Raw water is, first and foremost, important raw material in water treatment process. The accessibility to raw water resources has both technical and financial connotations. When raw water is located in a remote area or physically inconvenient area, the water treatment facility may not rely on the raw water. Even if the raw water exists in a convenient area, the water right may be allocated only to irrigation purpose and may not be available for piped water production. It is also possible that a price of raw water or the water right may be prohibitively high for the water supply operation. This criterion was used to examine the ease of securing raw water with reasonable conditions. The scoring principle is that the more accessible to raw water, the better. If raw water is very accessible, the score is 3 points. The score will be 2 points if the raw water is somehow accessible, and 1 point if not accessible.

3) Production capacity

The production capacity is one of key technical criteria when the size of a water supply project is of a matter of concern. The scoring principle is that the bigger

the production capacity, the better. A project with a planned size of production capacity is more than 1,000 L/sec (liter per second) is given 3 points. If the capacity is 500 – 1,000 L/sec, the score is 2 points. If less than 500 L/sec, the score is 1 point.

4) Existing tariff level

Planned tariffs presented in the F/S reports of each project were not necessarily at a reasonable level. Sometimes they were set at an optimistically high level, therefore they could not be taken a realistic indicator to predict the future soundness of the project. The existing tariff level is regarded to mirror the likeliness of future tariff level. The higher the existing tariff level, the higher the future tariff can be. The higher the future tariff, the financially sounder the project is. Based on this principle, the highest 3 points is given if the existing tariff level is more than Rp 3,500 per m3. If the existing tariff is between Rp 2,000 and Rp 3,500 per m3, the score is 2 points. If the tariff is less than Rp 2,000, the score is 1 point.

5) Industry and commercial water demand

The industry and commercial water tariff is usually set at a much higher price than that of domestic water. Thus having a higher percentage of customer classification in industry and commercial water is considered favorable to a water supply operation. We give 3 points to a project where the industry and commercial water is expected to be more than 6% of the total. If it is between 3 and 6%, the score is 2 points. If it is less than 3%, the score is 1 point.

6) Beneficiary population of retail water

This criterion is used to surmise economic benefit which households can enjoy through a water supply project. The number of population benefitted from a project is generally correlated with its economic benefit derived from use of the new water. The scoring principle is that the more beneficiary population, the better. A project which will have a beneficiary population of retail water of more than 1 million is given 3 points. If the beneficiary population is between 0.5 and 1 million, the score is 2 points. If it is less than 0.5 million, the score is 1 point.

7) Population growth

Financial and economic benefit of a water supply project can be indicated also by population growth. Thus the scoring principle is that the more population growth, the better. We score 3 points to a project whose served area has an annual population growth rate of 3% or more. The score is 2 points if the growth rate is between 1% and 3%, and 1 point if less than 1%.

8) FIRR

It is worth mentioning the FIRR as a criterion we did not adopt at the first stage screening. A merit of FIRR is that financial viability of a project can be represented by a single FIRR in which many variables are factored in. Among most influential factors that impact the FIRR are capital cost, O&M cost, post-implementation (operation) period, and water tariff.

The FIRR however, is easy to manipulate by changing those factors at calculators' discretion. For example, if a future water tariff is optimistically assumed at Rp 6,000 per cubic meter and all other conditions are unchangeable, the FIRR will become much higher, compared with the case where Rp 3,000 is assumed.

Another point we should heed in interpreting FIRRs is a difference between nominal terms and real terms. FIRRs in real terms are rates that include no inflationary effect. While FIRRs in nominal terms are rates that have inflation already factored in. The inflation often reaches a significant level in developing countries. Indonesia has experienced many inflationary periods in the past. Table 4.4.1-2 shows inflation rates of the recent past in Indonesia.

Table 4.4.1-2: Year-on-Year Inflation Rate of Indonesia

	Dec/2003	Dec/2004	Dec/2005	Dec/2006	Dec/2007	Dec/2008	May/2009
Inflation	5.06%	6.40%	17.11%	6.60%	6.59%	11.06%	6.04%

Source: Statistics Indonesia

For example, a project proposed in 2005 with an FIRR in real terms of 5%, could have an FIRR in nominal terms of 22% at the same time. Multilateral development banks such as World Bank and Asian Development Bank evaluate the financial viability of a revenue-generating infrastructure project by using the FIRR in real terms, in comparison with the opportunity cost of capital. On the other hand, investment decisions by private sector are often made based on FIRRs in nominal terms. In this sense, it is of fundamental importance to clarify whether the FIRR in question is computed in real terms or nominal terms.

We examined calculation factors used in the FIRR computation and the FIRR type computed in the F/S reports of each candidate project. The results are summarized in Table 4.4.1-3. It is noted that the FIRRs are usually computed in nominal terms. The operation period ranges between 15 and 25 years. The FIRR calculations differ in ways of including (i) price contingency in the capital costs, (ii) inflation factor in O&M costs, and (iii) tariff increase in revenue flows. Because of the dissimilarity, we concluded that those FIRRs could not be logically compared with each other.

Table 4.4.1-3: Comparison of FIRR Calculation Factors

Project	FIRR shown in F/S report	Operation period (year)	Price contingency in capital cost	Inflation factor in OM cost	Inflation factor in water tariff (tariff increase)	Assumed water tariff (Rp/m3)	Type of FIRR
Cikarang Water Supply	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pondok Gede Water Supply	9%	25	No	Yes	Yes	4,116	Nominal
Ciparens Tangerang Water Supply	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Umbulan Water Supply	16.4%	25	No	Uncertain	Yes	2,500	Nominal
Semarang Raw Water Supply	14%	25	Yes	Yes	Yes	6,889	Nominal
Gresik Water Supply	4%	25	No	Yes	Yes	3,779	Nominal
Bogor Water Supply	11.27%	20	No	Yes	Uncertain	4,880	Nominal
DKI Jakarta-Bekasi-Karawang	17.0%	20	Yes	No	Yes	2,369	Nominal
Bandung Regency	24.63%	20	Uncertain	No	Uncertain	2,959	Probably nominal
West Bandung Alt. II- Water Conveyance	18.07%	25	No	Uncertain	Yes	2,530	Nominal
East Bandung Alt. II- Water Conveyance	N/A	N/A	N/A	N/A	N/A	N/A	N/A
City of Bandar Lampung	20.0%	15	No	Uncertain	Yes	5,234	Nominal

N/A = Not available

Source: JICA Study Team

4.4.2 Result of First Stage Screening

The result of the first stage screening is summarized in Table 4.4.2-1. Six high-ranking projects, in order of score, were (1) Umbulan, (2) JABEKA (Jakarta-Bekasi-Karawang), (3) Pondok Gede, (4) Bandung, (5) Semarang, and (6) Lampung. These projects proceeded to the second stage screening.

Table 4.4.2-1: Results of First Stage Screening

Criteria	1 Cikarang Water Supply & West Cikarang & Cibitung Bekasi	2 Pondok Gede Water Supply	3 Ciparens Tangerang Water Supply	4 Umbulan Water Supply	5 West Semarang New Water Supply	6 Gresik Water Supply	7 Bogor Water Supply	8 DKI Jakarta-Bekasi-Karawang	9 Bandung Regency	10 West Bandung Alt. II- Water Conveyance	11 East Bandung Alt. II- Water Conveyance	12 City of Bandar Lampung
1) Unavailability of alternative water	**1**	**3**	**1**	**3**	**3**	**1**	**2**	**1**	***2***	***2***	***2***	***2***
2) Accessibility to raw water resources	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	***2***	**3**
3) Production capacity (data, L/sec)	***2***	**1 (330)**	***2***	**3 (4,000)**	**3 (1,050)**	**1 (134)**	**1 (250)**	**3 (15,000)**	***2***	**1 (300)**	***2***	**1 (499)**
4) Existing tariff level (data, Rp./m3)	***2***	***2***	***2***	**2 (2,366)**	***2 (2,402)***	**1 (1,873)**	***3*** **(3,500)**	**2 (2,627)**	**2 (2,154)**	***2***	***2***	***2***
5) Industry and commercial water demand (data, %)	**3 6%>**	**1 <3%**	**3 6%>**	**3 6%>**	**3 6%>**	**3 6%>**	**1 <3%**	**3 6%>**	**3 6%>**	**3 6%>**	**3 6%>**	**3 6%>**
6) Beneficiary population of retail water (data, thousand)	***2***	**2 (540)**	***2***	**3 (2,880)**	**1 (175)**	**1 (108)**	**1 (180)**	***2***	***2***	**1 (102)**	***2***	**2 (581)**
7) Population growth (data, %)	***2***	**3 (3.76)**	***2***	**1 (0.93)**	**2 (1.37)**	***2***	***2***	**3 (4.33)**	**2 (2.10)**	**2 (2.65)**	***2***	**2 (1.04)**
Overall Score	2.15	2.36	2.15	2.58	2.28	1.72	2.00	2.36	2.29	2.00	2.07	2.22
Selected Project		✓		✓	✓			✓	✓			✓

Note: "No data" gets 2points (italicized and underlined).

Source: JICA Study Team

4.5 Second Stage Screening

4.5.1 Process of Second Stage Screening

The passers of the first stage screening were (1) Umbulan, (2) JABEKA, (3) Pondok Gede, (4) Bandung, (5) Semarang, and (6) Lampung. In order to evaluate those projects, the MCA was used again. The MCA at the second stage screening differs from the MCA at the first stage screening in types of selection criteria used and level of data confirmation. The criteria of the second stage screening are more detailed and require more time for confirmation.

After the first stage screening was complete, the study team was informed by CIPTA KARYA that Pondok Gede project should be omitted. This was because the water demand in the project area turned out to be too little to justify the project. As a result of this omission, we decided to conduct field investigations in five project areas (Semarang, Umbulan, Jakarta-Bekasi-Karawang, Bandung and Lampung). Findings of the filed investigations were used in the MCA.

A total of 14 criteria were selected for the MCA, taking into account the availability of data and practicability of evaluation result. These criteria were grouped into three areas, (i) necessity, (ii) profitability, and (iii) implementability. For each criterion, a weight of 0 to 1 determined was determined and the scoring rule was designed. Opinion of the Indonesian side on the selection of criteria and the scoring was also taken into account. Those criteria adopted at the second stage screening, the scoring rules, and the weightings are summarized in Table 4.5.1-1. Each criterion and its scoring rule are detailed in subsequent paragraphs.

Table 4.5.1-1: Scoring rules of MCA at Second Stage Screening

Evaluation Criteria		Scoring Rule	Weight
1) Necessity 20%	1.1) Growth of per capita GRDP	GRDP per head growth rate >15% = 3points; 10-15% = 2points, <10% = 1point	5%
	1.2) Capital cost magnitude in GRDP	Project capital cost / latest GRDP >2% = 3points; 1-2% = 2points, <1% = 1point	5%
	1.3) Distribution component	Out of (i) Intake, WTP, (ii) Transmission, and (iii) Distribution, the capital cost for distribution accounts for more than 30% = 3points; 10-30% = 2 points; less than 10% = 1point	5%
	1.4) Pro-poor consideration	Percentage of population below the poverty line is more than 20% = 3 points; 10-20% = 2 points; less than 10% = 1 point	5%
2) Profitability 35%	2.1) FIRR	Estimated FIRR in real terms is 6-12% = 3 ponts; ≥ 12% = 2 points; < 6% = 1 point	10%
	2.2) EIRR	Estimated economic IRR in real terms is more than 24% =3Points; 12-24% = 2points, less than 12% =1point	5%
	2.3) Capital cost	Capital cost is more than Rp 2,000 billion = 3 points; Rp 1,000 - 2,000 billion= 2 points; less than 1,000 billion = 1 point	10%
	2.4) Production capacity	Planned size of production capacity ≥ 5000 l/sec.= 3 points; 1000-4999 l/sec.= 2 points; < 1000 l/sec.= 1 point	10%
3) Implementability 45%	3.1) Raw water securement	100% of planned raw water requirement is secured = 3points; 70-99% = 2 points; less than 70% = 1point	10%
	3.2) Technical risk / Readiness	Readiness of project. "Can start design & construction immediately if funds are prepared" = 3 points; "Will take another 1-3 years of preparation" = 2 points; "Will take more than 3 years" = 1 point	10%
	3.3) Government consensus	Consensus among central/provincial/municipal governments and other key stakeholders for project implementation is obtained = 3points; half obtained = 2 points; not obtained = 1point	10%
	3.4) PDAM performance	BPP-SPAM evaluation. Healthy = 3 points; Less healthy = 2 points; Unhealthy = 1 point	5%
	3.5) Impact on living environment	Potential negative impact on living environment. "Very limited and negligible"= 3 points; "Exists but compensation and communication can overcome = 2 points; "Significant and takes time to solve"or worse = 1 point	5%
	3.6) Land acquisition	Timeframe for remaining land acquisition provided that government has reasonable budget to pay for market price. Less than a year = 3 points; 1-3 years= 2 points; more than 3 years = 1point	5%

Source: JICA Study Team

1) Growth of per capita GRDP

Originally we tried to identify a reliable water demand growth data for each candidate project. However the F/S reports, inquiries to and interviews with the project stakeholders did not provide satisfactory data. Consequently we decided to use the per capita GRDP growth rate in recent years as it was considered to include two factors that could represent the water demand growth, (i) population growth and (ii) GRDP growth. The scoring principle is that the higher, the better. We scored 3 points if the per capita GRDP growth in the project area was more than 15% per year. If the rate was between 10 and 15%, 2 points were given. If it was less than 10%, 1 point was given.

2) Capital cost magnitude in GRDP

The project capital cost impacts not only on the project financial viability but also on the project economic viability. A part of the project capital cost would be included in the GRDP through fixed capital formation. We decided to use a simple ratio of capital cost amount to the annual GRDP of project area at municipal or regency level. The scoring principle is that the higher the ratio, the better. We scored 3 points if the ratio was more than 2%. If the ratio was between 1 and 2%, the score was 2 points. A 1 point was given if the ratio was less than 1%.

3) Distribution component

This was included as one of social viability criteria. The capital cost used for distribution is regarded as more directly beneficial to end users, a majority of which are households. Thus the scoring principle is that the higher the ratio of distribution capita cost to total capital cost investment, the better. We scored 3 points to a project with more than 30% distribution capital cost. If the ratio was 10 – 30%, the score was 2 points. If it was less than 10%, 1 point was given.

4) Pro-poor consideration

The pro-poor factor in a water supply project can be gauged by a ratio of net economic benefits accruing to the poor to the total net economic benefits of the project. Computing such a ratio requires an extensive analysis of the distribution of gains and losses as a result of the project between different project participants. In the absence of such extensive data, we tried to represent the project pro-poor factor by using an indicator obtainable at Statistics Offices, which was the percentage of population below the poverty line. If a project would be implemented in an area where more than 20% of total population was below poverty line, we scored 3 points. If the ratio was 10 to 20%, the score was 2 points. If the ratio was less than 10%, the score was 1 point.

5) FIRR

The FIRR was not used as a criterion at the first stage screening. This was because FIRRs shown in the F/S reports significantly lacked accuracy and comparability with each other. At the second stage screening, we attempted to estimate the FIRR of each project, using the same or comparable assumptions applicable to all projects. Key assumptions used in the FIRR estimation were as

follows.

- An incremental and after-tax basis is used.
- The implementation period is 4 years.
- The disbursement will be spread over the 4-year implementation period at a ratio of 10%, 40%, 30%, and 20%.
- The post-implementation period (operation period) is 25 years.
- The capital cost will be depreciated over the 25-year period at straight line method, and no salvage value is assumed
- All the prices are in constant 2009 values in Indonesian Rupee
- The projected volume of additional water supplied due to the project (new water) and other cost assumption factors are shown in Table 4.5.1-2.

Table 4.5.1-2: Assumptions Used in FIRR Computation

	Umbulan	Semarang	Jakarta, Bekasi, Karawang	Bandung	Lampung
New water production (liter/sec)	4,000	1,050	15,000	1,200	500
Project cost (Rp billion)	2,357	703	5,635	1,060	581
O&M cost (Rp billion/year)	53.6	4 to 7	206 to 441	2 to 5	18.9
Water source in served area					
Well water (%)	20%	20%	0%	20%	20%
Vendor supplied water (%)	10%	10%	0%	10%	10%
Treated (PDAM) water (%)	70%	70%	100%	70%	70%
of which, paid supply (%)	60%	60%	93%	60%	60%
of which, technical loss (%)	20%	20%	7%	20%	20%
of which, commercial loss (%)	20%	20%	0%	20%	20%
Depreciation (# of years- straight line)	40	40	40	40	40
Corporate income tax rate	30%	30%	30%	30%	30%
Water price assumption (Rp/m3)	2,600-3,300	2,700-3,300	2,500	2,400-3,600	3,500-5,000
Current domestic water price (Rp/m3)	2,400	2,500	N/A	2,200	3,200
Affordable based on poverty line* (Rp/m3)	3,238	3,270	N/A	3,516	3,654

* Estimated affordable tariff, assuming 5% of poverty line and water consumption of 120L/cap/day.

Source: JICA Study Team

The financial cash flows of each candidate project and the FIRRs are shown in Tables 4.5.1-3 through 4.5.1-7.

Table 4.5.1-3: Financial Cash Flows of Umbulan Project

(Unit: Rp billion in constant 2009 prices)

Year	Investment *1	Incremental O&M cost	Water tariff (Rp/m3)	Revenue from new water	Depreciation*2	Income tax*3	Net benefits
1	236						(236)
2	707						(707)
3	943						(943)
4	471						(471)
5		54	2,600	197	59	25	118
6		54	2,750	208	59	29	126
7		54	2,900	219	59	32	134
8		54	3,100	235	59	37	144
9		54	3,300	250	59	41	155
10		54	3,300	250	59	41	155
11		54	3,300	250	59	41	155
12		54	3,300	250	59	41	155
13		54	3,300	250	59	41	155
14		54	3,300	250	59	41	155
15		54	3,300	250	59	41	155
16		54	3,300	250	59	41	155
17		54	3,300	250	59	41	155
18		54	3,300	250	59	41	155
19		54	3,300	250	59	41	155
20		54	3,300	250	59	41	155
21		54	3,300	250	59	41	155
22		54	3,300	250	59	41	155
23		54	3,300	250	59	41	155
24		54	3,300	250	59	41	155
25		54	3,300	250	59	41	155
26		54	3,300	250	59	41	155
27		54	3,300	250	59	41	155
28		54	3,300	250	59	41	155
29		54	3,300	250	59	41	155
						FIRR (real terms)=	3.5%
						FIRR (nominal terms*4)=	9.7%

*1: Disbursement takes place in year 1 (10%), year 2 (30%), year 3 (40%), and year 4 (20%). No salvage value is expected at the
*2: Depreciation is straight line at 2.5% p.a. and tax deductible. No salvage value is taken into account at the end of project period, applying conservative policy.
*3: Income tax rate is assumed at 30%.
*4: Nominal FIRR is computed assuming that an inflation of 6% (annual inflation in May 2009) is applied throughout the project

Source: JICA Study Team

Table 4.5.1-4: Financial Cash Flows of Semarang Project

(Unit: Rp billion in constant 2009 prices)

Year	Investment *1	Incremental O&M cost	Water tariff (Rp/m3)	Revenue from new water	Depreciation*2	Income tax*3	Net benefits
1	70						(70)
2	211						(211)
3	281						(281)
4	141						(141)
5		12	2,700	27	18	-	15
6		13	2,900	31	18	0	18
7		13	3,100	35	18	1	21
8		14	3,300	39	18	2	23
9		15	3,300	41	18	3	24
10		16	3,300	43	18	3	25
11		16	3,300	45	18	3	26
12		17	3,300	47	18	4	27
13		18	3,300	50	18	4	28
14		19	3,300	52	18	5	28
15		19	3,300	54	18	5	29
16		20	3,300	56	18	5	30
17		21	3,300	58	18	6	31
18		21	3,300	60	18	6	32
19		22	3,300	62	18	7	33
20		23	3,300	64	18	7	34
21		24	3,300	66	18	7	35
22		24	3,300	66	18	7	35
23		24	3,300	66	18	7	35
24		24	3,300	66	18	7	35
25		24	3,300	66	18	7	35
26		24	3,300	66	18	7	35
27		24	3,300	66	18	7	35
28		24	3,300	66	18	7	35
29		24	3,300	66	18	7	35
						FIRR (real terms)=	0.3%
						FIRR (nominal terms*4)=	6.3%

*1: Disbursement takes place in year 1 (10%), year 2 (30%), year 3 (40%), and year 4 (20%).
*2: Depreciation is straight line at 2.5% p.a. and tax deductible. No salvage value is taken into account at the end of project period, applying conservative policy.
*3: Income tax rate is assumed at 30%.
*4: Nominal FIRR is computed assuming that an inflation of 6% (annual inflation in May 2009) is applied throughout the project

Source: JICA Study Team

Table 4.5.1-5: Financial Cash Flows of JABEKA Project

(Unit: Rp billion in constant 2009 prices)

Year	Investment *1	Incremental O&M cost	Water tariff (Rp/m3)	Revenue from new water	Depreciation*2	Income tax*3	Net benefits
1	564						(564)
2	1,691						(1,691)
3	2,254						(2,254)
4	1,127						(1,127)
5		206	2,500	513	141	50	257
6		324	2,500	807	141	103	380
7		442	2,500	1,100	141	155	503
8		442	2,500	1,100	141	155	503
9		442	2,500	1,100	141	155	503
10		442	2,500	1,100	141	155	503
11		442	2,500	1,100	141	155	503
12		442	2,500	1,100	141	155	503
13		442	2,500	1,100	141	155	503
14		442	2,500	1,100	141	155	503
15		442	2,500	1,100	141	155	503
16		442	2,500	1,100	141	155	503
17		442	2,500	1,100	141	155	503
18		442	2,500	1,100	141	155	503
19		442	2,500	1,100	141	155	503
20		442	2,500	1,100	141	155	503
21		442	2,500	1,100	141	155	503
22		442	2,500	1,100	141	155	503
23		442	2,500	1,100	141	155	503
24		442	2,500	1,100	141	155	503
25		442	2,500	1,100	141	155	503
26		442	2,500	1,100	141	155	503
27		442	2,500	1,100	141	155	503
28		442	2,500	1,100	141	155	503
29		442	2,500	1,100	141	155	503
						FIRR (real terms)=	6.0%
						FIRR (nominal terms*4)=	12.4%

*1: Disbursement takes place in year 1 (10%), year 2 (30%), year 3 (40%), and year 4 (20%).

*2: Depreciation is straight line at 2.5% p.a. and tax deductible. No salvage value is taken into account at the end of project period, applying conservative policy.

*3: Income tax rate is assumed at 30%.

*4: Nominal FIRR is computed assuming that an inflation of 6% (annual inflation in May 2009) is applied throughout the project period.

Source: JICA Study Team

Table 4.5.1-6: Financial Cash Flows of Bandung Project

(Unit: Rp billion in constant 2009 prices)

Year	Investment *1	Incremental O&M cost	Water tariff (Rp/m3)	Revenue from new water	Depreciation*2	Income tax*3	Net benefits
1	106						(106)
2	318						(318)
3	424						(424)
4	212						(212)
5		2	2,400	24	27	-	22
6		4	2,600	42	27	4	35
7		5	2,800	64	27	10	49
8		5	3,000	68	27	11	52
9		5	3,200	73	27	12	55
10		5	3,400	77	27	14	59
11		5	3,600	82	27	15	62
12		5	3,600	82	27	15	62
13		5	3,600	82	27	15	62
14		5	3,600	82	27	15	62
15		5	3,600	82	27	15	62
16		5	3,600	82	27	15	62
17		5	3,600	82	27	15	62
18		5	3,600	82	27	15	62
19		5	3,600	82	27	15	62
20		5	3,600	82	27	15	62
21		5	3,600	82	27	15	62
22		5	3,600	82	27	15	62
23		5	3,600	82	27	15	62
24		5	3,600	82	27	15	62
25		5	3,600	82	27	15	62
26		5	3,600	82	27	15	62
27		5	3,600	82	27	15	62
28		5	3,600	82	27	15	62
29		5	3,600	82	27	15	62
						FIRR (real terms)=	2.1%
						FIRR (nominal terms*4)=	8.3%

*1: Disbursement takes place in year 1 (10%), year 2 (30%), year 3 (40%), and year 4 (20%).

*2: Depreciation is straight line at 2.5% p.a. and tax deductible. No salvage value is taken into account at the end of project period, applying conservative policy.

*3: Income tax rate is assumed at 30%.

*4: Nominal FIRR is computed assuming that an inflation of 6% (annual inflation in May 2009) is applied throughout the project

Source: JICA Study Team

Table 4.5.1-7: Financial Cash Flows of Lampung Project

(Unit: Rp billion in constant 2009 prices)

Year	Investment *1	Incremental O&M cost	Water tariff (Rp/m3)	Revenue from new water	Depreciation*2	Income tax*3	Net benefits
1	58						(58)
2	174						(174)
3	232						(232)
4	116						(116)
5		19	3,500	33	15	-	14
6		19	3,800	36	15	1	16
7		19	4,200	40	15	2	19
8		19	4,600	44	15	3	22
9		19	5,000	47	15	4	24
10		19	5,000	47	15	4	24
11		19	5,000	47	15	4	24
12		19	5,000	47	15	4	24
13		19	5,000	47	15	4	24
14		19	5,000	47	15	4	24
15		19	5,000	47	15	4	24
16		19	5,000	47	15	4	24
17		19	5,000	47	15	4	24
18		19	5,000	47	15	4	24
19		19	5,000	47	15	4	24
20		19	5,000	47	15	4	24
21		19	5,000	47	15	4	24
22		19	5,000	47	15	4	24
23		19	5,000	47	15	4	24
24		19	5,000	47	15	4	24
25		19	5,000	47	15	4	24
26		19	5,000	47	15	4	24
27		19	5,000	47	15	4	24
28		19	5,000	47	15	4	24
29		19	5,000	47	15	4	24
						FIRR (real terms)=	0.0%
						FIRR (nominal terms*4)=	6.0%

*1: Disbursement takes place in year 1 (10%), year 2 (30%), year 3 (40%), and year 4 (20%).

*2: Depreciation is straight line at 2.5% p.a. and tax deductible. No salvage value is taken into account at the end of project period, applying conservative policy.

*3: Income tax rate is assumed at 30%.

*4: Nominal FIRR is computed assuming that an inflation of 6% (annual inflation in May 2009) is applied throughout the project

Source: JICA Study Team

We scored 3 to a project with an FIRR (real terms) of 6 – 12%. A project with an FIRR of more than 12% was given 2 points. If the FIRR was less than 6%, the score was 1 point. The rationale of such scoring is that a PPP project should be regarded socially responsible, meaning that consideration to the poor should be appreciated. When such consideration is incorporated into a PPP project, it becomes often difficult for the FIRR to reach sky-high. Thus, the highest score is given to the range of 6% to 12%. It should be noted that the FIRR is computed in real terms. If converted into nominal terms, the FIRR will be usually boosted by inflation rates. The 6% lower bound threshold was employed as it was estimated as the opportunity cost of capital for PPP projects[1].

1 The opportunity cost of capital is represented by the weighted average cost of capital (WACC). The WACC signifies the cost incurred by an implementation agency or a project operator in raising necessary capital to implement the project. Since many projects use several sources to raise capital and each of these sources seek a different return, the WACC represents a weighted average of the different returns paid to these sources. The WACC is used as a hurdle rate in assessing whether an FIRR stays at an appropriate level that can justify the implementation of the project. The FIRR should exceed the WACC for the project to be financially viable, otherwise the project would generate losses. In many of the F/S reports of the candidate projects, the WACCs are used as a discount rate in computing the NPVs. Those discount rates range between 10% and 20%, which are often customarily derived from an assumption that a cost of capital is about 12% at public funds and 18% at private funds, both of which are in nominal terms. This rationale seems to lack justification. We attempted to compute a justifiable WACC for PPP projects in Indonesia.

First, we consider BI rate as a fundamental interest rate. BI rate is set by Bank Indonesia (the Central Bank of Indonesia) as its benchmark overnight interest rate used as a vehicle in its monetary policy. BI rate was 7% per annum in June 2009. Four funding sources available to finance a PPP project are assumed to be (i) ODA loan, (ii) commercial loan, (iii) government fund (grant), and (iv) private fund.

One of ODA loans available for a water supply project in Indonesia in June 2009 was the JICA General Terms Loan for “Low-Income Countries”, which had an interest rate of 1.4% per annum. Commercial loans are available to some

6) EIRR

The EIRR is an indicator computed in economic analysis, by which economic profitability of a project is justified. The economic analysis is concerned with all participants in the economy and the benefits are the benefits to the entire society. The economic analysis uses economic prices, with financial prices adjusted to net out transfer payments including taxes, duties, or subsidies, and corrected for any other market distortions. For a project to be acceptable, the EIRR should be greater than the economic opportunity cost of capital, which is generally set at 12% in real terms. To identify project costs and benefits and to compare the net benefit flows, the without-project situation should be compared with the with-project situation. For simplicity, it is assumed that the without-project situation is the same as the before-project situation.

The EIRR was not used as a criterion at the first stage screening. This was because not all the F/S reports computed the project EIRR. Even presented, the EIRRs apparently lacked accuracy and comparability with each other. At the second stage screening, we attempted to estimate the EIRR of each project, using the same or comparable assumptions applicable to all projects. We confirmed that in all of the candidate project areas, the water demand is not met at present because of supply constraints and very high price of alternatives such as vendor supplied water and bottled water.

It is also assumed that the demand for the alternative water is suppressed to only 30% of total water use due to the high prices of alternative water. Therefore, 30% of the additional volume of water sold can be treated as non-incremental and valued at its opportunity cost, which is the average price of alternative water.

The remaining 70% of the additional water is considered incremental. Benefits from incremental water consumed can be valued at the users' willingness to pay, for which the average demand price can stand proxy. The average demand price can be approximated by the average of future and current costs of water supply to the users.

Commercial losses should be taken into account at the value of future water tariff. This is because the economic analysis deals with all participants in the economy, as such, the focus is on water consumed instead of water sold. Only

PDAMs which are of course, regarded financially healthy. In such a case the prevailing interest rate was BI rate plus 4 percentage points. Government funds or grants are not costless. They might be applied to purposes other than the project, such as debt repayment or to alternative investments. We assumed that the cost of government funds was the same as that of Treasury Note with a yield of 2 percentage points on top of BI rate. There is no established rule in estimating the cost of equity capital or return on equity (ROE) applied for water supply projects in Indonesia. We assumed that 10 percentage points plus BI rate would safely satisfy the ROE requirement.

Adjustment for corporate tax is also needed for the WACC calculation. Interest payments for loans used for operation are usually deductible for corporate tax purposes. The corporate tax rates were scheduled to decrease to 25% from 2010. We used this 25%, which also applied in computation of financial benefits of projects. The estimated costs of borrowing and equity capital should be adjusted for inflation to obtain the WACC in real terms. The year-on-year inflation in May 2009 was 6.0%. For foreign-sourced loans like Japanese ODA loan, we can consider that a premium for foreign exchange risk should be included in the WACC calculation. On the other hand, foreign-sourced funds are required to be adjusted for foreign inflation. To simplify the WACC calculation, it can be assumed that the foreign exchange risk premium offsets the prevailing foreign inflation rate. As such, neither of these factors need to be estimated and applied. Taking into account those conditions, we took a financing mix of ODA loan 50% and private fund 50%, resulting in 5.7% as the WACC.

technical losses are excluded from economic valuation. Key assumptions used in computing the EIRR are shown in Table 4.5.1-8. Other assumptions are explained subsequently.

Table 4.5.1-8: Assumptions Used in EIRR Computation

	Umbulan	Semarang	Jakarta, Bekasi, Karawang	Bandung	Lampung
New water production (liter/sec)	4,000	1,050	15,000	1,200	500
Project cost (Rp billion)	2,206.2	658.1	5,274.8	992.5	543.5
O&M cost (Rp billion/year)	50.2	4 to 7	193 to 413	2 to 5	17.7
Water source in served area					
Well water (%)	20%	20%	0%	20%	20%
Vendor supplied water (%)	10%	10%	0%	10%	10%
Treated (PDAM) water (%)	70%	70%	100%	70%	70%
of which, paid supply (%)	60%	60%	93%	60%	60%
of which, technical loss (%)	20%	20%	7%	20%	20%
of which, commercial loss (%)	20%	20%	0%	20%	20%
Well water cost (Rp/m3)	4,000	4,000	0	4,000	4,000
Vendor water cost (Rp/m3)	56,400	145,050	0	59,250	62,400
Average cost of alternative water (Rp/m3)	9,181 to 9,637	19,555 to 19,945	2,500	9,383 to 10,164	10,465 to 11,442

Source: JICA Study Team

- The project analysis is done in constant 2009 prices.
- The project investments will be implemented over 4 years.
- The economic life of the project is assumed to be 25 years after the implementation period. No residual values are assumed, making the analysis a conservative estimation of net benefits.
- The capital and O&M costs are apportioned into tradable and nontradable components. It is estimated that the tradable components account for 40% of the total cost and the remaining 60% are the nontradable components. Using the domestic price numeraire, financial prices will be reduced by 10% for duties and taxes. They are converted to economic prices by an estimated shadow exchange rate factor of 1.1 for the tradable component and 1.0 for the nontradable component. Applying all these factors, the conversion factor which can apply to conversion from the financial prices to the economic prices for the capital and O&M costs is computed at 0.936.

The economic cash flows of each candidate project and the EIRRs are shown in Tables 4.5.1-9 through 4.5.1-13. The EIRR of JABEKA project turned out to be 9.6%, which was much lower than other projects (17% to 30%). This is because a large part of economic benefit comes from economic price difference of currently expensive water and new inexpensive water. Such economic price difference is more salient in retail water (distribution) than in bulk water. We scored 3 to a project with an EIRR in real terms of more than 18%. A project with an EIRR of 12 – 18% was given 2 points. If the EIRR was less than 12%, the score was 1 point.

Table 4.5.1-9: Economic Cash Flows of Umbulan Project

(Unit: Rp billion in constant 2009 prices)

Year	Investment *1 *2	Incremental O&M cost *2	Benefit from non-incremental water use	Benefit from incremental water use	Benefit from commercial water loss	Net benefits
1	221					(221)
2	662					(662)
3	882					(882)
4	441					(441)
5		50	347	486	46	830
6		50	351	492	49	841
7		50	355	497	51	853
8		50	360	504	55	868
9		50	365	511	58	883
10		50	365	511	58	883
11		50	365	511	58	883
12		50	365	511	58	883
13		50	365	511	58	883
14		50	365	511	58	883
15		50	365	511	58	883
16		50	365	511	58	883
17		50	365	511	58	883
18		50	365	511	58	883
19		50	365	511	58	883
20		50	365	511	58	883
21		50	365	511	58	883
22		50	365	511	58	883
23		50	365	511	58	883
24		50	365	511	58	883
25		50	365	511	58	883
26		50	365	511	58	883
27		50	365	511	58	883
28		50	365	511	58	883
29		50	365	511	58	883
					EIRR (real terms)=	27.6%

*1: Disbursement takes place in year 1 (10%), year 2 (40%), year 3 (30%), and year 4 (20%).
*2: Conversion factor to economic prices is assumed to be 0.936.

Source: JICA Study Team

Table 4.5.1-10 Economic Cash Flows of Semarang Project

(Unit: Rp billion in constant 2009 prices)

Year	Investment *1 *2	Incremental O&M cost *2	Benefit from non-incremental water use	Benefit from incremental water use	Benefit from commercial water loss	Net benefits
1	66					(66)
2	197					(197)
3	263					(263)
4	132					(132)
5		11	99	138	6	232
6		12	106	148	7	250
7		13	112	157	8	266
8		13	119	167	9	282
9		14	125	175	10	296
10		15	131	184	10	310
11		15	137	192	11	324
12		16	143	201	11	339
13		17	150	210	12	354
14		17	156	218	12	369
15		18	162	227	13	384
16		19	169	236	13	399
17		19	175	244	13	413
18		20	180	253	14	427
19		21	186	261	14	441
20		21	192	269	15	455
21		22	198	277	15	469
22		22	198	277	15	469
23		22	198	277	15	469
24		22	198	277	15	469
25		22	198	277	15	469
26		22	198	277	15	469
27		22	198	277	15	469
28		22	198	277	15	469
29		22	198	277	15	469
					EIRR (real terms)=	29.8%

*1: Disbursement takes place in year 1 (10%), year 2 (40%), year 3 (30%), and year 4 (20%).
*2: Conversion factor to economic prices is assumed to be 0.936.

Source: JICA Study Team

Table 4.5.1-11 Economic Cash Flows of JABEKA Project

(Unit: Rp billion in constant 2009 prices)

Year	Investment *1 *2	Incremental O&M cost *2	Benefit from non-incremental water use	Benefit from incremental water use	Benefit from commercial water loss	Net benefits
1	527					(527)
2	1,582					(1,582)
3	2,110					(2,110)
4	1,055					(1,055)
5		193	0	513	0	320
6		303	0	807	0	503
7		413	0	1,100	0	686
8		413	0	1,100	0	686
9		413	0	1,100	0	686
10		413	0	1,100	0	686
11		413	0	1,100	0	686
12		413	0	1,100	0	686
13		413	0	1,100	0	686
14		413	0	1,100	0	686
15		413	0	1,100	0	686
16		413	0	1,100	0	686
17		413	0	1,100	0	686
18		413	0	1,100	0	686
19		413	0	1,100	0	686
20		413	0	1,100	0	686
21		413	0	1,100	0	686
22		413	0	1,100	0	686
23		413	0	1,100	0	686
24		413	0	1,100	0	686
25		413	0	1,100	0	686
26		413	0	1,100	0	686
27		413	0	1,100	0	686
28		413	0	1,100	0	686
29		413	0	1,100	0	686
					EIRR (real terms)=	9.6%

*1: Disbursement takes place in year 1 (10%), year 2 (40%), year 3 (30%), and year 4 (20%).
*2: Conversion factor to economic prices is assumed to be 0.936.
Source: JICA Study Team

Table 4.5.1-12: Economic Cash Flows of Bandung Project

(Unit: Rp billion in constant 2009 prices)

Year	Investment *1 *2	Incremental O&M cost *2	Benefit from non-incremental water use	Benefit from incremental water use	Benefit from commercial water loss	Net benefits
1	99					(99)
2	298					(298)
3	397					(397)
4	198					(198)
5		2	46	65	6	115
6		3	78	109	10	193
7		5	109	153	15	273
8		5	111	155	16	278
9		5	112	157	17	282
10		5	114	159	18	287
11		5	115	162	19	291
12		5	115	162	19	291
13		5	115	162	19	291
14		5	115	162	19	291
15		5	115	162	19	291
16		5	115	162	19	291
17		5	115	162	19	291
18		5	115	162	19	291
19		5	115	162	19	291
20		5	115	162	19	291
21		5	115	162	19	291
22		5	115	162	19	291
23		5	115	162	19	291
24		5	115	162	19	291
25		5	115	162	19	291
26		5	115	162	19	291
27		5	115	162	19	291
28		5	115	162	19	291
29		5	115	162	19	291
					EIRR (real terms)=	19.1%

*1: Disbursement takes place in year 1 (10%), year 2 (40%), year 3 (30%), and year 4 (20%).
*2: Conversion factor to economic prices is assumed to be 0.936.
Source: JICA Study Team

Table 4.5.1-13: Economic Cash Flows of Lampung Project

(Unit: Rp billion in constant 2009 prices)

Year	Investment *1 *2	Incremental O&M cost *2	Benefit from non-incremental water use	Benefit from incremental water use	Benefit from commercial water loss	Net benefits
1	54					(54)
2	163					(163)
3	217					(217)
4	109					(109)
5		18	50	69	8	109
6		18	50	71	8	112
7		18	52	72	9	116
8		18	53	74	10	119
9		18	54	76	11	123
10		18	54	76	11	123
11		18	54	76	11	123
12		18	54	76	11	123
13		18	54	76	11	123
14		18	54	76	11	123
15		18	54	76	11	123
16		18	54	76	11	123
17		18	54	76	11	123
18		18	54	76	11	123
19		18	54	76	11	123
20		18	54	76	11	123
21		18	54	76	11	123
22		18	54	76	11	123
23		18	54	76	11	123
24		18	54	76	11	123
25		18	54	76	11	123
26		18	54	76	11	123
27		18	54	76	11	123
28		18	54	76	11	123
29		18	54	76	11	123
					EIRR (real terms)=	17.2%

*1: Disbursement takes place in year 1 (10%), year 2 (40%), year 3 (30%), and year 4 (20%).
*2: Conversion factor to economic prices is assumed to be 0.936.

Source: JICA Study Team

7) Capital Cost

Capital costs means practically initial investment costs, composed of infrastructure facilities to be constructed during the project implementation period. The capital cost is particularly influential in generating cash outflows at the early stage of project operation period. From the viewpoints of a positive investor, a project of high capital cost tends to be preferable. Our scoring principle was that the higher the capital cost, the better. A project with its capital cost of more than Rp 2,000 billion was given 3 points. If the capital cost would be between Rp 1,000 and 2,000 billion, we scored it 2 points. If the capital cost would be less than Rp 1,000, the score was 1 point.

8) Production capacity

The production capacity is a key technical criterion when the size of a water supply project is evaluated. The scoring principle is that the bigger the production capacity, the better. This criterion was used also at the first stage screening, but thresholds used in the scoring rule were scaled up from ones used at the first stage screening. A project with a planned size of production capacity is 5,000 L/sec (liter per second) or more is given 3 points. If 1,000 – 4,999 L/sec, the score is 2 points. If less than 1,000 L/sec, 1 point is given.

9) Raw water securement

Securing raw water required for a candidate project is an important criterion. In June 2009, no project had obtained the water rights deed or official documents in

which use of raw water was mentioned. This was not surprising as all candidate projects were still at the study stage. To confirm the level of raw water securement, we interviewed competent local government authorities which would approve the raw water use when the projects were to be implemented. As a result of the data confirmation activities, we scored 3 points to a project whose raw water requirement was considered to be 100% secured in June 2009. Two points were given to a project if such likeliness was 70 – 99%. One point was given in case of less than 70%.

10) Technical risk/ readiness

Technically serious risks were not found during check of the F/S reports of each candidate project. Interviews with local government officials and engineering consultants did not suggest any particular technical risk either. We decided to evaluate technical risk and readiness of a project implementation by an expected period required to start the design and construction. The scoring principle is that the shorter the preparation period, the better. We score 3 points to a project which could immediately start the design and construction on condition that the funds are available. If the preparation period will be one to three years, the score is 2 points. If the preparation period will be four years or more, 1 point.

11) Government consensus

In Indonesia, authority for all aspects of local water supply infrastructure and service delivery, including planning, providing, financing, and managing water supply has been devolved from the central government to local governments since 1999. However, the candidate projects are classified into either inter-provincial, inter-district/city, or intra-district/city project. Therefore, depending on the type of geographical coverage, the project has to be scrutinized and given various approvals at several governmental levels, such as raw water allocation, organization permit, and procurement. Naturally none of the candidate projects have obtained all the necessary approvals for implementation in June 2009. To assess the level of government consensus for the project, we interviewed competent government authorities possibly involved in the project. Based on the findings, we scored 3 points if the consensus for project implementation among relevant governments and PDAMs appeared to be almost established. Two points were given if the consensus building looked halfway through. If the consensus building was still far-off, 1 point was given.

12) PDAM performance

Financial viability of a water supply project is affected by performance of PDAM in the project area in several ways. Most of the candidate projects included a component of improving or expanding the water distribution system. In this case, the PDAM in the project area was most likely to keep being charged with the water distribution role. If the project was a bulk water supply project, the PDAM in the project area was likely to be a buyer of water produced by the project. Thus, the performance of the PDAM was again important.

To know the PDAM’s performance in recent years, we used the result of a benchmarking program. BPP SPAM has been conducting a nationwide

benchmarking program on about 300 PDAMs nationwide. The results are made public through the annual report. The overall performance score of PDAM introduced in the report comprises three levels, “healthy”, “less healthy”, and “unhealthy”. We gave our MCA score of 3 points to a “healthy” PDAM, 2 points to a “less healthy” PDAM, and 1 point to an “unhealthy” PDAM.

13) Impact on living environment

We originally tried to measure the degree of adverse impacts by means of the expected number of project affected people. However the F/S reports of candidate projects made little mention of such impacts. This was understandable because water supply projects tend to have less adverse impacts compared with other infrastructure projects such as sewerage, road, and railway. In order to check if such adverse impact would be caused by a project, we used information obtained by direct enquiries or interviews with project stakeholders. When a project’s potential adverse impact on living environment was considered to be very limited and negligible, the highest 3 points were given. If the impact on living environment was likely to exist but overcomable by compensation and communication, we scored 2 points to the project. If the impact was likely to be significant and take time for solution, the score was 1 point.

14) Land acquisition

The majority of water supply projects involve acquisition of lands that are owned or utilized by individuals and communities. The difficulty accompanying the land acquisition is such that the project may be long overdue or even the project itself may be stopped. To check the difficulty of land acquisition, we used information obtained through direct enquiries or interviews with project stakeholders. The highest 3 points were given if timeframe for remaining land acquisition was expected to be less than a year provided that reasonable budget for land acquisition based on market price had been appropriated. If such expected timeframe for remaining land acquisition was 1 to 3 years, two points were given. If the timeframe was more than 3 years, the score was 1 point.

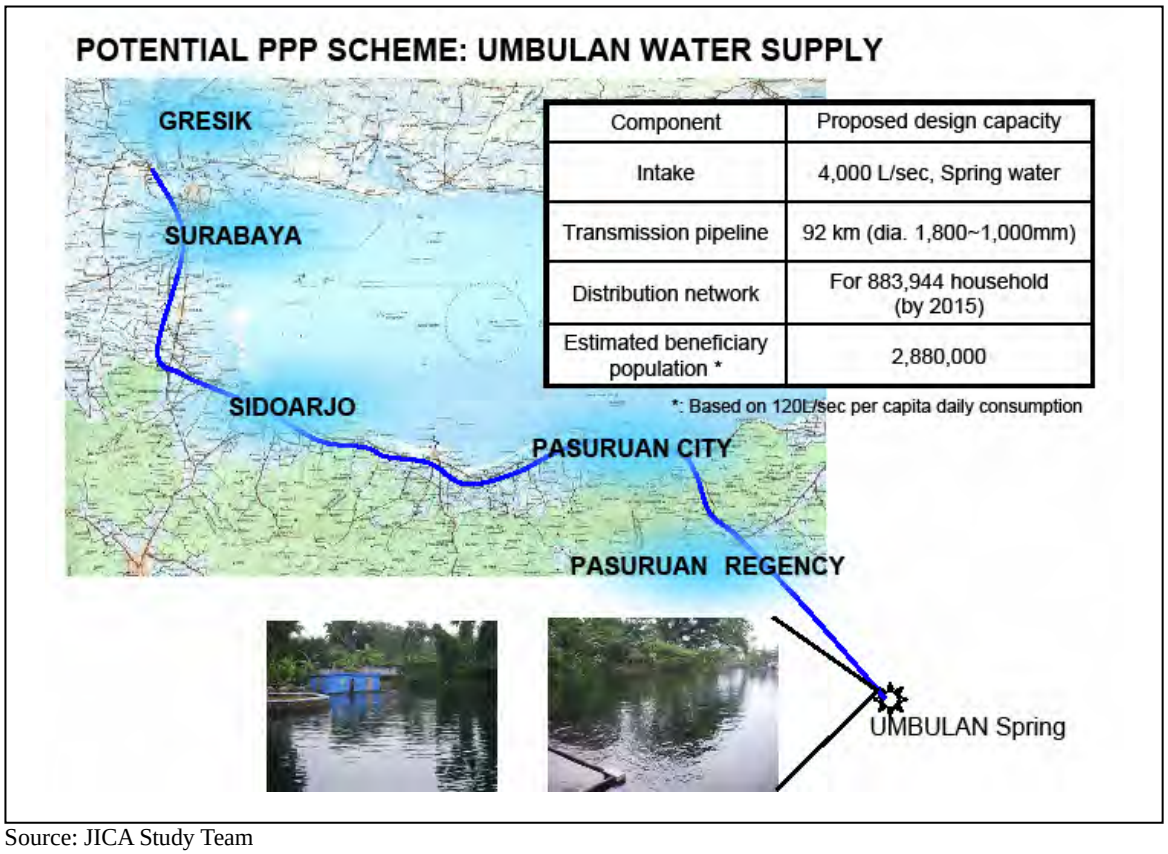
4.5.2 Findings of Field Investigations

Through the field investigations, backgrounds of each project became clearer. We also confirmed that Umbulan bulk water project had been incorporated into Umbulan bulk and distribution project. Consequently the MCA at the second stage screening was to be performed for five projects, (1) Umbulan (2) Semarang, (3) Jakarta-Bekasi-Karawang (4) Lampung and (5) Bandung. Findings of the field investigations for these five projects are summarized in subsequent paragraphs.

1) Umbulan Project

The project has three physical components, comprising: (i) Intake 4000 l/sec. to supply Pasuruan city (110.87 l/sec.), Pasuruan Regency (420.86 l/sec.), Sidoardjo (1,369 l/sec.), Gresik (1,000 l/sec.), and Surabaya (1,000 l/sec.); (ii) transmission pipe totally 92km which is divided into four sections: Umbulah-Pohjentrek (dia. 1,800mm, L=20km), Pohjentrek-Porong (dia.

1,700mm, L=24km), Porong-Waru (dia. 1,400mm, L=22km), Waru-Gresik (dia. 1,000mm, L=26km); and (iii) Distribution to provide 883,944 household connections by 2015. The estimated beneficiary population is 2,880,000, on the basis of 120 l/sec per capita daily consumption. The estimated investment costs total to Rp 2,357 billion, composed of (i) intake (Rp 120 billion), (ii) transmission pipe (Rp 1,377 billion), and (iii) distribution network (Rp 860 billion). The project map which indicates key facility locations is shown in Figure 4.5.2-1.



Source: JICA Study Team

Figure 4.5.2-1: Map of Umbulan Project

Water of Umbulan spring is abundant and clean. According to measurement conducted from 1987 to 2004, Umbulan spring water yield ranged between 4,567 and 5,900 liter per second. In 2007 measurement, it was between 4,125 and 4,515 liter per second.

The spring water needs only a simple chlorination in order to use for drinking purposes. Thus a large-scaled water supply project which uses the spring water was first designed back in 1980's. Several F/S were conducted. And even a concession was put out to tender in 1990's. All these attempts resulted in failure because of various financial, legal, and political problems. The latest F/S was conducted in 2007 by World Bank. But again, financial problems of local governments and PDAMs hindered the project implementation.

Three key issues should be sorted out for smooth project implementation, which are (i) assurance for financing the distribution system improvement and expansion of each PDAM, (ii) coordination and consensus building among the municipalities and regencies involved in this inter-municipal project, and (iii) compensation settlement claimed by the Pasuruan Regency for use of the spring

water despite the fact that the water right belongs to the East Java Province.

Financing problem comes from the fact that the improvement and expansion of distribution system of 5 PDAMs (Pasuruan City, Pasuruan Regency, Sidoarjo, Gresik, and Surabaya) should be carried out in tandem with augmentation of bulk water supply to the PDAMs. Otherwise, when new water supplied from the spring is made available to the PDAMs, the water cannot be distributed fully and efficiently to end users. The expansion and improvement of distribution networks is expected to be financed by on-lent loan from the local government of East Java, which will be in turn, on-lent by MoF, funds like Japanese ODA loan. To use the on-lent loan from the local government, each PDAM has to be financially sound. Financially unsound PDAM have to get its financial restructuring plan approved by MoF.

Currently PDAM Surabaya, PDAM Sidoarjo, and PDAM Gresik are regarded sound as they have a stable customer base and charge relatively higher water tariff, while PDAM Pasuruan City and PDAM Pasuruan Regency are weak as they are charging low water tariffs insufficient to cover their debt service. These two PDAMs however, have already submitted the financial restructure plan to MoF, which is expected to be approved. Considering the above situations, there is every chance that the five PDAMs will get on-lent loan from the local government.

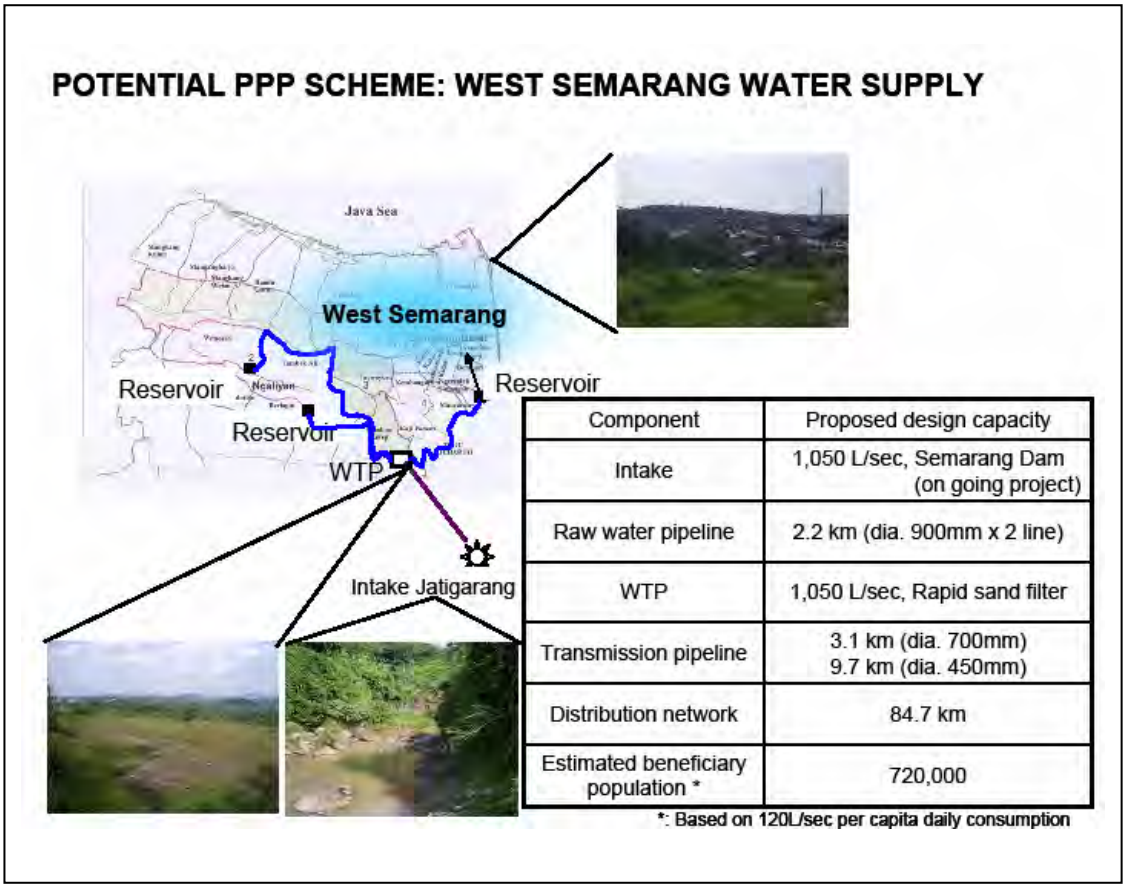
Inter-municipal coordination by a provincial authority is generally an issue when plural municipalities are involved in a development project. In case of Umbulan project where five municipalities and regencies are involved, there is a PDAB (provincial water supply company), which is already established to provide bulk water to various PDAMs in the East Java Province. However when it comes to water distribution to the service area of each PDAM, it is each PDAM or local government who decide and finance the investment. Because of the project nature where the bulk water from a single intake point is transmitted systematically from one municipality to another, objection of one PDAM or local government can halt the entire operation. Currently CIPTA KARYA plays an important role in coordinating and guiding the 5 PDAMs and the local governments towards the consensus building. Unreliable water demand forecast and finance planning for distribution network improvement by the PDAMs are being corrected under guidance of CIPTA KARYA.

The issue of water right and compensation to Pasuruan Regency has been a problem for many years. Legally the water right of Umbulan Spring belongs to the East Jave Province where the competent water catchment area embraces the spring. Pasuruan Regency claims compensation however, on the grounds that the spring water yielding point is within the regency territory. This issue of water right and compensation is currently being mediated by CIPTA KARYA, thus they are likely to come to a settlement in not so remote future.

2) Semarang Project

The Semarang project has five physical components, comprising: (i) intake facility 1,050 l/sec; (ii) raw water conveyance pipe dia. 900mm, L=2.2km two lines; (iii) Water Treatment Plant 1,050 l/sec.; (iv) main transmission pipe dia.

700 with L=3.1km and dia. 450mm with L=9.7km; and (v) distribution system including distribution reservoir and distribution pipe 84.7km, serving to an estimated population of 720,000, on the basis of 120 l/sec per capita daily consumption. The estimated investment costs total to Rp 703 billion, composed of (i) intake, WTP and transmission (Rp 640 billion) and (ii) distribution system (Rp 64 billion). The project map which indicates key facility locations is shown in Figure 4.5.2-2.



Source: JICA Study Team

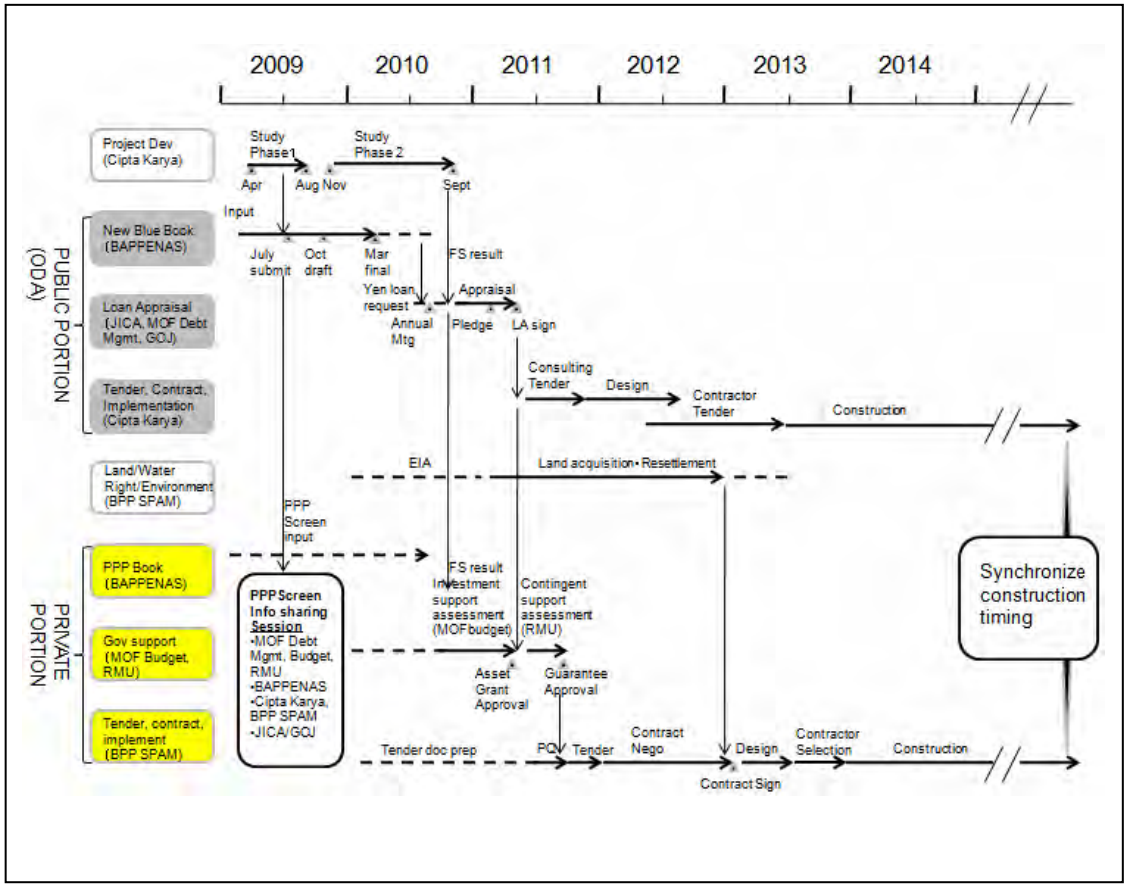
Figure 4.5.2-2: Map of Semarang Project

The Semarang project is the highest priority project in the region and it is included in the strategic sector plan. The West Semarang project was prepared to utilize the water to be made available at Jatigarang dam, a flood control facility located in Semarang Municipality. The existing raw water for Semarang Municipality is taken from Purwodadi (Kudu) that is located outside of Semarang Municipality and the intake quantity is also insufficient. The Semarang project is expected to solve the existing water shortage problem and at the same time to reduce ground water utilization and land subsidence in Semarang.

Two main issues should be clarified for smooth implementation as a PPP project, which are (i) timing of construction of the upstream dam, and (ii) financing.

Firstly, the timing of construction of the upstream dam will not be a problem. In June 2009, the construction of the dam was in contractor tendering process. The construction of the dam is scheduled to be complete in 2013. After one year of

water-filling, the dam will become operable for raw water supply from 2014. We assume that our standard PPP schedule (Figure 4.5.2-3) will start the facility construction in 2013. Therefore it is very likely that the dam will be complete and the raw water will have become available when the facility of Semarang water project gets completed.



Source: JICA Study Team

Figure 4.5.2-3 : Water Supply "Section Split" PPP Schedule

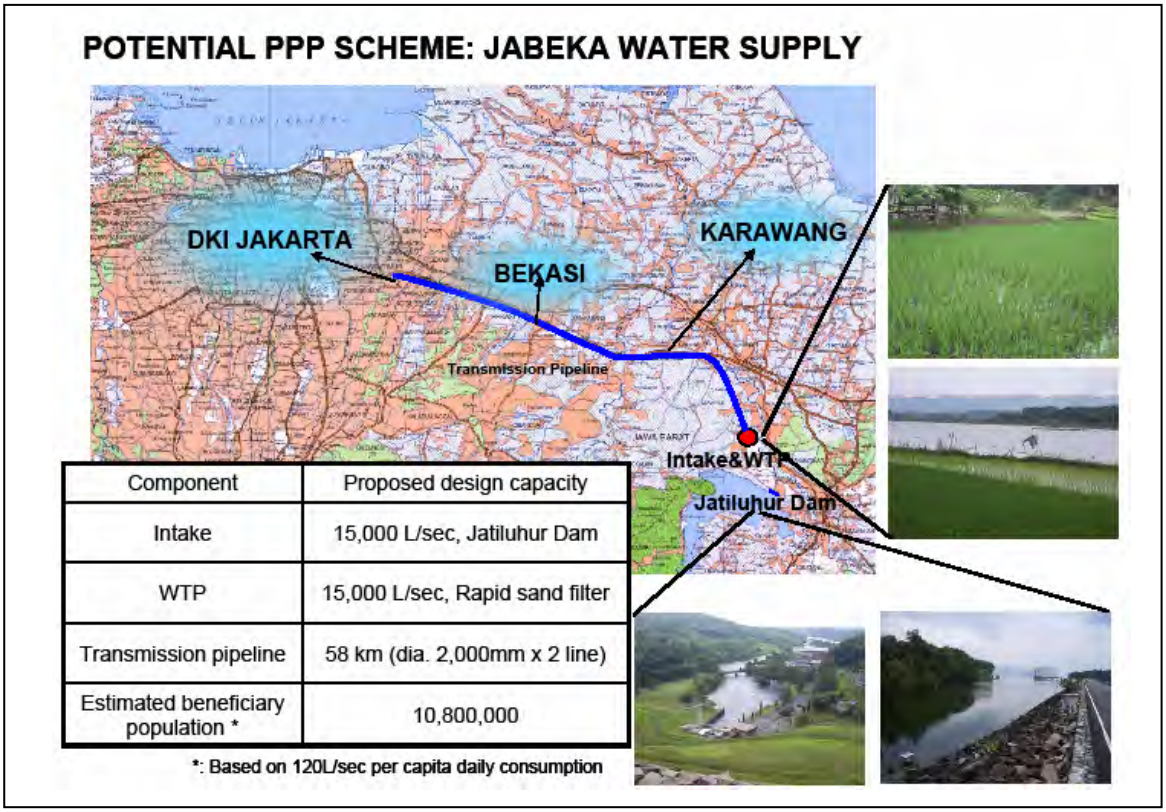
Secondly, the financing issue is whether this project should be financed by a PPP scheme. The construction of the dam is already decided to be financed by a Japanese ODA loan. The implementation agency of the dam project will be Water Management Center (Balai Besar) of Pamali-Juana. The Semarang water project is scheduled to finish its detail design in early 2010, funded by the Japanese ODA loan, as part of the dam project. But the funding source for the Semarang project itself is yet to be decided. There is a possibility that the Semarang water project will be also financed by a Japanese ODA loan. Because it will look awkward if the dam project (flood control project) will be complete and the water supply project, which is considered as part of the dam project, will be incomplete. However, whether the government of Indonesia solicits a loan to JICA and whether JICA approves the loan, are uncertain.

PDAM Semarang wants to proceed with the Semarang project by receiving grants from GoI, using an on-lent loan from the local government of Semarang, or giving a concession to private sector. It is surely impossible for PDAM Semarang itself to finance the Semarang project by its own fund under the current financial standing. PDAM Semarang has been continuously loss-making and its debts to GoI have amounted to Rp 270 billion. However PDAM Semarang, led by new management since this year, has submitted the financial restructure plan to MoF. If this plan is approved, it may be possible for MoF to onlend Japanese ODA loan to the local government of Semarang which in turn, onlends the fund to PDAM Semarang. Also there is a Japanese company who

showed interest in contracting UFW (unaccounted-for water) reduction work of the Semarang distribution network. It is not certain however, the Japanese company and PDAM Semarang come to any agreement.

3) JABEKA Project

The project has two physical components, comprising: (i) Water Treatment Plant 15,000 l/sec. to supply bulk water for DKI Jakarta (12,750 l/sec.), Bekasi Regency (500 l/sec.), Bekasi City (500 l/sec.), and Karawang regency (500 l/sec.); (ii) transmission pipe 58km with diameter 2,000mm two lines. The project plans to provide treated water to PAM JAYA and two PDAMs who are in turn expected to serve an estimated population of 10.8 million based on 120 l/sec per capita daily consumption. The estimated investment costs total to Rp 5,635 billion, composed of (i) water treatment plant (Rp 1,623 billion), and (ii) transmission pipe (Rp 3,513 billion). The project map which indicates key facility locations is shown in Figure 4.5.2-4.



Source: JICA Study Team

Figure 4.5.2-4: Map of JABEKA Project

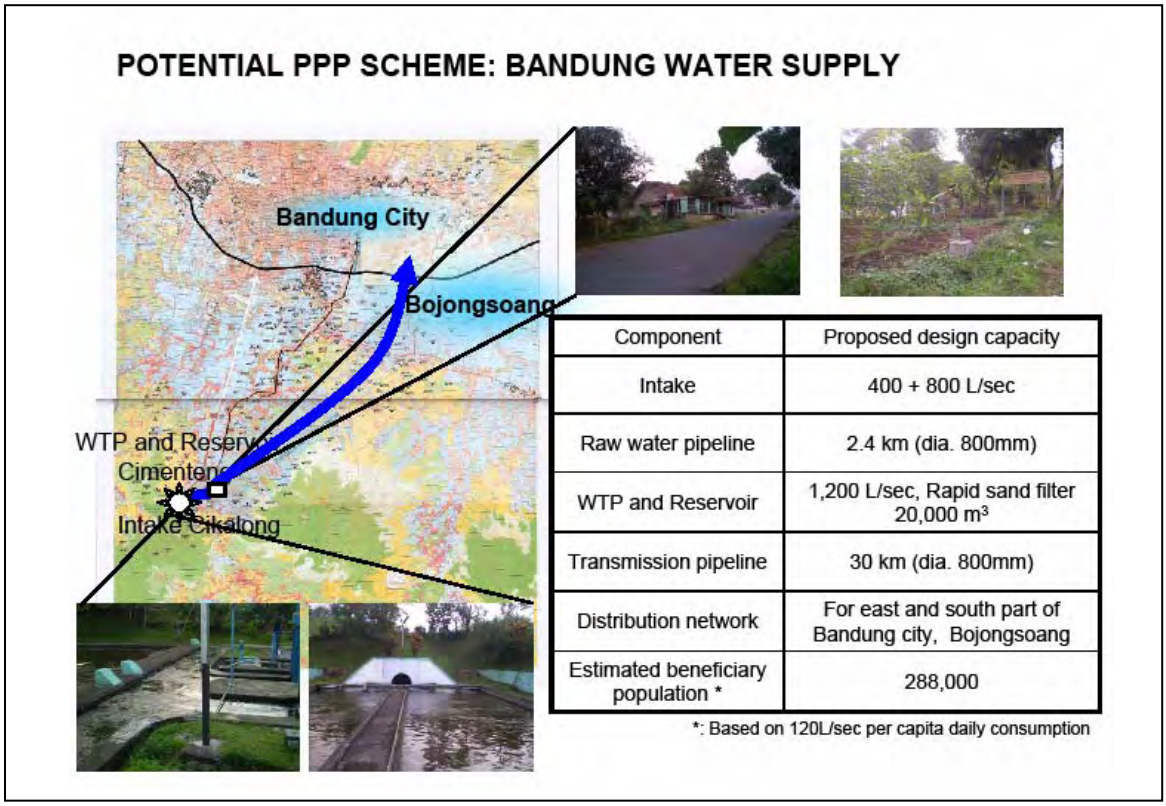
Population increase and economy development at Jakarta metropolitan area, such as DKI Jakarta, Bekasi and Karawang, is increasing people's needs for clean water. On the other hand, high population density in DKI Jakarta and few availability of piped water facility in the metropolitan area make people to use groundwater as alternative way to meet the water needs. As a result, groundwater consumption has reached such a high level that the local governments cannot control easily. The high groundwater consumption causes decreasing of groundwater, land subsidence and seawater intrusion. Under these circumstances, providing additional water to DKI Jakarta and its surrounding area has become a matter of the utmost importance.

A key issue that should be clarified for smooth project implementation is a possibility that the project may become inappropriate for an ODA based scheme. There are two factors that could raise such concern.

Firstly, this project is a bulk water supply project, thus the clients who buy the bulk water is PAM JAYA. PAM JAYA, in turn sells the water to end users. However, there are two private companies, PT PALYJA and PT AETRA, both of which are concessionairs of water distribution in Jakarta. Both PT PALYJA and PT AETRA are a SPC established by non-Japanese private companies. They are in charge of providing water distribution services to and tariff collection from end users. Naturally BT PALYJA and PT AETRA cannot be a borrower or user of Japanese ODA funds.

Secondly, in June 2009, there was a possibility that the procurement would be done by direct appointment, instead of tender process. The direct appointment can be made possible by an unauthorized interpretation of the Government Regulation Number 16/2006. This is still possibility and there is also a high possibility that this project will follow usual tender process which is acceptable as a Japanese ODA based project.

4) Bandung Project



Source: JICA Study Team

Figure 4.5.2-5: Map of Bandung Project

The project has five physical components, comprising: (i) intake at Cikalong and raw water conveyance pipe; (ii) Water Treatment Plant 1,200 l/sec.; (iii) reservoir 20,000 m3; (iv) transmission pipe; and (v) Distribution to east part of Bandung City, south part of Bandung city and Bojongsoang district at Bandung regency, serving an estimated population of 288,000 on the basis of 120 liter/sec

per capita daily consumption. The currently available intake capacity is 400 l/sec and another 800 l/sec is expected only when a raw water conduit tunnel from Cisangkuy River is constructed. The estimated investment costs total to Rp 1,049 billion. The breakdown is (i) intake and raw water conveyance pipe (Rp 3 billion), (ii) WTP (Rp 242 billion), (iii) reservoir (Rp 55 billion), (iv) transmission pipe (Rp 437 billion), and (v) distribution (Rp 312 billion).

The project map which indicates key facility locations is shown in Figure 4.5.2-5.

It was found that the project scope of Bandung city water supply project stated in Pre F/S was changed, in which the capacity of raw water taking from Cikalong intake decreased from 1,050 l/sec to 400 l/sec. However, an economically payable capacity is said to be about 1,200 l/s. Because of this raw water problem, Bandung City water supply plan abandoned the idea of using existing raw water transmission pipe and treated water transmission pipe of 800 mm and 900 mm diameter. Instead the plan opted to construct new transmission pipe. Also the service area was changed from the area of Bojongsoang, and east and west part of Bandung,to Gedebage development area only.

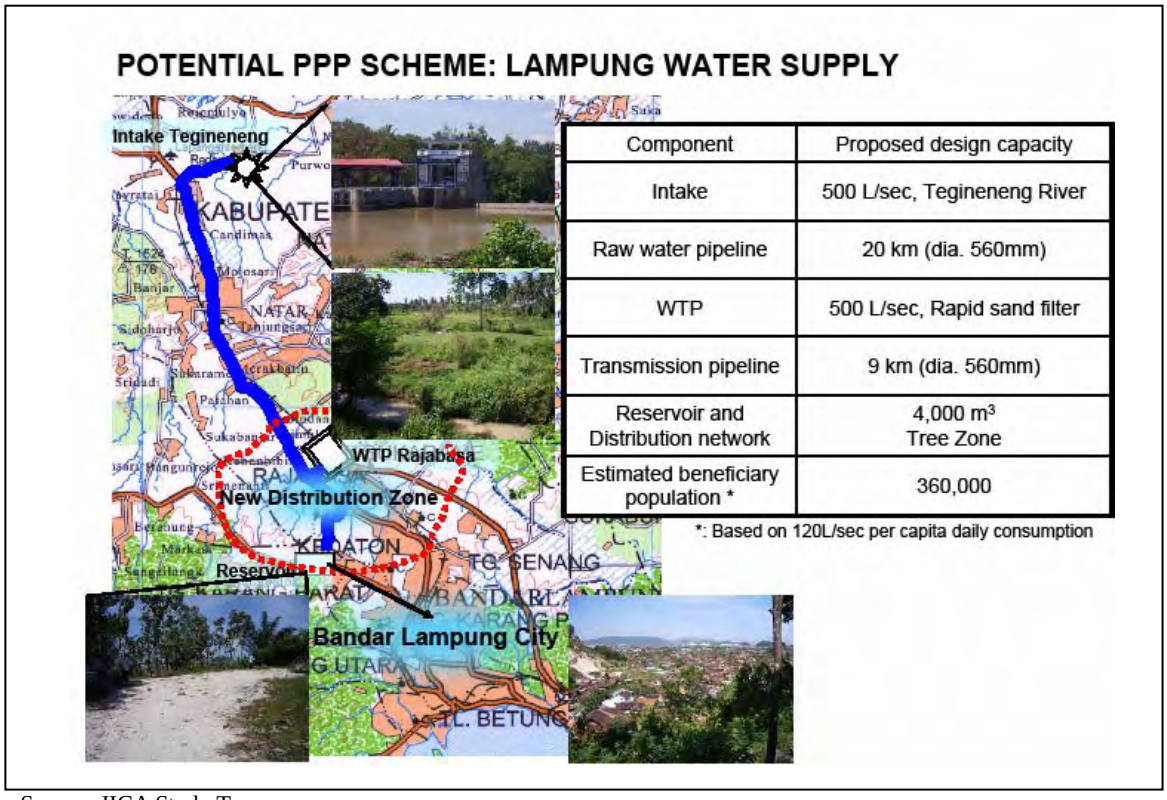
According to information from West Java Province PU water resources, raw water supply for Bandung city and area surrounding Bandung will be about 1,400 l/sec in 2014 after constructing tunnel connection from Cilaki River to Cisangkuy River and Sentosa dam at upstream area of Bandung. The construction project is listed on the Blue Book of Bappenas and it is said that the World Bank may finance it. However, without construction of the tunnel and dam, Cisangkuy River can only have an raw water intake capacity of 400 l/sec, which is available for Bandung water supply. In order to tackle the raw water shortage problem, a consultant of Bappeda Bandung City prepared a scenario for Bandung City Water Supply with constructing WTP Cimenteng with capacity 1,200 l/sec., by constructing a WTP by three stages (3 x 400 l/sec.). Stage 1 period is planned in 2010 – 1013. However there has not even been a workable F/S for the scenario. Thus the Bandung side expected that the fund would be made available under a PPP scheme.

5) Lampung Project

The Project has five physical components, comprising: (i) intake facility 500 l/sec; (ii) raw water conveyance pipe dia. 560mm with L=20km; (iii) Water Treatment Plant 500 l/sec.; (iv) transmission pipe dia. 560mm with L=9km; and (v) distribution system including reservoir 4,000 m3 and distribution network at three zones, serving an estimated population of 360,000 on the basis of 120 l/sec per capita daily consumption. The estimated investment costs total to Rp 581 billion, composed of (i) intake (Rp 1 billion), (ii) raw water conveyance pipe (Rp 258 billion), (iii) WTP (Rp 86 billion), (iv) transmission pipe (Rp 116 billion), and (v) reservoir and distribution network (Rp 1184 billion).

The project map which indicates key facility locations is shown in Figure 4.5.2-6.

This is a relatively small and simple project in a sense that the project will be completed within a single province and the served area is a single municipality. Part of this project, development of Weir Sekampung and Weir Sabu for raw water supply to Lampung water system is listed on Regional Mid-term Development Plan. It is said that the finance for the intake facility and raw water transmission pipe to WTP may be budgeted by the Water Resources Dept. of MPW. Our PPP scheme proposal assumes that this finance can be replaced by private funds so as to secure a minimal satisfactory amount for private participation.



Source: JICA Study Team

Figure 4.5.2-6 : Map of Lampung Project

4.5.3 Results of Second Stage Screening

The results of the second stage screening are summarized in Table 4.5.3-1. The projects were placed in the order of score as Umbulan, Semarang, JABEKA, Lampung, and Bandung. We decided to loyally select the three highest score projects, (1) Umbulan (2) Semarang, and (3) JABEKA as finalist.

Table 4.5.3-1: MCA Result of Second Stage Screening

Evaluation Criteria		Umbulan	Semarang	DKI Jakarta-Bekasi-Karawang	Bandung Regency	Bandar Lampung
1) Necessity 20%	1.1) Growth of per capita GRDP (Data, %)	2 (14.24)	2 (12.20)	2 (13.20)	3 (23.60)	3 (16.20)
	1.2) Capital cost magnitude in GRDP (Data, %)	2 (1.04)	3 (2.30)	1 (0.96)	2 (1.74)	3 (5.56)
	1.3) Distribution component (Data, %)	3 (36)	3 (44)	1 (0)	2 (29)	2 (20)
	1.4) Pro-poor consideration (Data, %)	2 (18.51)	2 (19.23)	1 -	2 (13.01)	3 (20.98)
	Necessity score	2.25	2.50	1.25	2.25	2.75
2) Profitability 35%	2.1) FIRR (Data, %)	1 (3.8)	1 (0.5)	3 (6.4)	1 (2.4)	1 (0.2)
	2.2) EIRR (Data, %)	3 (27.6)	3 (29.8)	1 (9.6)	2 (19.1)	2 (17.2)
	2.3) Capital cost (Data, Billion Rp.)	3 (2,357)	2 (703)	3 (5,135)	2 (1,049)	1 (581)
	2.4) Production capacity (Data, L/sec)	2 (4,000)	2 (1,050)	3 (15,000)	1 (400)	1 (499)
	Profitability score	2.14	1.86	2.71	1.43	1.14
3) Implementability 45%	3.1) Raw water securement	2	2	2	1	3
	3.2) Technical risk / Readiness	2	2	2	2	2
	3.3) Government consensus	2	3	2	3	3
	3.4) PDAM performance	2.58*	1	1.75**	1	1
	3.5) Impact on living environment	2	2	2	2	1
	3.6) Land acquisition	3	3	3	3	2
	Implementability Score	2.18	2.22	2.08	2.00	2.22
	Overall Score	2.18	2.15	2.14	1.85	1.95

Note: * the point avarage out at the point of 5 PDAMs, (Pasuruan Regency: 1 point, Pasuruan City: 1 point, Sidoarjo: 1point, Surabaya: 3 points, Gresik: 1 point.)

** the point avaraged out at the point of 3 PDAMs (Bekasi: 3 points, Karawang: 3 points, Jakarta: 1point)

Source: JICA Study Team

4.6 PPP Scheme Proposal

In this section, we propose a potential PPP scheme for each of the selected projects. The proposed schemes are further analyzed for their SPC IRRs to be at an acceptable level for participation of private investors.

4.6.1 Potential PPP Scheme

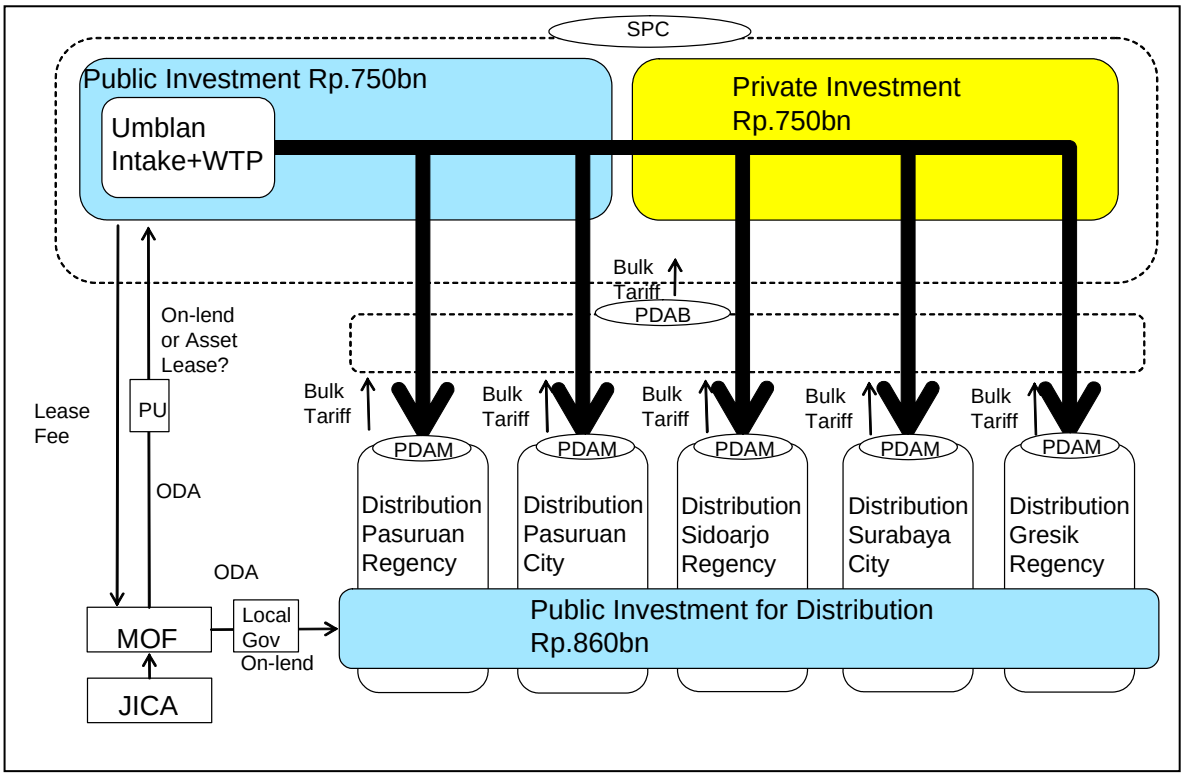
A potential PPP scheme we propose for Umbulan project is shown in Figure 4.6.1-1, followed by one for Semarang project (Figure 4.6.1-2) and for JABEKA project (Figure 4.6.1-3) Since each scheme is made under our rough estimated, a combination of ODA potion and SPC potion may be modified on the next feasibility study.

1) Umbulan Project

The proposed Umbulan PPP scheme is comprised of three components, which are (i) BOT bulk water supply operation by private investors, (ii) water distribution system improvement by Eastern Java Provincial Government using Japanese ODA fund, and (iii) construction and subsequent lease of an intake facility by GoI. The (iii) component is changeable to “construction of an intake

facility by Eastern Java Provincial Government using Japanese ODA fund on-lent by GoI". Seven key participants in this scheme are (i) JICA, (ii) GoI - MoF, (iii) Eastern Java Provincial Government (iv) GoI - MPW, (v) SPC - Private investors, (vi) PDAB, and (vii) 5 PDAMs (Pasuruan Regency, Pasuruan City, Sidoarjo Regency, Surabaya City, and Gresik Regency).

The Umbulan project has been proposed since about 20 years ago, however the project stopped till feasibility study stage due to the unachieving a consensus between 5 PDAMs. For example, water tariff, fee for water rights, how to pay construction cost etc. Therefore, PDAB was established with the purpose of bulk water supply to 5 PDAMs and to archive their consensus in the provincial organization.



Source: JICA Study Team

Figure 4.6.1-1: Umbulan PPP scheme chart

Described in Figure 4.6.1-1 is one instance of SPC investing 50% of construction cost. In case of 50% investment by SPC, SPC IRR become over 18% on this Project. In 2009 Indonesia, the satisfactory yield for private investors is generally accepted at the SPC IRR of 18% in nominal terms.

JICA is the provider of ODA fund. Under usual ODA lending, JICA concludes a loan agreement with MoF as representative of GoI.

MoF plays two roles. First it acts as GoI's window to receive the Japanese ODA loan proceeds. Then the loan proceeds may be on-lent to Eastern Java Provincial Government to implement the construction work of water distribution system improvement in the 5 PDAM areas. Second, it appropriates budgets for infrastructure development to MPW, part of which may be allocated to construction of Umbulan intake facility (including chlorination facility) and transmission facility to PDAM Pasuruan Regency and PDAM Pasuruan City.

MPW is the ministry to which local infrastructure development funds will be appropriated by MOF. MPW then implements the construction of Umbulan intake facility (including chlorination facility) and transmission facility to PDAM Pasuruan Regency and PDAM Pasuruan City. When the construction is complete, the facilities will either stay at GoI as its assets or be transferred to PDAB. If GoI keeps the assets, another national company may own the assets and lease them to SPC which will be the facility operator. Alternatively MPW will simply channel the fund from MOF to Eastern Java Provincial Government for them to implement the facility construction.

Eastern Java Provincial Government, if assigned the facility construction, they will implement it through its Department of Public Works, using the fund appropriated by MPW. When the construction is complete, the facilities will either stay at Eastern Java Provincial Government or be transferred to PDAB. The owner of intake facilities will lease them to SPC.

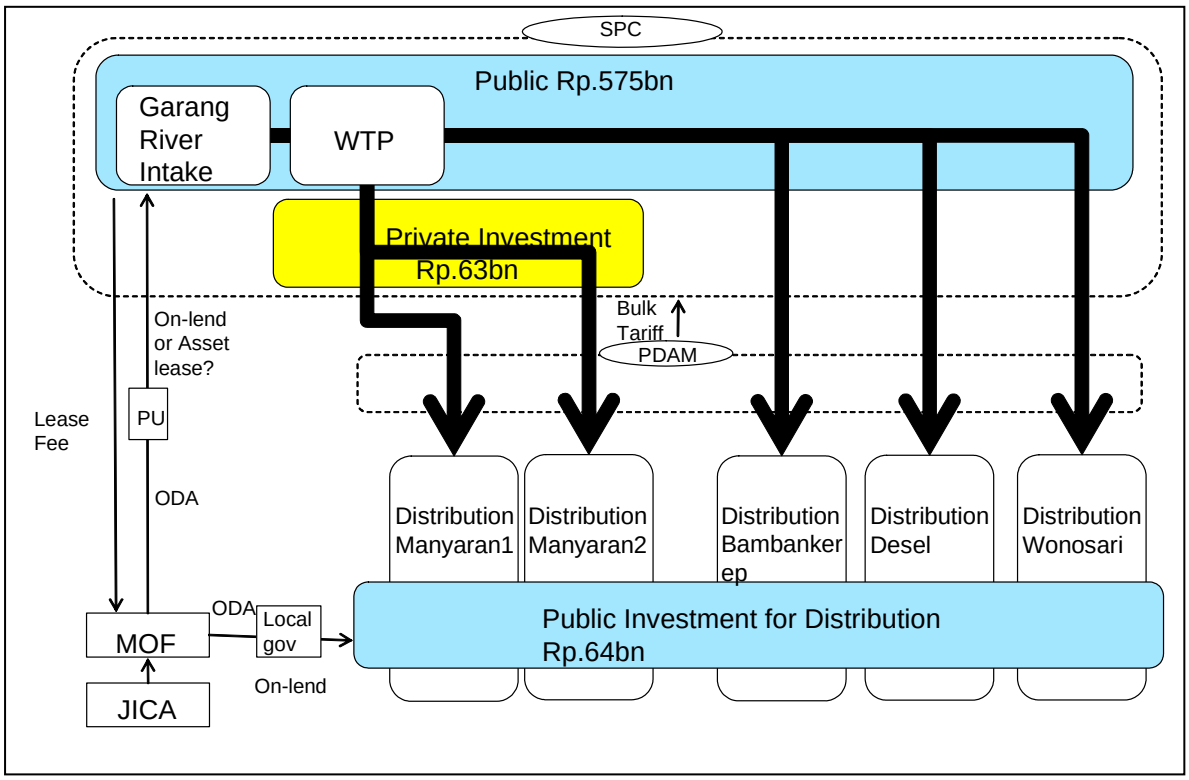
SPC is established by private investors to implement the BOT contract of bulk water supply operation. The private investors, or the SPC owners will finance necessary fund to construct the bulk water transmission facility to 3 PDAMs (Sidoarjo Regency, Surabaya City, and Gresik Regency). After completion, SPC will run the entire bulk water supply operation (intake and transmission facilities to 5 PDAMs). This financing will be made by their own equity participation and/or borrowing from outside commercial banks.

PDAB is the direct taker of bulk water from SPC and the seller to 5 PDAMs (Pasuruan Regency, Pasuruan City, Sidoarjo Regency, Surabaya City, and Gresik Regency). PDAB will have to purchase a certain level of water provided by SPC under a “take-or-pay” agreement even when the demand does not exist. Alternatively, PDAB might pay a capacity charge and a consumption charge to SPC (under a “take-and-pay” agreement), thus sharing the demand risk between the public and private sides.

Each of 5 PDAMs (Pasuruan Regency, Pasuruan City, Sidoarjo Regency, Surabaya City, and Gresik Regency) is the taker of bulk water from PDAB. Between PDAB and each of the PDAMs, similar to the relation between SPC and PDAB, there will be a “take-or-pay” or “take-and-pay” agreement. Those PDAMs will be in turn, distribute the purchased water to end users through their distribution systems. Their distribution systems however need improvement to efficiently distribute the water.

Eastern Java Provincial Government will be the implementation agency of improvement of the 5 PDAMs’ distribution systems. This distribution improvement will be financed by on-lent loan from MoF, using Japanese ODA loan as original funding source. After the improvement work is complete, the improved distribution system assets will be transferred to 5 PDAMs in exchange for Eastern Java Provincial Government’s equity participation to 5 PDAMs.

2) Semarang Project



Source: JICA Study Team

Figure 4.6.1-2: Semarang PPP scheme chart

The proposed Semarang PPP scheme comprises three components, (i) BOT bulk water supply operation by private investors, (ii) water distribution system improvement by Semarang Municipal Government (on which PDAM Semarang is dependent), using Japanese ODA fund, and (iii) construction and subsequent lease of an intake facility by GoI. The (iii) component is changeable to "construction of an intake facility by Semarang Municipal Government using Japanese ODA fund on-lent by GoI". The (iii) component is changeable to "construction of an intake facility by Semarang Municipal Government using Japanese ODA fund on-lent by GoI". Six key participants in this scheme are (i) JICA, (ii) GoI - MoF, (iii) Semarang Municipal Government (iv) GoI - MPW, (v) SPC - Private investors, and (vi) PDAM Semarang.

Described in Figure 4.6.1-2 is one instance of SPC investing 10% of construction cost. In case of 10% investment by SPC, SPC IRR become over 18% on this Project. In 2009 Indonesia, the satisfactory yield for private investors is generally accepted at the SPC IRR of 18% in nominal terms.

JICA is the provider of ODA fund. Under usual ODA lending, JICA concludes a loan agreement with MoF as representative of GoI.

MoF plays two roles. First it acts as GoI's window to receive the Japanese ODA loan proceeds. Then the loan proceeds are on-lent to Semarang Municipal Government to implement the construction work of water distribution system improvement in Semarang. Second, it appropriates budgets for infrastructure development to MPW, part of which is allocated to construction of intake facility

of Semarang project.

MPW is the ministry to which local infrastructure development funds will be appropriated first by MOF. MPW will channel the fund to construct the Semarang intake facility to Semarang Municipal Government.

Semarang Municipal Government, through its Department of Public Works, will use the appropriated fund to implement the construction of Semarang intake facility, water treatment plant (WTP) and transmission facility to the distribution system of Bambankerep, Desel and Wonosari. When the construction is complete, the facilities will either stay at Semarang Municipal Government or be transferred to PDAM Semarang. The owner of constructed facilities will lease them to SPC which will be the facility operator.

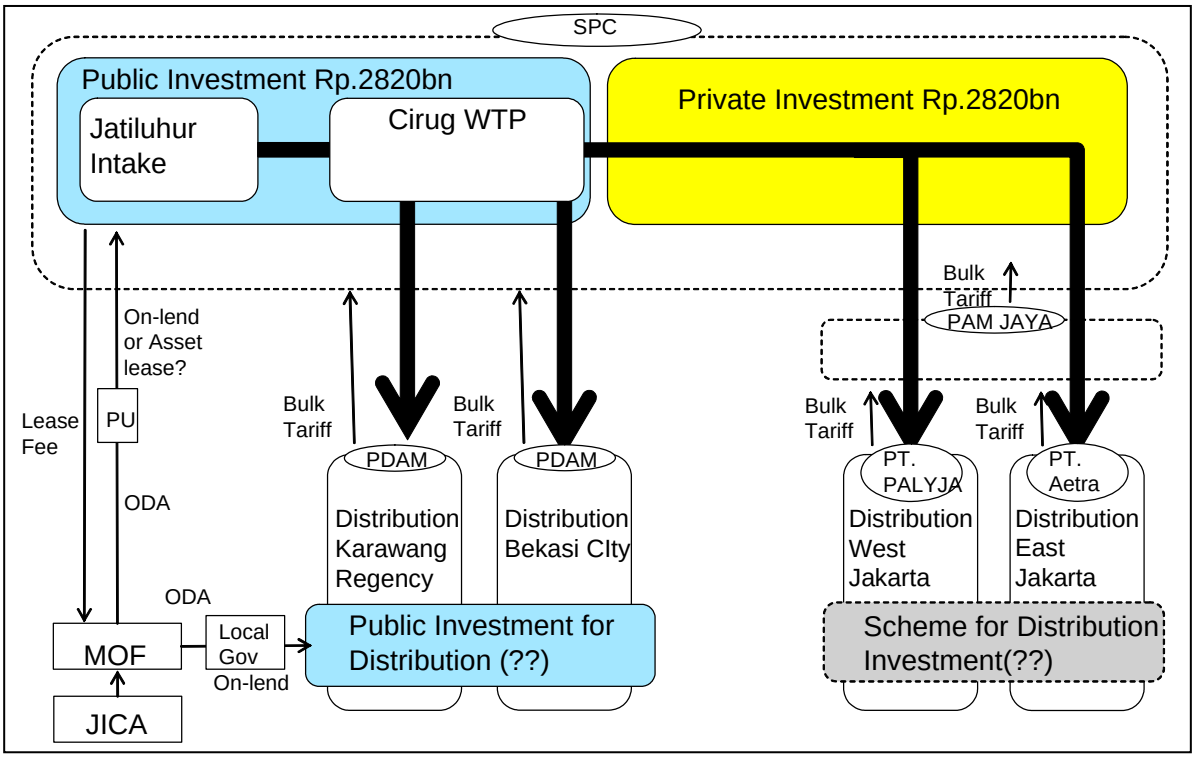
SPC is established by private investors to implement the BOT contract of bulk water supply operation. The private investors, or the SPC owners will finance necessary fund to construct the bulk water transmission facility to the distribution system of Manyaran 1 and Manyaran 2. After completion, SPC will run the entire bulk water supply operation (intake, WTP and all transmission facilities). This financing will be made by their own equity participation and/or borrowing from outside commercial banks.

PDAM Semarang is the direct taker of bulk water from SPC. PDAM Semarang will have to purchase a certain level of water provided by SPC under a "take-or-pay" agreement even when the demand does not exist. Alternatively, PDAM might pay a capacity charge and a consumption charge to SPC (under a "take-and-pay" agreement), thus sharing the demand risk between the public and private sides. PDAM Semarang will distribute the purchased water to end users through its distribution system. The distribution system however needs improvement to efficiently distribute the water.

Semarang Municipal Government will be the implementation agency of improvement of the distribution system of PDAM Semarang. This distribution improvement will be financed by on-lent loan from MoF, using Japanese ODA loan as original funding source. After the improvement work is complete, the improved distribution system assets will be transferred to PDAM Semarang in exchange for Semarang Government's equity participation to PDAM Semarang.

3) JABEKA Project

The proposed JABEKA PPP scheme comprises two components, (i) BOT bulk water supply operation by private investors, and (ii) construction and subsequent lease of intake and water treatment facilities by GoI. Four key participants in this scheme are (i) JICA, (ii) GoI – MoF, (iii) GoI - MPW, and (iv) SPC - Private investors.



Source: JICA Study Team

Figure 4.6.1-3 : JABEKA PPP scheme chart

Described in Figure 4.6.1-3 is one instance of SPC investing 50% of construction cost. In case of 50% investment by SPC, SPC IRR become over 18% on this Project. In 2009 Indonesia, the satisfactory yield for private investors is generally accepted at the SPC IRR of 18% in nominal terms.

JICA is the provider of ODA fund. Under usual ODA lending, JICA concludes a loan agreement with MoF as representative of GoI.

MoF acts as GoI's window to receive the Japanese ODA loan proceeds. Then the loan proceeds are transferred to MPW.

MPW is the ministry to which local infrastructure development funds will be appropriated by MOF. MPW will use the fund to implement the construction work of (i) intake facility (ii) water treatment plant (WTP), and (iii) transmission facility to PDAM Karawang and PDAM Bekasi. When the construction is complete, the facilities will be leased to SPC, which will be the facility operator.

SPC is established by private investors to implement the BOT contract of bulk water supply operation. The private investors, or the SPC owners will finance necessary fund to construct transmission facility to PT Palyja and PT Aetra. After completion of the construction, SPC will run the entire operation of bulk water supply. This financing will be made by their own equity participation and/or borrowing from outside commercial banks.

The bulk water will be sold to PAM JAYA, PDAM Karawang, and PDAM Bekasi. Improvement of their distribution system is not included in this project.

4.6.2 Examination of SPC IRR

It is vital for a PPP based project to be attractive to private investors. This means that a PPP project has a satisfactory yield for private investors. In 2009 Indonesia, the satisfactory yield for private investors is generally accepted at the SPC IRR of 18% in nominal terms. The SPC IRR is the return on private investment portion in a project. We computed the SPC IRR of the base case for each project, using assumptions shown in Table 4.6.2-1.

At the base case of JABEKA project and Umbulan project, the mix of ODA and equity participation is set at 50/50. In case of Semarang project, it is assumed that the private investor will invest in 10% of the bulk water supply operation. The water distribution systems are assumed to be financed by public funds. The lease fee paid to the public (GOI, local governments, or PDAMs) by private (SPC) is set at 4% for Umbulan Project and 3% for Semarang and JABEKA project of the public investment value. This is based on the assumption that the asset built by public fund will be leasable to the SPC for 25 years. The bulk water tariff is set assuming that the bulk water sales are equivalent to the retail revenue minus the distribution O&M cost. The calculation process of SPC IRR also enables calculation of GoI IRR, which means the yield on public fund investment. The results of the IRRs, contrasted with values of FIRR and EIRR are shown in Table 4.6.2-1.

Table 4.6.2-1: Assumptions Used in SPC IRR Computation for Base Case

	Umbulan	Semarang	Jakarta, Bekasi, Karawang
Project capital cost (Rp billion)	2,357	703	5,635
Bulk portion in capital cost	64%	91%	100%
Distribution portion in capital cost	36%	9%	0%
Investment in bulk water supply			
Public (ODA, GoI)	50%	90%	50%
Private (SPC)	50%	10%	50%
Investment in water distribution			
Public (ODA, GoI)	100%	100%	N/A
Private (SPC)	0%	0%	N/A
Lease fee for bulk water facility	4.00%	3.00%	3.00%
Lease fee for distribution facility	0.00%	0.00%	N/A
Total public investment weight	68%	91%	50%
Total private investment weight	32%	9%	50%
Bulk tariff (Rp/m3)	1,405 to 1,825	1,556 to 1,916	2,500

Source: JICA Study Team

Table 4.6.2-2: Project IRR Comparison

	Umbulan	Semarang	Jakarta, Bekasi, Karawang
FIRR (real)	3.8%	0.5%	6.4%
FIRR (nominal)	10.1%	6.5%	12.8%
EIRR (real)	27.6%	29.8%	9.6%
SPC-Bulk Supplier & GoI-Distributor Scheme			
SPC IRR (real)	12.5%	10.6%	11.6%
SPC IRR (nominal)	**19.3%**	**17.2%**	**18.3%**
GoI IRR (real)	0.1%	-1.2%	4.5%
GoI IRR (nominal)	**6.1%**	**4.7%**	**10.8%**

Source: JICA Study Team

The SPC IRR and the GoI cash flows are shown in Table 4.6.2-3 (Umbulan), Table 4.6.2-4 (Semarang), and Table 4.6.2-5 (JABEKA)

Table 4.6.2-3: SPC IRR and GoI IRR Cashflows of Umbulan Project

(Unit: Rp billion in constant 2009 prices)

Year	Public invest in bulk	Private invest in bulk	Public invest in distribution	Private invest in distribution	Retail sales	Bulk sales	Lease fee (Bulk water facility)	Lease fee (Distribution facility)	Bulk O&M	Distribution O&M	Depreciation-private bulk facility	Depreciation-private distribution facility	SPC-bulk & GoI-distribute			SPC-distribute & GoI-bulk		
													Income tax (SPC)	Net benefits (SPC)	Net benefits (GoI/PDAM)	Income tax (SPC)	Net benefits (SPC)	Net benefits (GoI/PDAM)
1	75	75	86	-										(75)	(161)		(75)	(161)
2	225	225	258	-										(225)	(483)		(225)	(483)
3	299	299	344	-										(299)	(643)		(299)	(643)
4	150	150	172	-										(150)	(322)		(150)	(322)
5					197	177	30	0	34	20	19	-	24	69	54	44	(44)	187
6					208	189	30	0	34	20	19	-	26	98	56	47	(47)	202
7					219	200	30	0	34	20	19	-	29	107	59	50	(50)	216
8					235	215	30	0	34	20	19	-	33	118	63	54	(54)	235
9					250	230	30	0	34	20	19	-	37	129	67	58	(58)	254
10					250	230	30	0	34	20	19	-	37	129	67	58	(58)	254
11					250	230	30	0	34	20	19	-	37	129	67	58	(58)	254
12					250	230	30	0	34	20	19	-	37	129	67	58	(58)	254
13					250	230	30	0	34	20	19	-	37	129	67	58	(58)	254
14					250	230	30	0	34	20	19	-	37	129	67	58	(58)	254
15					250	230	30	0	34	20	19	-	37	129	67	58	(58)	254
16					250	230	30	0	34	20	19	-	37	129	67	58	(58)	254
17					250	230	30	0	34	20	19	-	37	129	67	58	(58)	254
18					250	230	30	0	34	20	19	-	37	129	67	58	(58)	254
19					250	230	30	0	34	20	19	-	37	129	67	58	(58)	254
20					250	230	30	0	34	20	19	-	37	129	67	58	(58)	254
21					250	230	30	0	34	20	19	-	37	129	67	58	(58)	254
22					250	230	30	0	34	20	19	-	37	129	67	58	(58)	254
23					250	230	30	0	34	20	19	-	37	129	67	58	(58)	254
24					250	230	30	0	34	20	19	-	37	129	67	58	(58)	254
25					250	230	30	0	34	20	19	-	37	129	67	58	(58)	254
26					250	230	30	0	34	20	19	-	37	129	67	58	(58)	254
27					250	230	30	0	34	20	19	-	37	129	67	58	(58)	254
28					250	230	30	0	34	20	19	-	37	129	67	58	(58)	254
29					250	230	30	0	34	20	19	-	37	129	67	58	(58)	254
Total	749	749	860	- 2,357									SPC IRR (real)= 12.5%			SPC IRR (real)= N/A		
													SPC IRR (nominal)= 19.3%			SPC IRR (nominal)= N/A		
													GoI IRR (real)= 0.1%			GoI IRR (real)= 11.9%		
													GoI IRR (nominal)= 6.1%			GoI IRR (nominal)= 18.6%		

Source: JICA Study Team

Table 4.6.2-4 SPC IRR and GoI IRR Cashflows of Semarang Project

(Unit: Rp billion in constant 2009 prices)

Year	Public invest in bulk	Private invest in bulk	Public invest in distribution	Private invest in distribution	Retail sales	Bulk sales	Lease fee (Bulk water facility)	Lease fee (Distribution facility)	Bulk O&M	Distribution O&M	Depreciation-private bulk facility	Depreciation-private distribution facility	SPC-bulk & GoI-distribute			SPC-distribute & GoI-bulk		
													Income tax (SPC)	Net benefits (SPC)	Net benefits (GoI/PDAM)	Income tax (SPC)	Net benefits (SPC)	Net benefits (GoI/PDAM)
1	58	6	6	-										(6)	(64)		(6)	(64)
2	173	19	19	-										(19)	(192)		(19)	(192)
3	230	26	25	-										(26)	(256)		(26)	(256)
4	115	13	13	-										(13)	(128)		(13)	(128)
5					27	26	17	0	11	1	2	-	-	(9)	17	7	(7)	22
6					31	30	17	0	12	1	2	-	-	1	17	8	(8)	26
7					35	34	17	0	12	1	2	-	1	4	18	8	(8)	30
8					39	38	17	0	13	1	2	-	2	6	19	10	(10)	35
9					41	40	17	0	14	1	2	-	2	7	19	10	(10)	37
10					43	42	17	0	14	1	2	-	2	8	20	10	(10)	38
11					45	44	17	0	15	1	2	-	3	9	20	11	(11)	40
12					47	46	17	0	15	2	2	-	3	10	20	11	(11)	42
13					50	48	17	0	16	2	2	-	3	11	20	12	(12)	44
14					52	50	17	0	17	2	2	-	4	12	21	12	(12)	46
15					54	52	17	0	18	2	2	-	4	13	21	13	(13)	47
16					56	54	17	0	18	2	2	-	4	14	21	13	(13)	49
17					58	56	17	0	19	2	2	-	5	15	22	14	(14)	51
18					60	58	17	0	19	2	2	-	5	16	22	14	(14)	53
19					62	60	17	0	20	2	2	-	5	17	22	15	(15)	54
20					64	62	17	0	21	2	2	-	5	18	23	15	(15)	56
21					66	63	17	0	21	2	2	-	6	19	23	16	(16)	58
22					66	63	17	0	21	2	2	-	6	19	23	16	(16)	58
23					66	63	17	0	21	2	2	-	6	19	23	16	(16)	58
24					66	63	17	0	21	2	2	-	6	19	23	16	(16)	58
25					66	63	17	0	21	2	2	-	6	19	23	16	(16)	58
26					66	63	17	0	21	2	2	-	6	19	23	16	(16)	58
27					66	63	17	0	21	2	2	-	6	19	23	16	(16)	58
28					66	63	17	0	21	2	2	-	6	19	23	16	(16)	58
29					66	63	17	0	21	2	2	-	6	19	23	16	(16)	58
Total	576	64	64	- 703									SPC IRR (real)= 10.6%			SPC IRR (real)= N/A		
													SPC IRR (nominal)= 17.2%			SPC IRR (nominal)= N/A		
													GoI IRR (real)= -1.2%			GoI IRR (real)= 4.3%		
													GoI IRR (nominal)= 4.7%			GoI IRR (nominal)= 10.5%		

Source: JICA Study Team

Table 4.6.2-5: SPC IRR and GoI IRR Cashflows of JABEKA Project

(Unit: Rp billion in constant 2009 prices)

Year	Public fund (GoI)	Private (SPC)	Bulk sales	Lease cost	Bulk O&M	Depreciation (SPC)	Income tax (SPC)	Net benefits (SPC)	Net benefits (GoI)
1	282	282						(282)	(282)
2	845	845						(845)	(845)
3	1,127	1,127						(1,127)	(1,127)
4	564	564						(564)	(564)
5			513	85	206	70	38	185	123
6			807	85	324	70	82	316	166
7			1,100	85	442	70	126	448	210
8			1,100	85	442	70	126	448	210
9			1,100	85	442	70	126	448	210
10			1,100	85	442	70	126	448	210
11			1,100	85	442	70	126	448	210
12			1,100	85	442	70	126	448	210
13			1,100	85	442	70	126	448	210
14			1,100	85	442	70	126	448	210
15			1,100	85	442	70	126	448	210
16			1,100	85	442	70	126	448	210
17			1,100	85	442	70	126	448	210
18			1,100	85	442	70	126	448	210
19			1,100	85	442	70	126	448	210
20			1,100	85	442	70	126	448	210
21			1,100	85	442	70	126	448	210
22			1,100	85	442	70	126	448	210
23			1,100	85	442	70	126	448	210
24			1,100	85	442	70	126	448	210
25			1,100	85	442	70	126	448	210
26			1,100	85	442	70	126	448	210
27			1,100	85	442	70	126	448	210
28			1,100	85	442	70	126	448	210
29			1,100	85	442	70	126	448	210
				SPC IRR (real terms)= 11.6%				GoI IRR (real)= 4.5%	
				SPC IRR (nominal terms*4)= 18.3%				GoI IRR (nominal)= 10.8%	

Source: JICA Study Team

We performed a series of simulations to examine how the GOI IRR and SPC IRR react, by changing variables of (i) public/private funding mix for bulk water supply facility, and (ii) level of lease fee. The public investment in distribution was set at 100% in case of Umbulan and Semarang projects. The results are summarized in Table 4.6.2-6 (Umbulan), Table 4.6.2-7 (Semarang), and Table 4.6.2-8 (JABEKA).

Naturally the higher the lease fee, the higher the GOI IRR, and the lower the SPC IRR. It is noted that the higher the public investment portion in bulk water operation, the higher the SPC IRR. This is because the private does not have to invest too much in initial capital cost while the O&M cost does not increase too much even including lease payment.

Table 4.6.2-6: GOI IRR and SPC IRR Simulation for Umbulan Project

	Public Private Ratio in Bulk Water Operation					
	25 : 75		50 : 50		75 : 25	
Lease fee	GOI FIRR	SPC FIRR	GOI FIRR	SPC FIRR	GOI FIRR	SPC FIRR
4%	6.4%	15.9%	6.1%	19.3%	6.0%	27.2%
3%	6.0%	16.1%	5.5%	19.9%	5.2%	28.7%
2%	5.5%	16.3%	4.8%	20.5%	4.3%	30.1%
1%	5.1%	16.6%	4.0%	21.1%	3.3%	31.5%
0%	4.6%	16.8%	3.2%	21.7%	2.2%	32.8%
Public/Private ratio in total investment	52 : 48		68 : 32		84 : 16	

Source: JICA Study Team

Table 4.6.2-7: GOI IRR and SPC IRR Simulation for Semarang Project

	Public Private Ratio in Bulk Water Operation							
	25 : 75		50 : 50		75 : 25		90 : 10	
Lease fee	GOI FIRR	SPC FIRR	GOI FIRR	SPC FIRR	GOI FIRR	SPC FIRR	GOI FIRR	SPC FIRR
4%	7.1%	7.5%	6.4%	8.2%	6.1%	9.9%	6.0%	12.7%
3%	6.2%	7.8%	5.3%	9.2%	4.9%	12.1%	4.7%	17.2%
2%	5.3%	8.2%	4.1%	10.1%	3.5%	14.1%	3.2%	21.3%
1%	4.3%	8.5%	2.7%	10.9%	1.8%	16.0%	1.5%	25.3%
0%	3.2%	8.8%	1.0%	11.7%	-0.2%	17.8%	-0.7%	29.2%
Public/Private ratio in total investment	32 : 68		55 : 45		77 : 23		91 : 9	

Source: JICA Study Team

Table 4.6.2-8: GOI IRR and SPC IRR Simulation for JABEKA Project

	Public Private Ratio in Total Investment					
	25 : 75		50 : 50		75 : 25	
Lease fee	GOI FIRR	SPC FIRR	GOI FIRR	SPC FIRR	GOI FIRR	SPC FIRR
4%	16.0%	14.6%	11.7%	17.7%	9.9%	24.8%
3%	15.3%	14.9%	10.8%	18.3%	8.9%	26.3%
2%	14.6%	15.1%	9.8%	18.9%	7.8%	27.7%
1%	13.9%	15.3%	8.8%	19.5%	6.5%	29.0%
0%	13.1%	15.6%	7.7%	20.1%	5.2%	30.3%

Source: JICA Study Team

Based on this project's screening result, it is expected that 1-2 projects will be selected for further feasibility study. Within this FS, we suggest that above simulation method will be used to determine the details of PPP scheme, including how public and private portion should be split. It is also suggested that detailed simulation of GoI IRR and SPC IRR be performed including analysis of split up of GoI IRR into the central government, local governments, and PDAMs basis. Details of suggested next steps are described in Chapter 5.

Data of the 3 selected projects are further organized in a data sheet form.

Umbulan PPP Project Sheet

1. Project Name
   - Country: Indonesia
   - Project Name: Umbulan Water Supply
   - Project Cost: IDR 2,400 billions

2. Project Objectives
   - To provide clean water supply to Surabaya city, Gresik Regency, Sidoarjo regency, and both Pasuruan city and regency, since shortage of raw water for Surabaya, Sidoarjo and Gresik while those areas are prospective developed becoming metropolitan and industries area in future.

3. Project Scope
   - Project Area: Surabaya, Gresik regency, Sidoarjo regency, Pasuruan city and regency
   - Project Components: Intake and disinfectant Plant, bulk transmission pipe and distribution pipeline
   - Project Cost Breakdown (IDR billion): Intake and disinfectant Plant (32), bulk transmission pipe (1,568) and distribution pipeline (860)
   - Institutional Framework:
     - Contracting agency : Governor of East Java Province
     - Relevant Stakeholders : Central Cipta Karya Ministry of Home Affair (MOHA), Province East Java gov't, Provincial Cipta Karya, Provincial PU Water Resources, Surabaya gov't, Gresik regency gov't, Sidoarjo regency gov't, Pasuruan municipal gov't, Pasuruan regency gov't, PDAB, PDAM Surabaya, PDAM Gresik PDAM Sidoarjo regency, PDAM Pasuruan municpal, PDAM Pasuruan regency

4. PPP Modality/Scheme :
   - Vertical split
   - Private portion : Design-Build-Operate-Transfer
   - Public portion : Lease-Operate-Transfer

5. Necessity and Viability of the Project
- Current Issues in Umbulan Water Supply project
  - Organizational and law issues such as central-provincial-local government coordination to improve water supply infrastructure; Umbulan spring water right that legally is managed by province however Pasuruan regency has claimed to be managed under the regency; and regulatory barriers against to private sector participation (e.g. tariff setting degrees of freedom)
  - Operational issues
    - Need increasing coverage services area that is average in those regions 45% to be 65% in 2016;
    - high NRW (Non-Revenue-Water) that is varied on 35% to 46% in 2009 and it is planned to be reduced becoming 30% in 2016;
    - Need concrete plan for extension distribution pipeline to absorption Umbulan water from all operator PDAMs involved

Cont'n of Umbulan PPP Project Sheet

- •Performance of PDAMs involved in the project is based on overdue date (Rp.bn) in 2007, are Pasuruan reg. does not have information, Pasuruan ct (22), Sidoarjo reg. does not have it, Surabaya (0.8) and Gresik reg. (14)
- Consistency with Upper Sectoral Plan:
  - •To support government program on MDGs in 2016, all 5 regions have gap demand 4,800 l/sec.
  - •Umbulan spring water is potency water resources for all 5 regions especially for Surabaya, Sidoarjo, and Gresik as industrial and commercial area that need many clean water while they have problem in shortage of water resources.

6. Risk

Type of Risk	Risk Allocation	
	Government	Private
1. Construction risks:		
a. Cost overrun, delay construction, completion risk		✓
b. Land acquisition	✓	
2. Operation risks:		
a. Raw water shortage quantity & quality risk	✓	
b. Treated water quality risk, system maintenance risk		✓
c. Tariff setting risk	✓	
d. Demand guarantee	✓	
3.Government risks:		
a. Legal risk, change of Law, Economic risk	✓	
b. Currency risk	✓	✓
4. Force majeure:		
a. Natural disaster risk,	✓	✓
b. Civil disturbance risk, political risk	✓	

7.Expected Impact
•Project FIRR : 10.1%

8.Environmental and Social Considerations
The project takes water from Umbulan spring water that naturally has catchment area in out of Pasuruan regency like as Lumajang regency, Probolinggo regency and Malang regency, the continuity of spring water capacity on Umbulan spring water is depend on activity in the catchment area which should keep forestry vegetations. To avoid the deforest activities, the regions in catchment area should be involved in environmental management.
The transmission pipeline is 92km with various pipe dia. 1000mm to 1800mm, and water capacity intake 4000 l/sec. the project size has beyond the standard required and the project should have EIA document due to the length of the transmission pipe is more than 10 km, intake capacity is more than 250 l/sec. and distribution area plan is more than 500 ha.

The predicted significant social environmental impact will occur on land acquisition for small part of transmission pipeline (about 16 ha) and public perception on the project during pre construction, construction and post construction phases as well as natural environmental impact in the umbulan spring catchment area. The detail description for environmental and social issues will be obtained on EIA document that currently is not carried out yet.

Source: JICA Study Team

West Semarang PPP Project Sheet

1. Project Name
   - Country: Indonesia
   - Project Name: Water Supply Works for the Western Area of Semarang City
   - Project Cost: IDR 824 millions

2. Project Objectives
   - To provide clean water to western area of Semarang City. This piped water supply development is expected can reduce the over exploitation of groundwater which cause land subsidence in the coastal area.

3. Project Scope
   - Project Area: Western area of Semarang City, is defined as area covered by Cabang Barat where comprises 5 Kecamatan (Semarang Barat, Tugu, Ngaliyan, Mijen, and part of Gunungpati)
   - Project Components: Intake-Water Treatment Plant-Transmission, and distribution facilities
   - Project Cost Breakdown (IDR billion): Intake-Water Treatment Plant-Transmission (455), and Distribution Facilities (369)
   - Institutional Framework:
     - Contracting agency: Mayor of Semarang City
     - Relevant stakeholder : Central Cipta Karya, Semarang regency gov't, Semarang City gov't, PDAM Semarang city, Balai Besar Pamali-Juana (water resources management center)

4.PPP Modality/Scheme :
- Vertical split
- Private portion : Design-Build-Operate-Transfer
- Public portion : Lease-Operate-Transfer

5. Necessity and Viability of the Project
   - Current Issues in Water Supply Sector
     - •Organizational and law issues is regulatory barriers against to private sector participation (e.g. tariff setting degrees of freedom)
     - •Operational issues
       - coverage services area that is average in those regions 10% to be 70% in 2017;
       - Performance of PDAM Semarang city that is involved on the project, has Rp. 284 billion overdue date debt in 2007.
   - Consistency with Upper Sectoral Plan:
     To support government program on MDGs in 2015, through west Semarang water supply, house connection will increase about 29,000 connections.

Cont'n of West Semarang PPP Project Sheet

6. Risk

Type of Risk	Risk Allocation	
	Government	Private
1. Construction risks:		
a. Cost overrun, delay construction, completion risk		✓
b. Land acquisition	✓	
2. Operation risks:		
a. Raw water shortage quantity & quality risk	✓	
b. Treated water quality risk, system maintenance risk		✓
c. Tariff setting risk	✓	
d. Demand guarantee	✓	
3.Government risks:		
a. Legal risk, change of Law, Economic risk	✓	
b. Currency risk	✓	✓
4. Force majeure:		
a. Natural disaster risk,	✓	✓
b. Civil disturbance risk, political risk	✓	

7.Expected Impact
•Project FIRR : 6.5%

8.Environmental and Social Considerations
West Semarang water supply takes raw water from Jatigarang weir that is planning to be constructed and will be finished in 2004 for construction and need more one year for impounding water in weir, the weir is basiccally has function for flood control.
The raw water transmission pipe is 2km with dia. 900mm and treated water transmission pipe is 13km with dia 450mm to 900mm. The intake is located adjoining with final solid waste disposal of Semarang at sub-district Bambangkerep. In the location, many scavenger activities, small part of raw water transmission pipeline will pass this location and it is potency to get reaction from the scavenger, while the mostly pipeline will pass along river that is owned by Balai Besar.
the project size has beyond the standard required and the project should have EIA document due to the length of the transmission pipe is more than 10 km, intake capacity is more than 250 l/sec. and distribution area plan is more than 500 ha.

Regarding to the result of EIA conducted by consultant, mostly activities has not significant impact to environmental component which is shown with impact value from negative-small to negative medium.

Source: JICA Study Team

Jakarta-Bekasi-Karawang (Jabeka) Project Sheet

1. Project Name
   - Country: Indonesia
   - Project Name: Jakarta-Bekasi-Karawang
   - Project Cost: IDR 3,778 billions

2. Project Objectives
   - To provide clean water supply to Jakarta, Bekasi and Karawang, and to minimize groundwater usage in Jakarta

3. Project Scope
   - Project Area: Purwakarta, Jakarta, Bekasi, Karawang
   - Project Components: Water Treatment Plant, bulk transmission pipe, tapping points and design
   - Project Cost Breakdown (IDR billion): Water Treatment Plant (456), bulk transmission pipe (2,129), tapping points (193) and design (999)
   - Institutional Framework:
     - Contracting agency: Ministry of Public Works
     - Relevant stakeholders: DKI Jakarta, Bekasi municipal gov't, Bekasi regency gov't, Karawang regency gov't, PAM jaya, PDAM Bekasi municipal and regency, PDAM Karawang regency, PT. Palyja, PT. Aetra, PTJ II, PT. Jasa Marga

4.PPP Modality/Scheme :
   - Vertical split
   - Private portion : Design-Build-Operate-Transfer
   - Public portion : Lease-Operate-Transfer

5. Necessity and Viability of the Project
   - Current Issues in Water Supply Sector
     - •<u>Organizational and law issues</u>:
       - Since Jabeka project is unsolicited type, applying President Decree No. 67 regarding PPP project should be confirmed to private side.
     - •<u>Operational issues</u>
       - Need increasing coverage services area that is average in those regions 49% to be 64% in 2015;
       - high NRW (Non-Revenue-Water) that is varied on 32% to 36% in 2009 and it is planned to be reduced becoming 22 to 30% in 2015;
       - Need concrete plan for extension distribution pipeline and improving services (24 hours services, quality and quantity of treated water) from all operator including PAM Jaya (PT. Palyja and PT. Aetra) and PDAMs involved
       - Performance of PDAMs involved in the project is based on overdue date (Rp.bn) in 2007, are PAM Jaya does not have it, Bekasi (54.8) and Karawang (32)
   - Consistency with Upper Sectoral Plan:
     To support government program on MDGs in 2015, Jakarta, both Bekasi municipal and regency and Karawang regency have 23,400 l/sec. gap water demand until 2015 to cover 64% average served area in those regions

Cont'n of Jakarta-Bekasi-Karawang (Jabeka) Project Sheet

6. Risk

Type of Risk	Risk Allocation	
	Government	Private
1. Construction risks:		
a. Cost overrun, delay construction, completion risk		✓
b. Land acquisition	✓	
2. Operation risks:		
a. Raw water shortage quantity & quality risk	✓	
b. Treated water quality risk, system maintenance risk		✓
c. Tariff setting risk	✓	
d. Demand guarantee	✓	
3.Government risks:		
a. Legal risk, change of Law, Economic risk	✓	
b. Currency risk	✓	✓
4. Force majeure:		
a. Natural disaster risk,	✓	✓
b. Civil disturbance risk, political risk	✓	

7.Expected Impact
•Project FIRR : 12.8%

8.Environmental and Social Considerations
Jabeka project has about 60km length of transmission pipeline with dia. 2,000mm and WTP with capacity 15,000 l/sec which will be build adjoining with Curug weir in inundated area. Small part of transmission pipeline will pass public area then the pipe pass toll road that has got permission from PT. Jasa Tirta for utilization the toll line. WTP location will use area owned by PJT II that does not need land acquisition, however the location currently used by people in surrounding for paddy field and some people put fish blanket in the inundated water.
Jabeka project is beyond the standard stipulated in Environmental Ministry regulation no 11/2006, the project should has EIA document due to the length of the transmission pipe is more than 10 km, intake capacity is more than 250 l/sec. and distribution area plan is more than 500 ha.

The predicted significant social environmental impact will occur on land acquisition for small part of transmission pipeline and public perception on the project during pre construction, construction and post construction phases. The detail description for environmental and social issues will be obtained on EIA document that currently is not carried out yet.

Source: JICA Study Team

CHAPTER-5 SUMMARY OF ISSUES AND SUGGESTED NEXT STEPS (INCLUDING RECOMMENDATIONS FOR TECHNICAL SUPPORT)

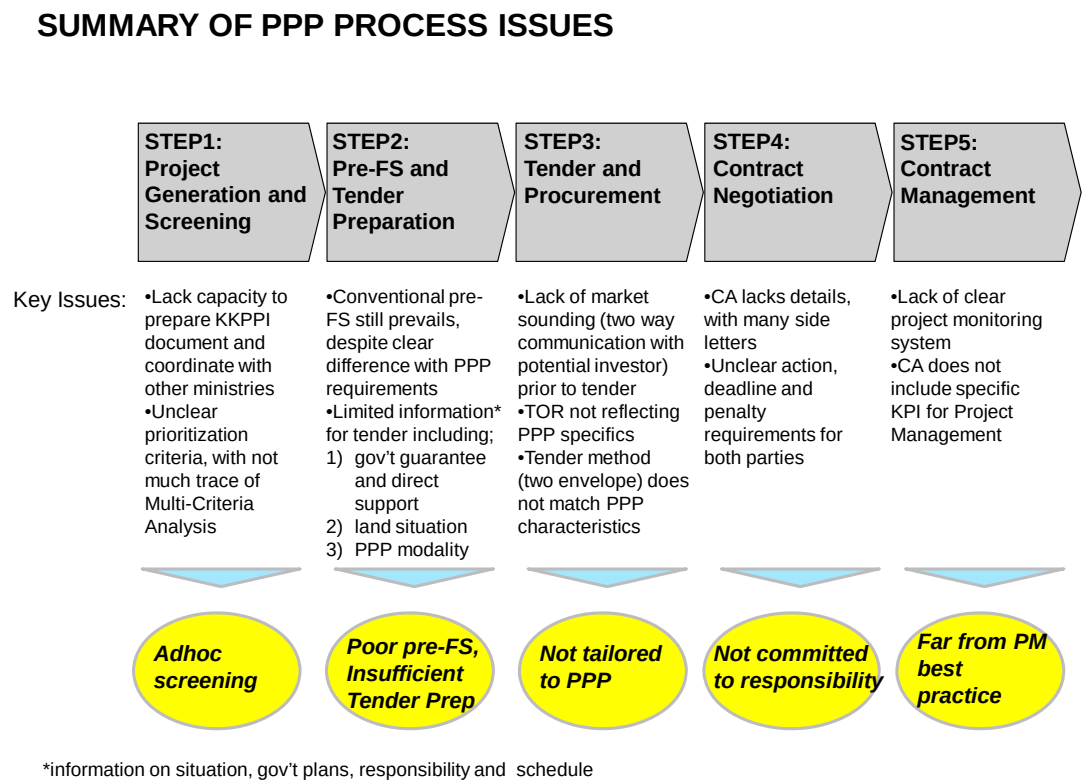
5.1 Synthesis of overall issues and required technical support

As we consider what will be the practical next steps following the results of this study, we would like to first summarize the overall observed issues of PPP and recommend suggested improvements to the overall PPP investment environment.

5.1.1 Summary of PPP process issues

Based on interviews and document reviews, we have described PPP process situation and issues in chapter2. In essence, each step of the PPP process has issues and requires conscious efforts for on-going improvement.

Figure 5.1.1 describes the issues summary along 5 steps of PPP. Issues of each step are; Step1 Project generation and screening: “adhoc careening”, Step2 Pre-FS and Tender Preparation: “poor pre-FS, insufficient tender preparation”, Step3 Tender and procurement: “not tailored to PPP”, Step4 Contract negotiation: “not committed to responsibility, Step5 Contract management: “far from PM best practice”.



Source: Team analysis

Figure 5.1.1 Summary of PPP process issues

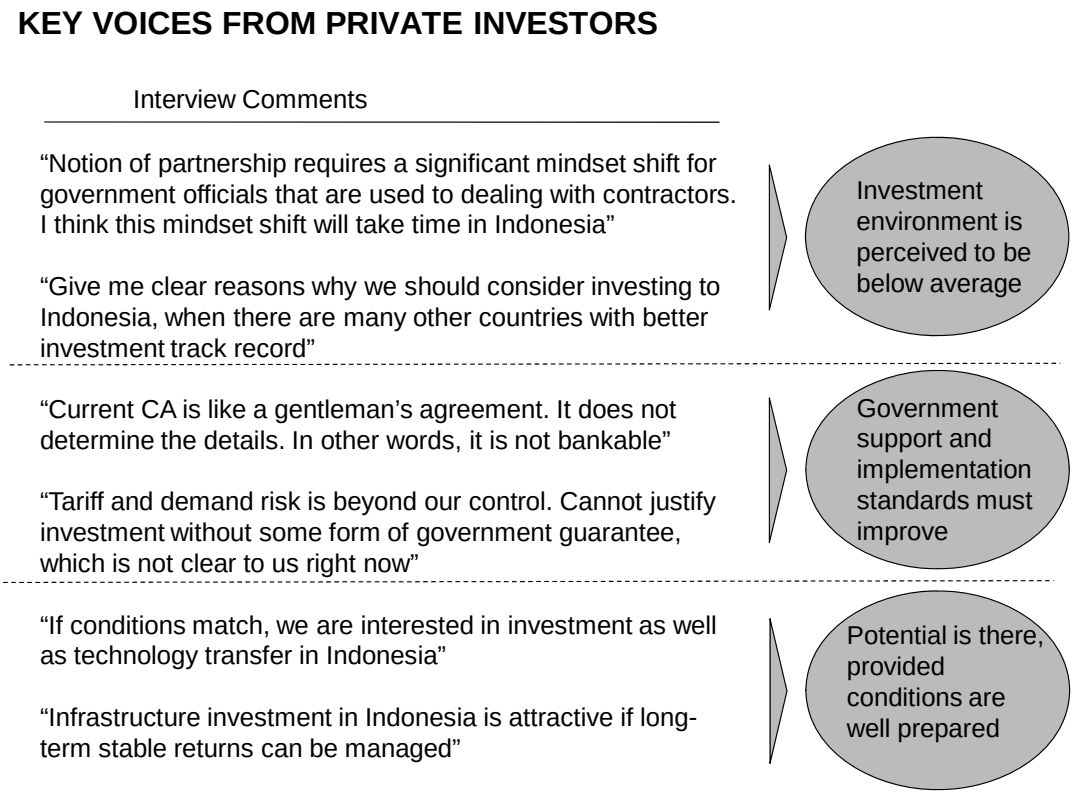
5.1.2 Key inputs from private investors

Solving issues in the eyes of private investor will be crucially important. Details have been described in chapter3 and 4. Here, to sum it up, we would like to introduce selected key voices from interviews. (Figure 5.1.2)

Investors seem to have a perception that PPP investment environment in Indonesia is "below average", compared to other neighboring countries. It is important to note that investors look at investment opportunities around the globe. Indonesia must benchmark best practice and make sustained efforts to catch up.

Investors are especially concerned about the commitment of government support and the reliability of implementation by government. We are asking investors to bring additional funding capacity. Therefore, project returns must be attractive enough using government support.

If conditions are well-prepared, there is solid potential for private investors to participate. Many investors commented on the potential of this country. We believe that it is incumbent on the government to make changes and stimulate investor's appetite.



Source: team interview.

Figure 5.1.2 Key voices from private investors

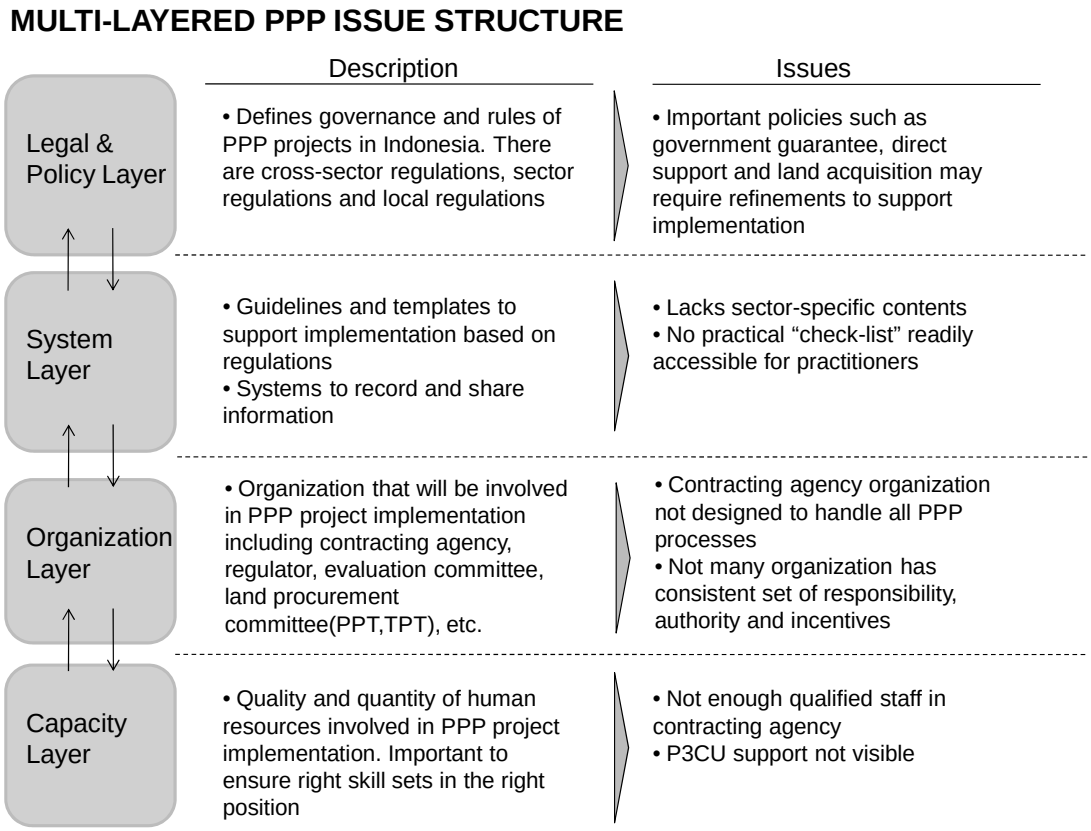
5.1.3 Multi-layered issues structure

Issues regarding PPP are complex in nature. During the course of the study, we repeatedly asked the question, "How can PPP environment be improved to attract private participation and accelerate infrastructure development?"

Some pointed out needs to revise laws and regulations. Some pointed out capacity issues. Some say the organization is not working well. Some pin-pointed the needs to have better guidelines and systems .

Our view is that all these inputs are relevant. It is a multi-layered issue structure. As explained in Figure 5.1.3, four layers of inter-related issues must be solved. The layers are; 1) legal and policy, 2) systems, 3) organization and 4) capacity.

It means just solving for one layer is not enough. A simultaneous and on-going effort to improve all layers must be executed. For example, PPP process defined in the system layer must be reflected in how the contracting agency organization should be designed.



Source: team analysis

Figure 5.1.3 Multi-layered issue structure

5.1.4 Recommendations for overall PPP improvement

We have developed 10 modules of required actions to improve the overall PPP environment. Needless to say, given the numerous initiatives already under way by various institutions, many of these modules are not new and some are almost complete (e.g. revision of Perpres67).

However, we wanted to paint a holistic picture, along the four inter-related layers, to re-assert the needs to make a concerted effort to take actions for improvement.

10 modules are;

1. Accelerate refinements to PPP related regulations: This requires continuous improvements to reflect the practical realities of implementation needs. This study would like to raise three representative examples. 1) Revision of Perpres67: This should clearly state the government's responsibility to provide land. This means initial funding for land should come from government budget. Also, description of government's contingent support and direct support should be strengthened, especially on approval criteria and schedules. 2) Synchronization between sector law and Perpres67: There are inconsistencies in areas such as tender method. Each sector ministries should see Perpres67 as the basic philosophy for PPP and revise sector law wherever appropriate. 3) Refinements to land procurement Perpres36/2005&65/2006: Socialization and negotiation with land owners is a time consuming task. Regulations should not limit such activities to a PPT/PTP committee structure. Rather, more degrees of freedom should be given to delegate to a dedicated land acquisition organization and/or 3rd party outsourcing.

2. Clarify policy for mix of private and public funds:Not many infrastructure development projects in Indonesia can justify returns for 100% private investment. In this study, which focused on toll road and water supply sectors, we have looked into PPP scheme mixing private and public funds. However, it seems government policies for such scheme are not clear enough. For example, one of approval criteria for contingent support is financial viability. How to measure financial viability for projects mixing private and public funds? Will it be based on project FIRR or SPC FIRR or GOI FIRR? Figure5.1.4-1 describes examples of policy clarification requirements in more detail.

3. Position "OGM" as official guideline: PPP Operations Guideline Manual (OGM) was developed by CMEA. This guideline describes the details of terminologies and concepts surrounding PPP. However, actual usage of this guideline seems to be still low, despite high quality contents. Positioning this OGM as an official guideline, linked to revised Perpres67,should bring up utilization levels.

4. Develop sector-specific and PPP-tailored template: Systems to support contracting agency should be further developed. This is especially true for templates along each PPP step. Several examples can be raised; 1) MCA for PPP project screening requires sector-specific criteria. Also, the evaluation weight for

MCA should be tailored to the requirements of each sector. 2) Pre-FS for PPP project requires template to standardize the contents. 3) Tender TOR and tender method requires template to standardize the contents. 4) CA between contracting agency and private investor requires template to ensure sufficient details are agreed

5. Set-up "pre-conditions" for tender: Currently, many PPP projects enter into tender stage despite insufficient tender preparation. Some form of "check list" should be developed to ensure that "pre-conditions" for tender are fulfilled before tender.

6. Change PPT approach for land acquisition: Land acquisition socialization and negotiation is currently under the responsibility of PPT, which is a part-time committee. This PPT approach may not be optimal. For example, much of negotiation activities require dedicated staff that can visit land owners at night. Therefore, a dedicated organization for land acquisition could be considered.

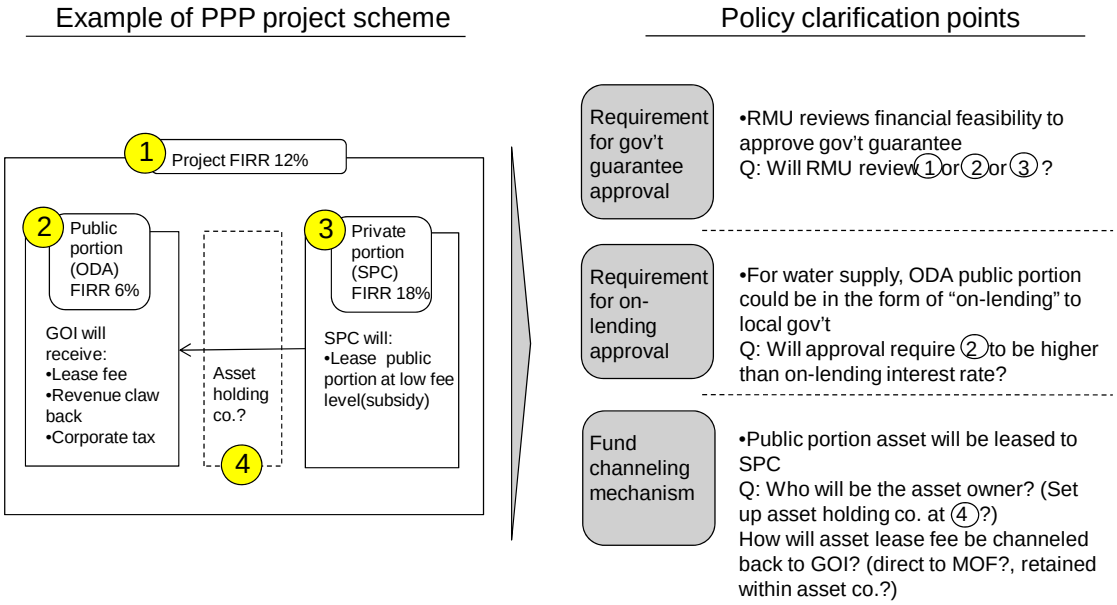
7. Launch advisory committee to support evaluation committee: Evaluation of PPP project proposal requires rich set of knowledge regarding PPP scheme. It maybe practically difficult to find evaluation committee members with sufficient knowledge, given limited overall PPP experience in Indonesia. Therefore, an adivisory committee, with global standard experience and knowledge, could be considered to support activities of evaluation committee.

8. EnhanceP3CU, P3Node, empowered to review and coach on tender documents and CA: Contracting agencies need on-going expert support. P3CU and P3Node was intended to play such role. However, currently their support is not visible. Measures are required to enhance P3CU and P3Node.

9. Take bold steps to significantly strengthen contracting agency capacity: Most of key PPP steps are under the responsibility of contracting agency. Private investors have expressed concerns regarding contracting agency's capacity, especially in the area of financial expertise, legal expertise and business negotiation. Significant measures are required to uplift capacities in these areas. For example, inject critical mass of new human resources with financial and legal background. Also, hire external experts to provide on-going OJT to contracting agency's staff.

10. Hold cross-ministerial/investor/financier/operator workshops: It is necessary to make continuous efforts to bring up overall PPP stakeholder capacity. One of effective way is to share experiences of actual cases, both success cases and failure cases, between ministries, investors, financiers and operators. Needless to say, it is important to hold such workshops periodically rather than adhoc.

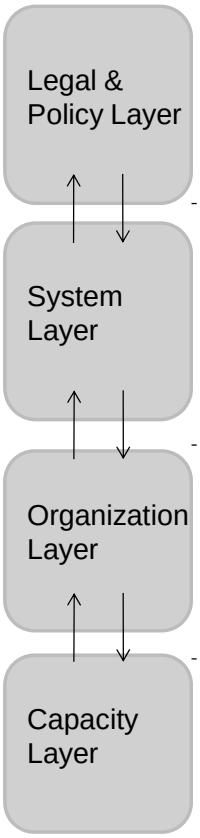
POLICY CLARIFICATION REQUIRED FOR MIX OF PUBLIC AND PRIVATE FUND



Source: team analysis

Figure 5.1.4-1 Recommendation for PPP improvements

RECOMMENDATIONS FOR PPP IMPROVEMENTS IN INDONESIA



1.Accelerate refinements to PPP related regulations
-Perpres67/2005 revision including; 1)gov't responsibility to provide land, 2)clarification of gov't guarantee and direct support, including decision timeline
-Synchronize sector law/regulation with Perpres67
-Refinements to land procurement Perpres36/2005&65/2006 on nego&comp

2.Clarify policy for mix of private and public funds

3.Position "OGM" as official guideline

4.Develop sector-specific and PPP-tailored template
-Sector-specific MCA
-PPP-tailored:1) pre-FS, 2)tender TOR, 3)tender method, 4)CA template

5.Set up "pre-conditions" for tender. For example,
-Gov't pre-acquires a defined minimum percentage of land and prepares inventory info and schedule for remainder
-Principle approval for gov't guarantee and direct support, with timeline for official approval

6.Change PPT approach for land acquisition
-Full-time professionals in frontline, including 3rd party outsourcing
-Incentivized for timeliness and cost
-Direct door-to-door negotiation power

7.Launch advisory committee (with global standard staff) to support evaluation committee

8.Enhance P3CU, P3Node, empowered to review and coach on tender doc, CA

9.Take bold steps to significantly strengthen contracting agency capacity
-Inject legal, financial and business negotiation staff
-Leverage 3rd party experts and continuously operate OJT

10.Hold cross-ministerial/investor/financier/operator workshops to learn from real success and failure cases in Indonesia and overseas

ource: team analysis

Figure 5.1.4-2 Recommendation for PPP improvements

5.2 Toll road issues and recommendations for next steps

5.2.1 Summary of toll road issues

Before describing recommended next steps for toll road, following this study, we would like to recapture the essence of toll road BOT/PPP issues.

Structurally, much of the sections with high traffic expectations already have CA. Therefore, remaining sections need some form of government guarantee or direct support. Otherwise, private investors will not show appetite.

Even if a project reaches CA, most toll road projects are not moving forward on schedule due to land acquisition bottlenecks. This is perhaps the most urgent issue to solve. Solution direction must address both negotiation and funding bottlenecks.

Lastly, current CA content is not action binding and both public and private party has not fulfilled their obligation.

In the next section, we would like to touch on what could be done to de-bottleneck land acquisition.

OBSERVED ISSUES OF TOLL ROAD BOT/PPP

Situation	Reason
In general, limited number of bidders participate	•**High funding requirements, despite low potential FIRR:** Remaining sections do not have enough traffic volume and private has little appetite to fund both land and construction •**Unclear government support:** Government guarantee or cost sharing scheme not clear for bidders
Many projects not moving forward even if it reaches CA signing	•**Lead time of land acquisition negotiation:** TPT and PPT socialization / negotiation takes time, due to price hike •**Lack of land acquisition funds:** Funds from private not readily available. Some private concessionaires may have lost funding capability or motivation.
CA not terminated despite many years of limited activity	•**Non-compliance of both public and private:** Government has not fulfilled deadline to complete land acquisition negotiation on time. Private has not fulfilled funding requirements. Therefore, the case could be taken to court upon abrupt termination. Some private may prefer to "wait and see" and seek timing to sell or buy concession rights

Source: team analysis

Figure 5.2.1 Toll road issue

5.2.2 Land acquisition

We have outlined specific land acquisition issues and directions for solution along acquisition process; freeze transaction, secure funds, socialize/negotiate and court settlement (as last resort). (Figure 5.2.2)

Funding is one that requires government policy decision. Most investors we interviewed expressed concerns about the requirement for private concessionaire to prepare funds. Solution should include clearly the revision of Perpres 67 to state government's full responsibility to fund and provide land. Alternatively, government could commit to provide land but ask private bidders to reimburse to government as part of tender condition. This will ease government funding requirement but also reduce attractiveness to potential bidders.

Socialization and negotiation requires organization and capability attention. In our view, current PPT committee method is ineffective for three reasons. First, it is a part-time organization. Second, there is no incentive for results. Third, technical skills of committee members are questionable. Socialization and negotiation is a difficult task. Effective organization must fulfill the reverse conditions; 1) full-time dedicated organization, 2) qualified professionals, 3) incentivized for results.

LAND ACQUISITION ISSUES AND SOLUTION DIRECTION

	Freeze Transaction	Secure Funds	Socialization and Negotiation	Court Settlement
Description:	•Issue SP2LP to freeze transaction after ROW is fixed	•Private concessionaire expected to prepare fund •Land capping fund*/revolving fund to support transaction	•TPT set up for budget management PPT(committee) conducts nego with land owner • Independent appraisal for market price and comp price	•Once either 75% of land cleared or 75% of land owner agree to price within one construction section, court settlement within that section is possible after 120days of negotiation
Issue:	•Delayed timing of SP2LP issuance, in consideration of duration	•Some private party unwilling/or unable to prepare funds (e.g. cannot secure bank guarantee for BLU)	•Land ownership sometimes not registered •PPT is part-time committee without strong incentive to complete negotiation	•Only 3 cases settled in court because: 1)socialization section is too big to reach 75%, 2)difficult to convince local officials
Solution direction:	•Allow longer SP2LP duration given project lead time	•Government to be responsible to provide land (revision of PR67)	•Revise PR36&65 to change PPT approach •Set up dedicated org with professional staff. Provide incentives for timely completion •Allow outsourcing to private contractors	•Ensure socialization is done in smaller sections and focus efforts to reach 75% or more

*100% price=(NJOP + Market Price)/2

Source: team analysis

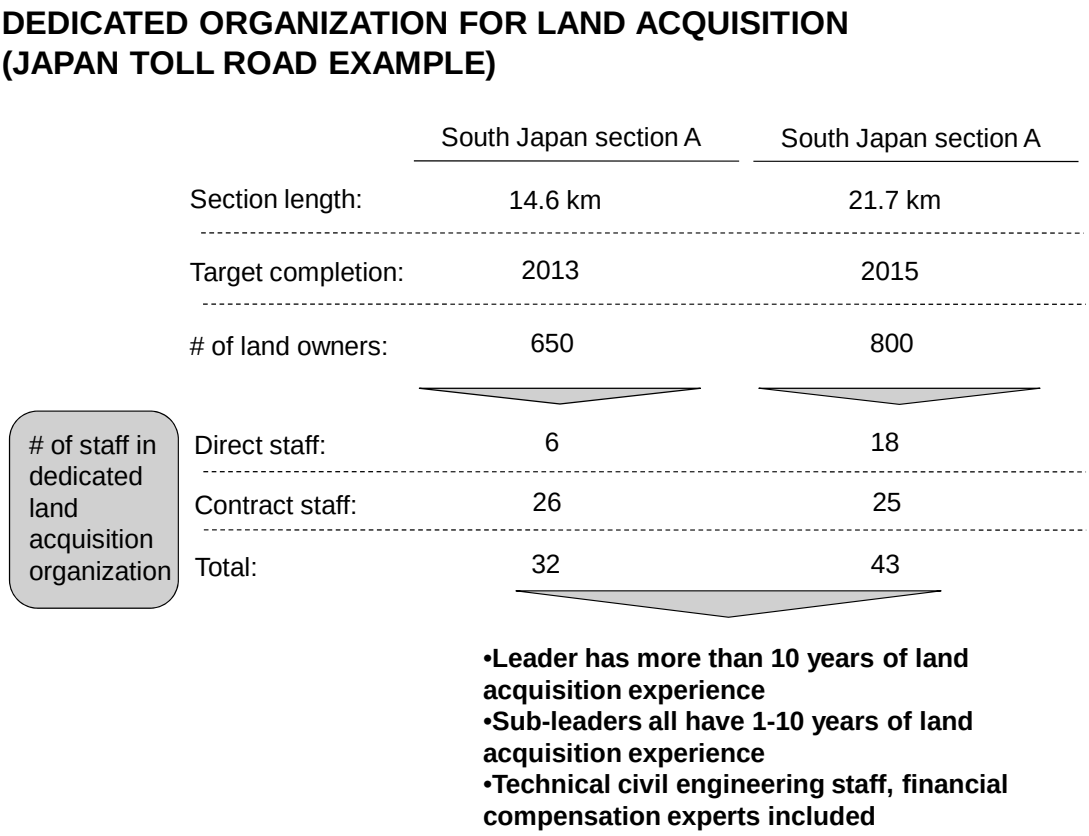
Figure 5.2.2.1 Land acquisition issues

As an example of such organization, Japan toll road case could be of great reference. Figure 5.2.2.2 describes actual on-going organization for land acquisition in southern part of Japan. It has several notable characteristics.

Dedicated unit. For a section of 10-20km in length, the organization has 30-40 fulltime dedicated staff. This is because land acquisition requires "door-to-door" tailored discussions with each land owner. In this case, there are 600-800 land owners to deal with.

Professional experience. Leader of such unit must have more than 10 years of land acquisition experience. Not only the leaders, sub-leaders all have prior relevant experience. Also, the unit has functional experts such as financial compensation calculation. This is because each land owner has different needs and tailored terms and conditions for compensation goes a long way in reaching amicable agreements. For example, some owners may be in need for quick cash payment .Others may be looking for alternative place to move.

Combine outsourcing. In this case, more than 60% of staff are contractors from private organization. This is also relevant for Indonesia as there are quite a number of private real estate developers with successful results.



Source: team interview

Figure 5.2.2.2 Land acquisition organization example

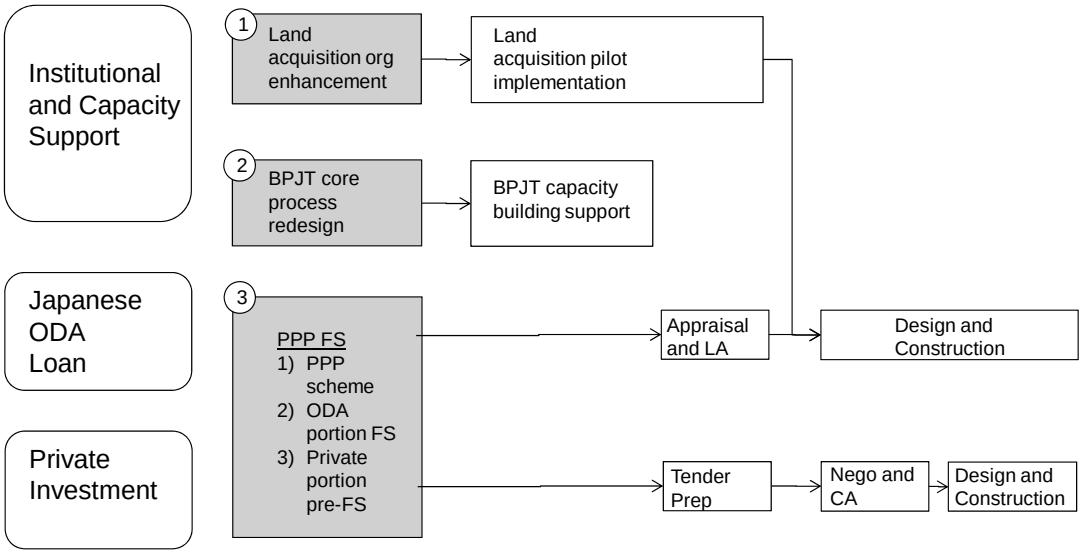
5.2.3 Next step roadmap for toll road

The study team suggests three parallel modules for immediate next steps.
1) Land acquisition organization enhancement
2) BPJT organization enhancement
3) PPP Feasibility Study

1-2 candidates will be selected from the 4-5 screened candidates described in chapter3. Selected candidate will move forward into PPP FS. However, this alone will not solve land acquisition and BPJT organization issues. Therefore, we recommend parallel efforts to accelerate the development of a successful model case.

Figure5.2.3 describes the ideal roadmap. It describes how organization enhancements to land acquisition and BPJT could lead to capacity building efforts, positioning the selected candidate as a "pilot project".

NEXT STEP ROADMAP FOR PPP TOLL ROAD



Source: team analysis

Figure 5.2.3 Next step roadmap for PPP toll road

5.2.4 Technical support modules for toll road

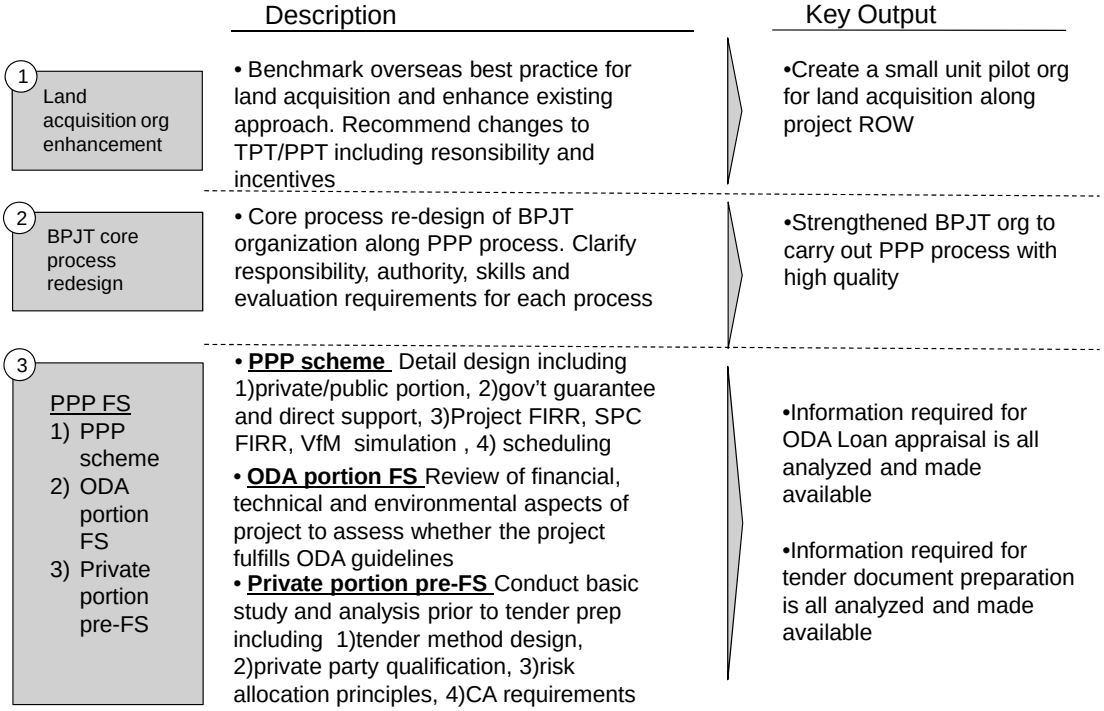
Figure5.2.4 describes the details of suggested next step modules. All three modules require 6-12 months in duration. Modules can be packaged together or implemented separately. What is important is to ensure government stakeholder's readiness to collaborate with these modules.

For land acquisition organization enhancement, overseas benchmarking of best practices will be the core element. Many countries have gone through similar issues that Indonesia faces today. Best practices for funding, land pricing,

socialization, negotiation and court settlement must be reviewed. Tangible changes to TPT/PPT organization should be recommended.
For BPJT organization enhancement, methodology for "core process re-design" should be adopted. Organization changes are not about re-writing organization boxes. It is about ensuring that core PPP process runs efficiently and effectively.

For PPP FS, it is critically important to acknowledge differences with conventional FS(or pre-FS). For example, PPP scheme, such as government support, must be designed in detail. Also, if vertical split PPP scheme is selected, ODA portion and private portion must be studied with different depth. ODA portion requires FS, including technical aspects. Private portion should be positioned as pre-FS.

DESCRIPTION OF NEXT STEP MODULES FOR TOLL ROAD



Source: team analysis.

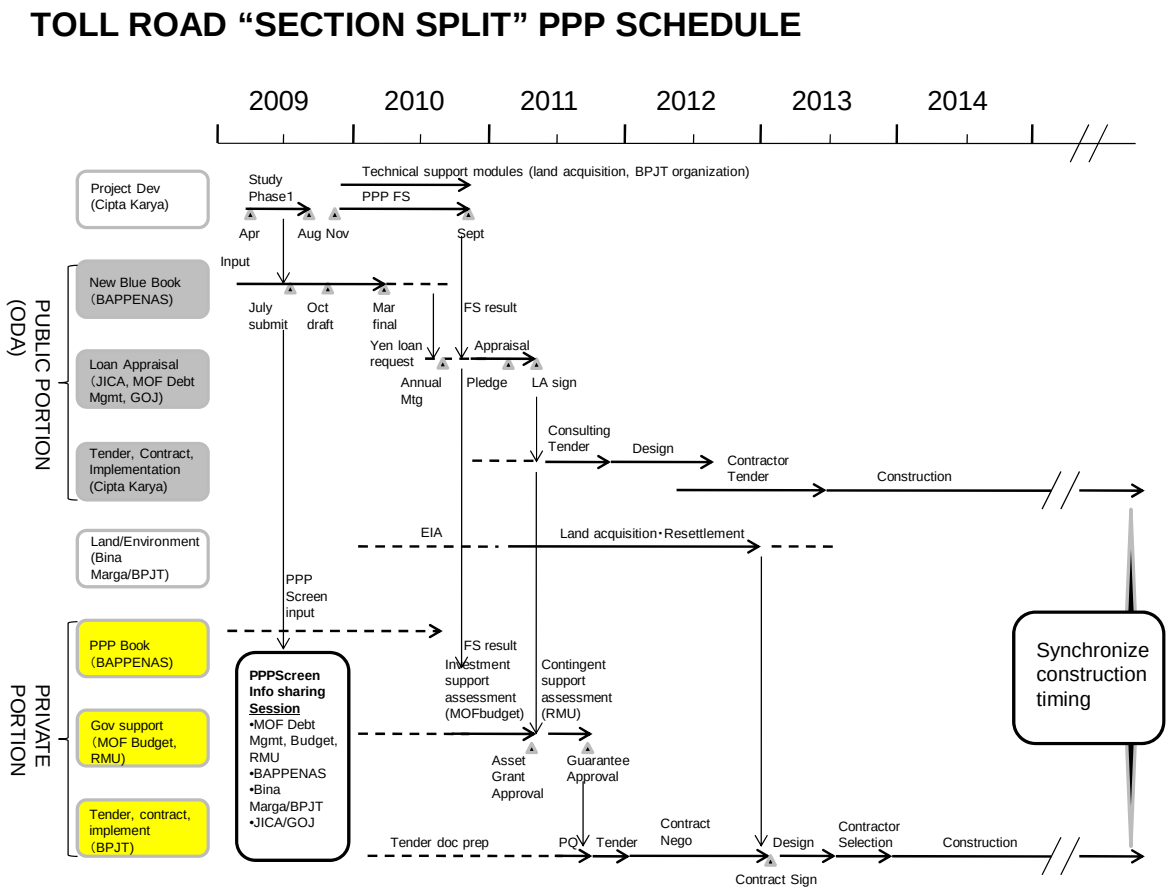
Figure 5.2.4 Next step modules for toll road

5.2.5 Schedule timeline for toll road

Schedule timeline for development of toll road PPP project model, based on this study results, is described in Figure5.2.5. It provides a macro holistic view of how next steps modules will feed into the bigger picture. It also describes linkages between public portion (ODA) and private portion.

Key schedules include,
1) Expected timing of Japanese ODA loan agreement: March 2011
2) PPP tender: Second half of 2011
3) Construction commencement: 2013

One important aspect of project scheduling is the synchronization of construction completion timing. This was mentioned repeatedly during our interviews with private investors. In this schedule, we have linked the timing of private tender to be several months after the LA signing. Other milestone linkages should be considered to minimize timing delays, especially on the public portion.



Source: team analysis

Figure 5.2.5 Schedule timeline for toll road

5.2.6 Details of next step modules

In the following, detail module descriptions for "Land Acquisition Organization Enhancement", "BPJT Core Process Redesign" and "PPP FS (Toll Road)" are provided. It is hoped that these next step modules will be owned and initiated by the Indonesian government. Support for next steps could be provided by various donors and international agencies, including JICA.

Land Acquisition Organization Enhancement

■ Background

- Land acquisition is one of the largest bottleneck for implementing infrastructure development project in Indonesia

- In toll road sector, there are 22 projects with significant schedule delays mainly due to issues of land acquisition
- Reasons behind delays are 1) lack of funds for land purchase, and 2) slow progress of negotiation with land owners
- In terms of funding, revision of Perpres 67 should specify the government's responsibility to provide funds for land
- On the other hand, negotiation with land owners will likely continue to be an issue because PPT/PTP organizations are not fully effective. It seems there are limitations of a part-time committee organization and lack of expert skills.

■ **Objective**

- Recommend dedicated land acquisition organization that can be practically implemented in Indonesia. To do this, benchmark overseas land acquisition organizations and best practice
- Reach consensus on specific actions to establish such dedicated land acquisition organization by coordinating stakeholder discussions. Agree to start a pilot testing of new organization by actual socialization and negotiation activities for a selected PPP toll road project

■ **Expected Impact**

- Organization to acquire land according to planned schedule will be ready to operate along ROW of selected PPP toll road project. Attract private investor's attention by explaining government's commitment to operate a credible dedicated organization.
- Acceleration of other pending toll road projects (e.g. 22 projects with signed CA)

■ **Activity**

- Research overseas organization cases and synthesize best practice. Focus on negotiation process techniques, organization responsibility, authority, incentives, skills and other factors.
- Synthesize current situation of PPT/PTP activities in Indonesia
- Design new dedicated organization
- Hold stakeholder workshops and discuss specific roadmaps for organization establishment, including launching a pilot program for selected PPP project

■ **Required resource**

- A dedicated team of 3-4 full-time experts. Duration 8~10 months
- Organization change expert, organization design expert, land acquisition expert, etc.

BPJT Core Process Redesign

■ Background

- Lack of BPJT capacity to fulfill contracting agency role is one of the key issues regarding PPP toll road project implementation
- This issue is not just about each individual staff's capacity. It is more about lack of institutional systems and organizational mechanisms to implement PPP core processes.
- More specifically, a fundamental review of key organizational elements such as system, staff, structure and skills are necessary.

■ Objective

- Redesign BPJT organization along PPP core processes
- Recommend new BPJT organization and communicate with relevant stakeholders. Agree to roadmap for organizational change.

■ Expected Impact

- PPP toll road project's tender preparation, tender and procurement, contract negotiation and contract management will be implemented under a new and renovated BPJT organization. This will significantly increase the chances of successful project implementation.

■ Activity

- Analyze BPJT current organization and synthesize organizational issues
- Redesign organization along PPP core process(job descriptions, required skills, number of staff etc.); 1)Project generation and screening, 2)Pre-FS and tender preparation, 3)Tender and procurement, 4)Contract negotiation, 5)Contract management
- Analyze new organizational structure and inter-relationships
- Develop several options for new BPJT organization
- Hold stakeholder workshops, select new organization option and agree to roadmap for change

■ Required Resource

- A dedicated team of 5-6full-time experts. Duration 8~10months
- Organization change expert, organization design expert, PPP expert, PPP operations expert (especially tender and procurement, contract negotiation), toll road expert

PPP FS (Toll Road)

■ Background

- PPP project for toll road has been discussed and planned for project sections with FIRR ranging between 12%~16%
- Based on comprehensive screening, section AB has been selected as potentially attractive candidate for PPP model case, using the "Section Split" scheme
- Successful implementation hinges on high quality PPP feasibility study, which is different from traditional infrastructure project feasibility study on the following aspects;
    1. Detail design of PPP scheme is required to define the public section funded by ODA and private section funded by private investors. Also, principles of government support and risk allocation must be defined. In addition, synchronization measures of public and private section schedules must be planned upfront
    2. For public section, FS will be done based on ODA guidelines. For private section, pre-FS will be done to develop an "information package" for potential private investors. This information package is not meant to guarantee accuracy of information but needs to be credible enough for investors to make a business judgment on tender participation
    3. PPP stakeholder coordination is much more complex than traditional projects. Coordination on areas such as funding, contingent support, direct support, land acquisition must take place during the course of PPP FS

■ Objective

- Design details of PPP scheme based on "Section Split" methodology and clarify the roles of public and private parties
- Conduct FS for public section based on ODA guidelines
- Conduct pre-FS for private section
- Reach consensus between PPP stakeholders on PPP scheme as well as roles of each party and roadmap for implementation

■ Expected Impact

- Sufficient facts and analysis are prepared and shared with PPP stakeholders to truly generate momentum towards implementation; 1) sufficient information to enter into ODA loan appraisal, 2) sufficient tender preparation to enter into tender and procurement of private investors, 3) principle approvals for required government support obtained

■ Activity

- Detail design of PPP scheme:

1. Define public section and private section, taking into account ODA standalone conditions and technical difficulties
2. Confirm accounting transaction for public section
3. Financial analysis of three viewpoints(PJT FIRR, SPC FIRR, GOI FIRR)
4. Confirm conditions for positive VfM
5. Design details of contingent support (Tariff, Volume)
6. Plan for synchronization of public and private section schedules

- Conduct FS for public section based on ODA guidelines
    1. Technical feasibility analysis
    2. Detail financial analysis
    3. Environment and social consideration analysis
- Conduct pre-FS for private section
    1. Preliminary assessment of technical, financial, environment and social considerations for private section (not as deep as public section)
    2. Development of "information package" for potential private investors
    3. Tender qualifications for private party(eliminate unnecessary barriers)
    4. Detail design of tender method
    5. Clarification of tender conditions
    6. Define principles of risk allocation
    7. Develop draft concession agreement
- Coordinate with PPP stakeholders (primarily work with BPJT, which will be the contracting agency)
    1. Coordination with Bina Marga on overall planning
    2. Documentation support for KKPPI registration
    3. Documentation and communication support with MOF RMU (contingent support), coordination on direct support and land acquisition budget with MOF Budget
    4. Coordination with BAPPENAS on Blue Book and PPP Book

■ **Required Resource**

- A dedicated team of 10 full-time experts. Duration 10months
- Overall PPP expert, PPP financial analysis expert, PPP operations expert, PPP legal expert, PPP investor relations expert, toll road planning expert, toll road technical design expert, toll road O&M expert, land acquisition expert, environment and social consideration expert. (in addition, toll road bridge design expert or tunnel design expert maybe needed if such project candidate is selected)

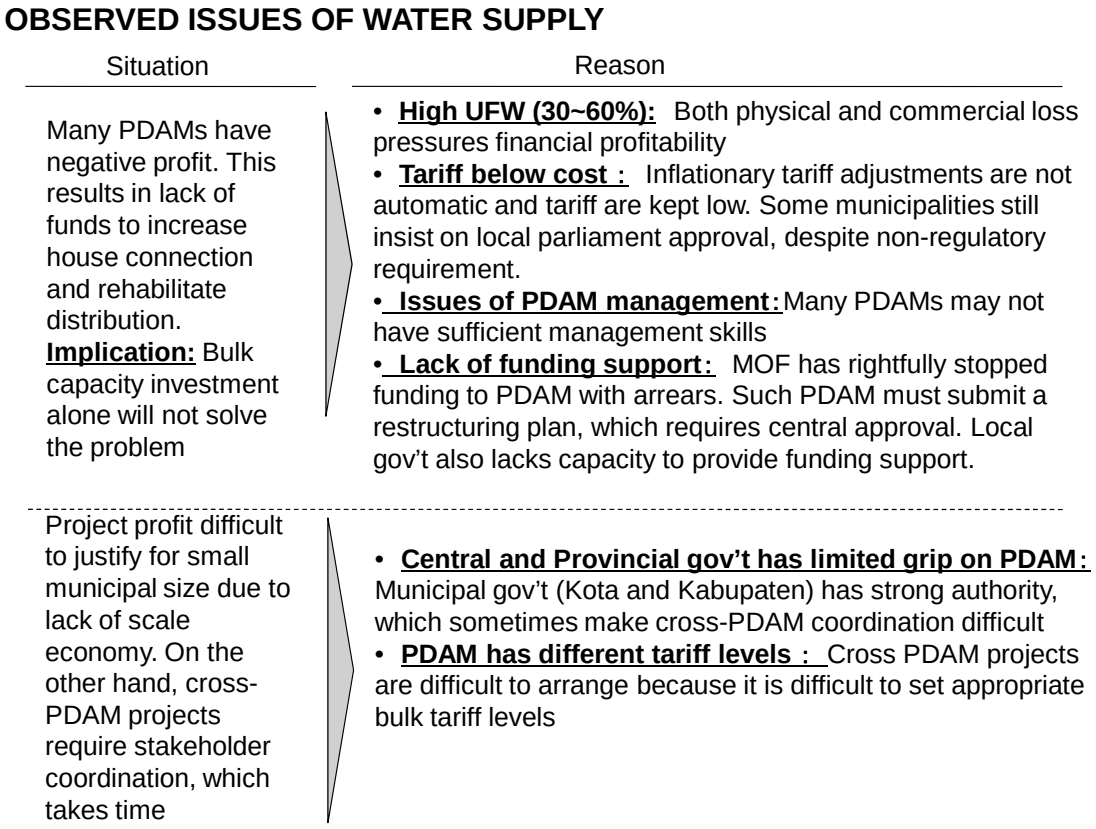
5.3 Water supply issues and recommendations for next steps

5.3.1 Summary of water supply issues

Before describing recommended next steps for water supply, following this study, we would like to recapture the essence of water supply issues. (Figure5.3.1)

First and foremost, it is important to point out issues regarding PDAM's financial sustainability. While some PDAMs are in good financial state, many suffer from high UFW and low tariff levels. This results in lack of funds to increase house connection. It jeopardizes one of Indonesian government's top priority target, which is to increase water supply coverage ratio. Therefore, PPP project to solely increase bulk water capacity is not going to work. The project needs to be "packaged" with means to enhance coverage ratio at the same time.

Also, structurally, it is important to point out that regional autonomy has made it difficult to generate large projects that cut across multiple municipalities. Large projects are essential for PPP because of the scale economy it provides. Therefore, stakeholder coordination (to form project consensus with multiple PDAMs and municipalities) becomes critically important.



Source: Team analysis

Figure 5.3.1 Summary of water supply issues

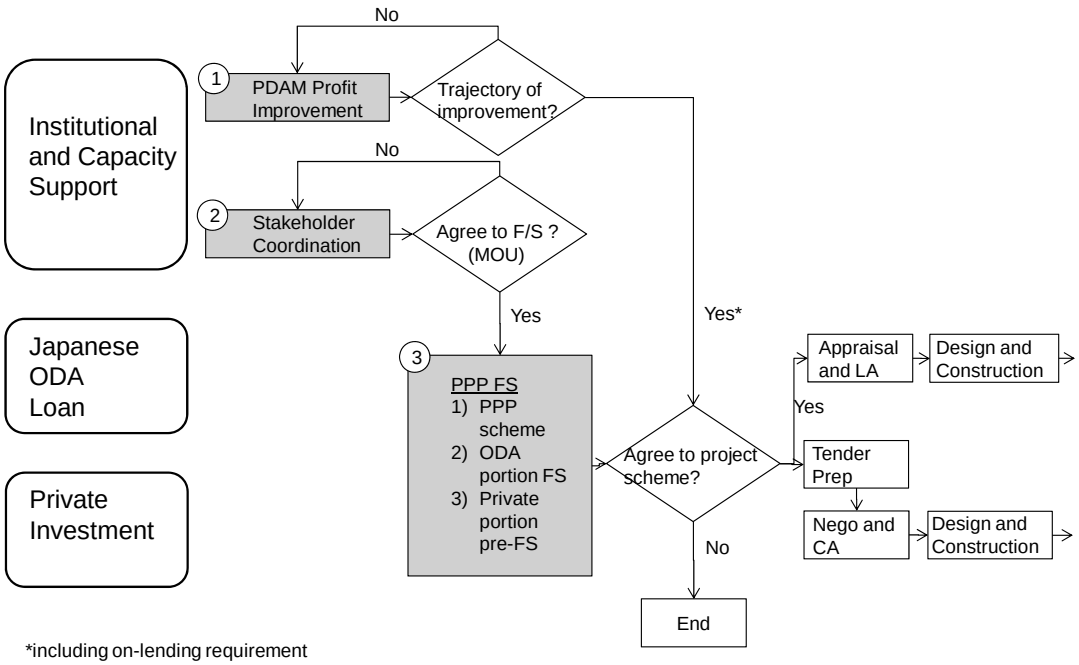
5.3.2 Next step roadmap for water supply

The study team suggests three parallel modules for immediate next steps.
1) PDAM profit improvement program
2) Stakeholder coordination
3) PPP Feasibility Study

1-2 candidates could be selected from the 3 screened candidates described in chapter4. Selected candidate will move forward into PPP FS. However, this alone will not ensure solutions to PDAM financial sustainability and stakeholder consensus. Therefore, we recommend parallel efforts to accelerate the development of a successful model case.

Importantly, milestones should be set to decide "go or no go" for the project to proceed. Two key milestones are; 1) Trajectory of PDAM profit improvement as a result of PDAM profit improvement program, 2) Stakeholder consensus of PPP scheme, ideally in the form of signed MOU, as a result of stakeholder coordination effort.

NEXT STEP ROADMAP FOR PPP WATER SUPPLY



Source: team analysis

Figure 5.3.2 Next step roadmap

5.3.3 Technical support modules for water supply

Figure5.3.3 describes the outline of suggested next step modules. Modules can be packaged together or implemented separately. What is important is to ensure

government stakeholder's readiness to collaborate with these modules.

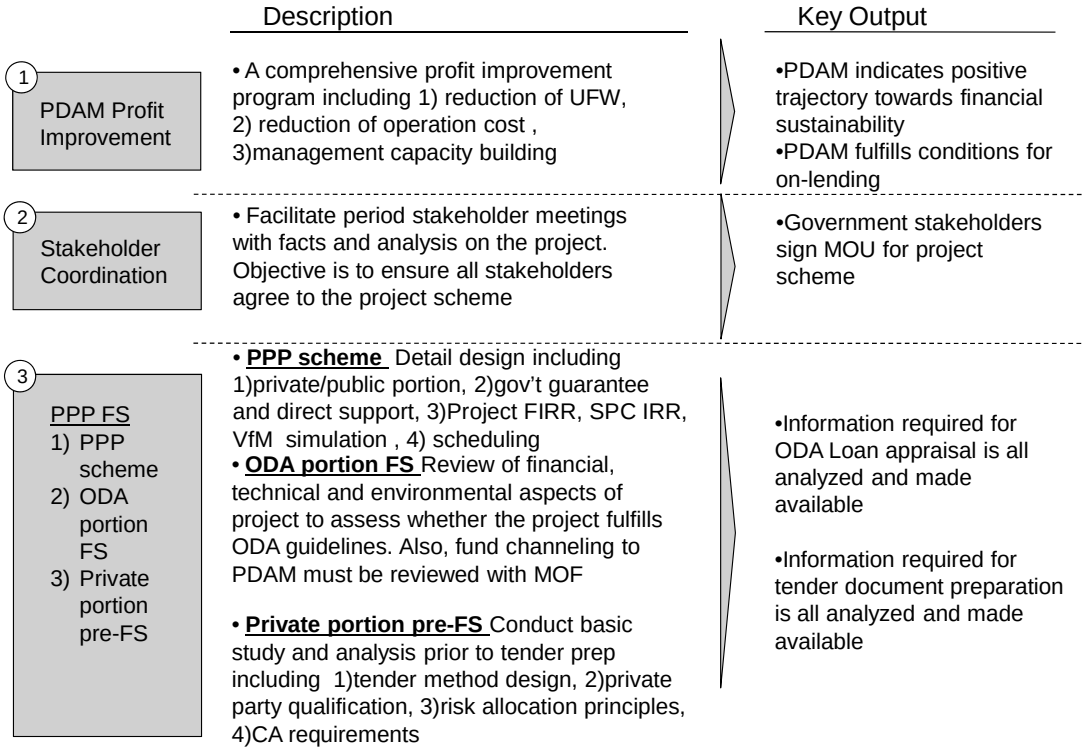
PDAM profit improvement program should initially focus on UFW reduction, since this will most likely have the largest impact on profitability. Physical and commercial loss should be handled separately with dedicated units. It is important to quantify the incremental profit and develop a mechanism to pool profits for distribution connection investments.

Stakeholder coordination should not be underestimated. This is especially true if cross-municipal project is selected. A clearly defined MOU on PPP scheme should be signed to avoid any ambiguity. Key is to clarify the merits for each party. For water supply, the direct merits of PPP are rather difficult to visualize for local governments and PDAMs. It is important to compare scenario of "with" and "without" PPP and clarify the tangible benefits of accelerated infrastructure development for local government and PDAM.

For PPP FS, similar to toll road, it is critically important to acknowledge differences with conventional FS(or pre-FS). Also, it is quite important to clarify how local government will regulate and monitor the performance of SPC operation. This should be included as one of key tasks during PPP FS. For example, roles of operation and maintenance should be clearly stated in CA and non-performance should be penalized by the local government as regulator.

Please refer to section 5.3.6 for further details of each next step module.

DESCRIPTION OF NEXT STEP MODULES FOR PPP WATER SUPPLY



Source: team analysis.

Figure 5.3.3 Next step modules for water supply

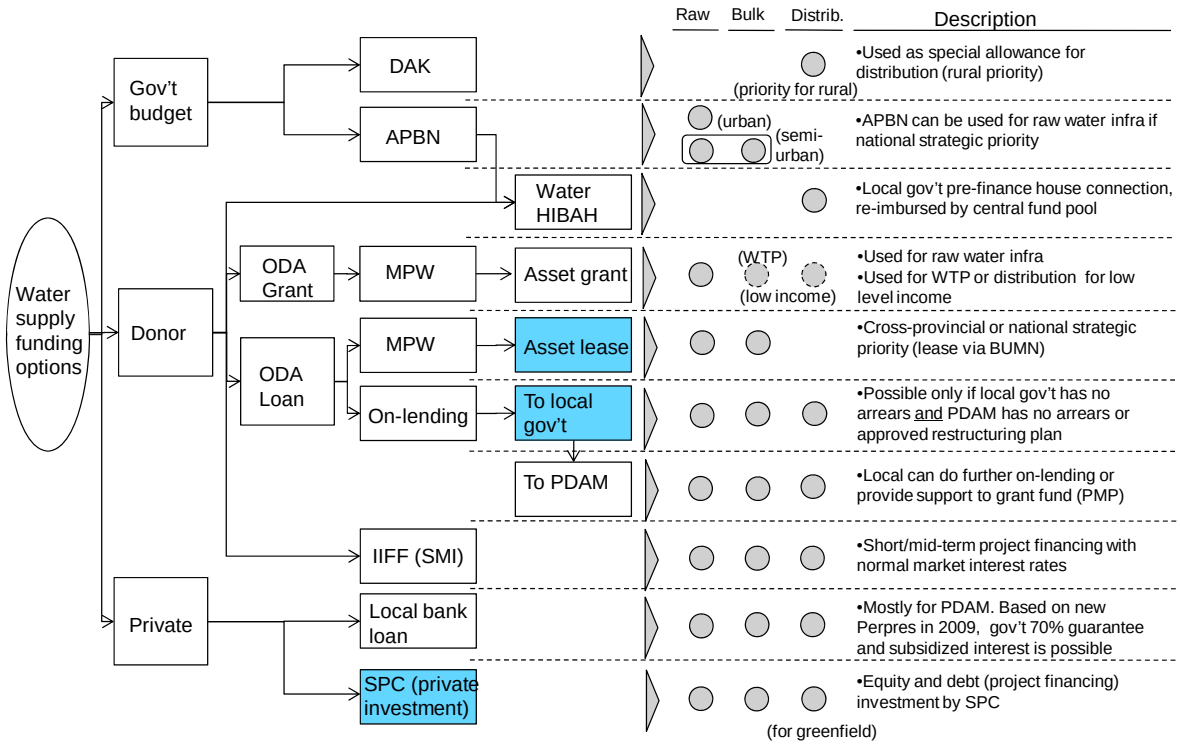
5.3.4 Considerations for fund channeling to water supply project

For PPP FS of water supply project, fund channeling discussions with MOF becomes one important element. Fund channeling options are described in Figure5.3.4. We need to clarify fund channeling method for both bulk and distribution.

For bulk ODA portion, which covers intake facility and all or part of WTP, central government (MPW) could design-build and lease the asset to future SPC. In this case, BUMN could be set up for asset ownership and management.

For distribution portion, if it will be funded by ODA loan, it will take the form of on-lending to local government, which will further channel funds to PDAM. In this case, conditions for on-lending will need to be discussed in detail with MOF, to fulfill on-lending regulations and policies. If distribution will not be funded by ODA loan, then, other means of funding must be secured for project to proceed. Perhaps, the new Perpres on support for bank loan may open avenues for private funding.

FUND CHANNELING OPTIONS FOR WATER SUPPLY



Source: team analysis.

Figure 5.3.4 Fund channeling options for water supply

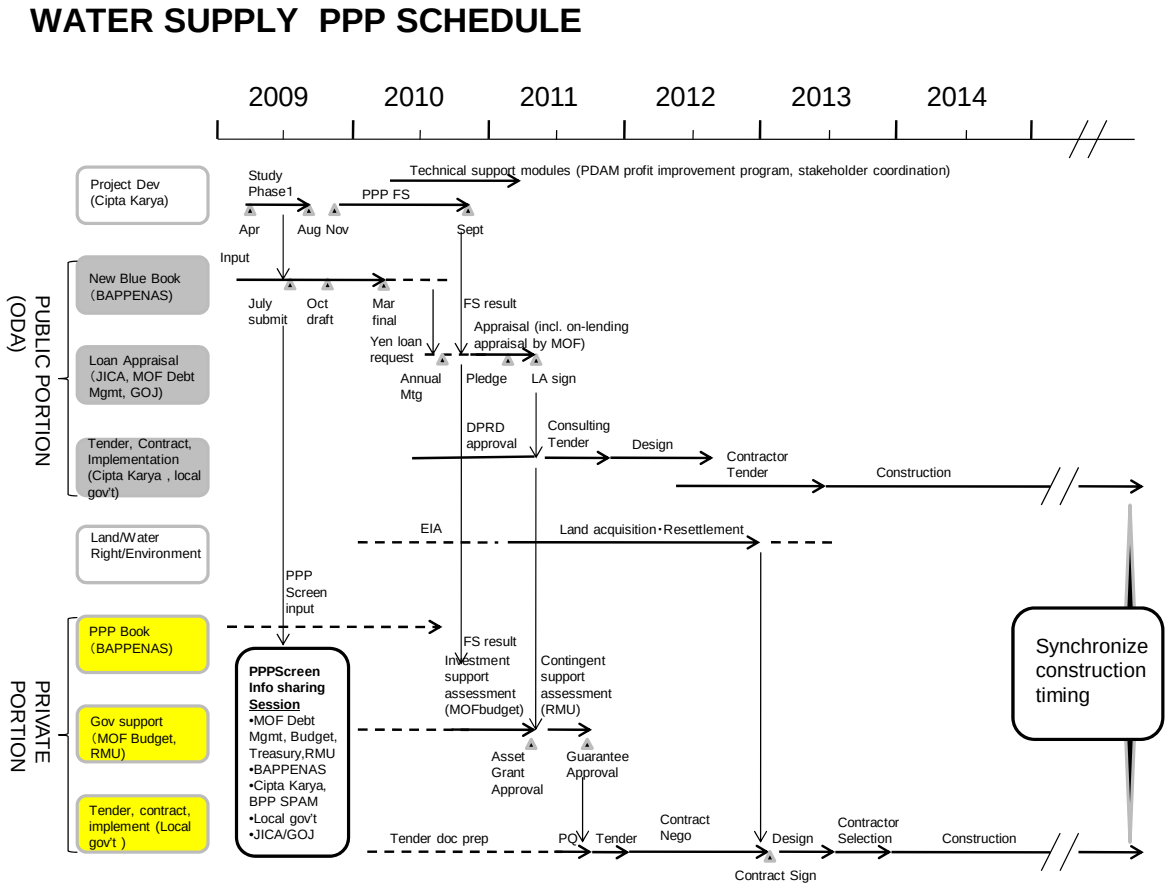
5.3.5 Schedule timeline for water supply

Schedule timeline for development of water supply PPP project model, based on

this study result, is described in Figure5.3.5. It provides a macro holistic view of how next steps modules will feed into the bigger picture. It also describes linkages between public portion (ODA) and private portion.

Key schedules include,
1) Expected timing of Japanese ODA loan agreement: March 2011
2) PPP tender: Second half of 2011
3) Construction commencement: 2013

Needless to say, this schedule is tentative and subject to change based on the key milestones mentioned in 5.3.2. To restate, trajectory of PDAM profitability improvement and stakeholder consensus must be fulfilled before LA or PPP tender could start.



Source: team analysis.

Figure 5.3.5 Schedule timeline for water supply

5.3.6 Details of next step modules

In the following, detail module descriptions for “PDAM profit improvement” and “PPP FS (Water Supply)” are provided. It is hoped that these next step modules will be owned and initiated by the Indonesian government. Support for next steps could be provided by various donors and international agencies, including JICA.

PDAM Profit Improvement Program

■ Background

- Private investors have indicated that the largest risk factor for PPP water supply project is PDAM's payment risk. In fact, many PDAMs in Indonesia suffer from financial difficulty and record negative profits.
- To cope with this situation, MOF has recently initiated a program to support the financial turnaround of PDAMs. PDAMs willing to join this program must submit a credible turnaround plan, which is reviewed and approved by MOF.
- In the packaged PPP scheme, funds for additional house connection shall come from ODA on-lending to local government. MOF's approval of turnaround plan is a pre-requisite for ODA on-lending appraisal by MOF.
- Therefore, profit improvement trajectory of PDAM within PPP project territory will be a necessary condition for PPP project implementation

■ Objective

- Target negative profit PDAM within PPP project territory
- Pull improvement levers such as UFW reduction, operation cost reduction and water tariff optimization. Demonstrate clear improvement trajectory towards annual positive profit. Then, develop organization mechanisms to sustain continuous improvements and strengthen management capacity
- In addition, develop clear plans for house connection coverage improvement, including a stock-take of existing distribution network, rehabilitation and coverage increase plan by sub-districts and financial plans

■ Expected Impact

- Provide credible profit improvement status information to potential private investors and attract interest towards PPP water supply project investment
- Ensure conditions to clear MOF's appraisal for on-lending to local government (which will further channel finds to PDAM)

■ Activity

- Diagnosis phase (3months), Solution phase (3months), Pilot implementation phase (6~12months)
- Diagnosis phase will extract improvement levers by analyzing each factor of profit equation in terms of comparison with other PDAMs, time trends and benchmarking. Thereafter, conduct interviews and workshops to analyze root cause.
- Solution phase will develop specific actions to tackle root causes of poor profitability and uplift financial performance. In addition, recommend organization mechanisms to sustain improvement activities on an on-going basis and reach consensus to start pilot implementation

- Pilot implementation phase will select specific sub-district and improvement theme and support 2-3 implementation activities. It is important to set quantitative improvement target and timing of achievement. Then, install periodic monitoring system to track results. This improvement activity itself should be designed so that sustainable organization mechanisms and capacity building will be achieved simultaneously. Specific improvement themes will differ by PDAM characteristics. Concrete themes should be selected. For example, "30% reduction of UFW physical loss in sub-district A".

■ **Required resource**

- A dedicated team of 3-4 full-time experts per PDAM. Duration 12-18months.
- Management turnaround expert, Water supply operations improvement expert (especially UFW reduction), Financial analysis expert, etc.

PPP FS (Water Supply)

■ **Background**

- PPP project for water supply has been discussed and planned in Indonesia with limited success thus far
- This is because water supply projects require solutions to both bulk capacity investment as well as distribution investments simultaneously, requiring a complex project scheme
- Based on comprehensive screening, project XY has been selected as potentially attractive candidate for PPP model case, using a packaged water supply scheme for both bulk and distribution
- Successful implementation hinges on high quality PPP feasibility study, which is different from traditional infrastructure project feasibility study on the following aspects;
    1. Detail design of PPP scheme is required to define the public section funded by ODA and private section funded by private investors. Also, principles of government support and risk allocation must be defined. In addition, synchronization measures of public and private section schedules must be planned upfront
    2. For public section, FS will be done based on ODA guidelines. For private section, pre-FS will be done to develop an "information package" for potential private investors. This information package is not meant to guarantee accuracy of information but needs to be credible enough for investors to make a business judgment on tender participation
    3. PPP stakeholder coordination is much more complex than traditional projects. Coordination on areas such as funding, contingent support,

direct support, land acquisition, on-lending requirements must take place during the course of PPP FS

- **Objective**

  - Design details of PPP scheme based on a packaged water supply scheme for both bulk and distribution
  - Conduct FS for public section based on ODA guidelines, including assessment of on-lending possibility for distribution
  - Conduct pre-FS for private section
  - Reach consensus between PPP stakeholders on PPP scheme as well as roles of each party and roadmap for implementation

- **Expected Impact**

  - Sufficient facts and analysis are prepared and shared with PPP stakeholders to truly generate momentum towards implementation; 1) sufficient information to enter into ODA loan appraisal, 2) sufficient tender preparation to enter into tender and procurement of private investors, 3) principle approvals for required government support obtained

- **Activity**

  - Detail design of PPP scheme:
    1. Define public section and private section, taking into account ODA standalone conditions, technical difficulties and funding for both bulk and distribution
    2. Confirm accounting transaction for public section covering both bulk fund channeling as well as distribution fund channeling which will most likely be on-lending to local government
    3. Financial analysis of three viewpoints (PJT FIRR, SPC FIRR, GOI FIRR)
    4. Confirm conditions for positive VfM
    5. Design details of contingent support (Tariff, Volume)
    6. Plan for synchronization of public and private section schedules
  - Conduct FS for public section based on ODA guidelines
    1. Technical feasibility analysis
    2. Detail financial analysis
    3. Environment and social consideration analysis
  - Conduct pre-FS for private section
    1. Preliminary assessment of technical, financial, environment and social considerations for private section (not as deep as public section)
    2. Development of “information package” for potential private investors
    3. Tender qualifications for private party(eliminate unnecessary barriers)

4. Detail design of tender method
5. Clarification of tender conditions
6. Define principles of risk allocation
7. Develop draft concession agreement

- Coordinate with PPP stakeholders (primarily work with the contracting agency)
    1. Coordination with Cipta Karya on overall planning
    2. Coordination with provincial government, municipal governments and PDAMs, including local government's role as regulator and on mechanisms to monitor the performance of SPC operations
    3. Documentation support for KKPPI registration
    4. Documentation and communication support with MOF RMU (contingent support), coordination on direct support and land acquisition budget with MOF Budget, coordination on on-lending criteria with MOF Treasury
    5. Coordination with BAPPENAS on Blue Book and PPP Book

■ **Required Resource**

- A dedicated team of 10 full-time experts. Duration 12 months
- Overall PPP expert, PPP financial analysis expert, PPP operations expert, PPP legal expert, PPP investor relations expert, water supply planning expert, water supply bulk facility technical expert, water supply transmission pipe technical expert, water supply distribution expert, environment and social consideration expert