

**Ministry of Public Works
Republic of Indonesia**

**Detailed Planning Survey for the Project for Sector
Survey on the PDAM Asset Management
In the Republic of Indonesia**

**Final Report
Summary**

September 2014

Japan International Cooperation Agency

**KRI International Corp.
Nihon Suido Consultants Co., Ltd.**

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1. Background and Objective

1.1 Background

(1) Issues of Water Supply Sector in Indonesia

Financial soundness of PDAMs¹ is a key to expand access to safe drinking water among urban population in Indonesia². However, most PDAMs across the country cannot meet such investment needs due to their weak financial conditions. The PDAM soundness evaluation by BPPSPAM³ shows 157 (48%) out of 328 PDAMs are still categorized as “Sick” or “Unhealthy” in 2012. Major factors of such situation are summarized as follows:

- Low water tariff level that cannot cover operational and capital costs
- High non-revenue water (NRW) rates
- Insolvency due to excessive debt derived from past donor projects

(2) Center of Excellence (COE) Program

The government of Indonesia (GOI) has been coping with this issue by implementing several financial and technical assistance programs such as Debt Restructuring Program (DRP) and PDAM Health Program.

Most recently, Directorate General of Human Settlement of Ministry of Public Works (Cipta Karya) has launched “**Center of Excellence**” (COE) Program, in which Cipta Karya provides Trainings-of-Trainers (TOT) type education to selected staff of “Healthy” PDAMs and these trainers (trained PDAM staff) give trainings to other PDAMs back in their home provinces. Recently in 2013 the COE Program has been implemented in eight provinces including those three provinces with PDAM activity monitoring and COE Trainer evaluation after TOT (South Sulawesi, Bali and North Sumatra)⁴. Cipta Karya has a plan for the nationwide expansion in near future.

(3) The Present JICA Survey

Japan International Cooperation Agency (JICA) has held several surveys and discussions with Cipta Karya to seek opportunity to support its efforts for capacity development of PDAMs toward their financial and operational soundness and the dissemination throughout the country.

Currently there is common understanding between both sides that the COE Program is a base instrument identified for a candidate JICA technical cooperation project in near future. However, more detailed information and analysis on COE is crucially necessary for JICA to elaborate the project design of its new assistance; hence JICA has decided to implement the present **Detailed Planning Survey**. Key preceding events and indicative schedule toward the project launching are summarized in the table below.

¹ *Perusahaan Daerah Air Minum* (regional water company) is a water utility provider owned by a regency or a city.

² The Millennium Development Goal (MDG) target for access to safe drinking water in urban area is 75.29% in 2015 while the actual access in 2011 was 40.52% which indicates large gap that requires massive and constant investments by PDAMs in remaining years.

³ *Badan Pendukung Pengembangan Sistem Penyediaan Air Minum* (National Agency for Water Supply System Development)

⁴ Only central-level TOT is implemented in BTAMS Region I and II (*Badan Teknik Air Minum dan Sanitasi* in Surabaya and Bekasi) for the remaining five provinces, i.e. North Sumatra, South Kalimantan, West Kalimantan, West Java and East Java.

Table 1 Preceding Events and Expected Schedule for New JICA Project

Month/ Year	Indonesian Side	Japanese Side
Jun 2009	Request for <i>PDAM Asset Management Project</i> by GOI	-
Apr 2010	-	Government of Japan (GOJ) pledged Technical Cooperation for <i>PDAM Asset Management Project</i>
Oct-Dec 2010	First Detailed Planning Survey for <i>PDAM Asset Management Project</i> by JICA	
Jul 2011	Discussions on the Project between Cipta Karya and JICA	
	<ul style="list-style-type: none"> - Agreed that broader coverage of PDAM management and operation issues is needed for the Project rather than mere "<i>Asset Management</i>", i.e. "<i>Progress Monitoring of Business Plan</i>", "<i>NRW Reduction</i>", "<i>Water Tariff</i>", "<i>Public-Private Partnership</i>", etc. - Pending issue was lack of instruments for nationwide dissemination of capacity development among PDAMs. 	
Sep-Oct 2012	Sector Survey on Water Supply Sector by JICA	
2012 – ongoing	Comencement of Center of Excellence Program	
	<ul style="list-style-type: none"> - Intends Nationwide PDAM capacity development through Training-of-Trainers 	
May-Jun 2013	Discussions on the Project between Cipta Karya and JICA	
	<ul style="list-style-type: none"> - Agreed on the upgrading and improvement of COE Program as the dissemination instrument for PDAM capacity development - Cipta Karya requested to include "Performance Based Contract" (PBC) that introduces private investment as an alternative financial source for capital investment needs among PDAMs 	
Mid 2013 - Early 2014	-	Preparation of Second Detailed Planning Survey for the Project
<u>Apr - May 2014</u>	<ul style="list-style-type: none"> ➤ <u>Second Detailed Planning Survey for the Project (1st Field Survey by Consultant Team)</u> - Detailed Study and Analysis of COE Project - Recommendations for Improvement 	
May - Jul 2014	-	Survey results analysis Finalization of project design
<u>Aug 2014</u>	<ul style="list-style-type: none"> ➤ <u>Second Detailed Planning Survey for the Project (2nd Field Survey) by JICA officials</u> - Project design discussion - Conclusion of Minutes of Meetings (M/M) 	
Oct-Nov 2014 (Tentative)	-	Approval on Project Design
	Conclusion of Record of Discussions (R/D)	
	-	Preparation of implementation Procurement of consulting services
Apr 2015 (Tentative)	Commencement of JICA Technical Cooperation Project	

(Source: JICA information)

The present survey is a part of JICA's Detailed Planning Survey for preparation of the said JICA project to reinforce and upgrade the COE Program. The project originally requested by GOI in 2009 was intended to develop operation and maintenance capacity for the asset management of PDAMs in order to improve their financial conditions; however, asset management is not emergency needs for PDAMs. Through the previous discussions, it is agreed at the present that current focuses are (i) Improvement of COE Program as the dissemination instrument for PDAM capacity development in order to improve financial conditions of PDAMs; and (ii) broader coverage of capacity development among PDAMs related to their financial soundness such as NRW reduction, customer management including billing and collection system, introduction of private investment through Performance Based Contract (PBC), customer management, etc.

1.2 Survey Objective

For preparation of the said technical cooperation project, the present Detailed Planning Survey was conducted by a consultant team with the following objectives:

- Collect and analyze detailed information of the present COE Program on its relevance to sector policy, training contents, institutional setup, monitoring mechanism, needs for new training modules, impact and challenges of COE, examples of PBC, good practices of improved PDAMs, etc.
- Elaborate upgrading strategy for COE Program including introduction of new training modules and operational improvement
- Provide advisory and recommendations for JICA's project design of the technical cooperation based on the survey findings

1.3 Survey Methodology

(1) JICA Study Team

Position	Expert's Name (Firm)
Water Supply Management/ Team Leader	Mr. Yusaku MAKITA (KRI International Corp.)
Human Resource Development/ Capacity Building	Mr. Yoshiaki YOKOTA (Nihon Suido Consultants Co., Ltd.)

(2) Survey Schedule

1	Mon, Mar 31	Tokyo ⇒ Jakarta (GA885)
2	Tue, Apr 01	9:40 Cipta Karya (Kick-off Meeting) 16:00 JICA Indonesia Office
3	Wed, Apr 02	10:00 DITPAM Cipta Karya (COE Program)
4	Thu Apr 03	8:00 BPP SPAM
5	Fri, Apr 04	9:00 YPTD 13:30 PERPAMSI
6	Sat. Apr 05	Collected data survey and analysis
7	Sun, Apr 06	Collected data survey and analysis
8	Mon, Apr 07	Jakarta⇒ Surabaya (GA304) 10:00 BTAMS Region II (Surabaya Training Center) Surabaya⇒ Malang (Land Transport)
9	Tue, Apr 08	10:00 PDAM Kota Malang
10	Wed, Apr 09	Malang⇒ Surabaya (Land Transport) Surabaya ⇒Jakarta (GA315)
11	Thu, Apr 10	11:00 Embassy of the Netherlands 13:30 DITPAM Cipta Karya (COE Program)
12	Fri, Apr 11	9:00 ADB Indonesia Office
13	Sat, Apr 12	Collected data survey and analysis
14	Sun, Apr 13	Jakarta⇒ Makassar (GA610)
15	Mon, Apr 14	9:00 PDAM Kab. Maros 14:00 PIP2B South Sulawesi
16	Tue, Apr 15	10:00 PDAM Kab. Takalar
17	Wed, Apr 16	10:00 PDAM Kab. Pangkajene Dan Kepulauan
18	Thu, Apr 17	Makassar⇒ Denpasar (GA621)
19	Fri, Apr 18	Collected data survey and analysis

20	Sat, Apr 19	Collected data survey and analysis
21	Sun, Apr 20	Collected data survey and analysis
22	Mon, Apr 21	9:00 PDAM Kota Denpasar 13:30 PIP2B Bali
23	Tue, Apr 22	10:00 PDAM Kab. Badung 14:00 PDAM Kab. Tabanan
24	Wed, Apr 23	10:00 PDAM Kab. Gianyar 13:00 Satker PKPAM Bali Denpasar ⇒ Jakarta (GA419)
25	Thu, Apr 24	16:00 JICA Indonesia Office
26	Fri, Apr 25	13:30 PIP2B Pusat Cipta Karya
27	Sat, Apr 26	Collected data survey and analysis
28	Sun, Apr 27	Jakarta ⇒ Palembang (GA110)
29	Mon, Apr 28	8:00 PDAM Kota Palembang 13:00 Satker PKPAM South Sumatera
30	Tue, Apr 29	9:30 PDAM Kab. Banyu Asin 12:30 Government of Kabupaten Banyuasin 15:30 PIP2B South Sumatera
31	Wed, Apr 30	9:30 PDAM Kab. Ogan Ilir Palembang ⇒ Jakarta (GA115)
32	Thu, May 01	Collected data survey and analysis
33	Fri, May 02	Collected data survey and analysis
34	Sat, May 03	Collected data survey and analysis
35	Sun, May 04	Collected data survey and analysis
36	Mon, May 05	14:00 World Bank Indonesia Office
37	Tue, May 06	11:00 COE National TOT (Bandung)
38	Wed, May 07	15:30 Subdirectorate of Investment, DITPAM Cipta Karya
39	Thu, May 08	10:00 DITPAM Cipta Karya (COE Program) 16:00 COE National TOT Instructors (Bandung)
40	Fri, May 09	Collected data survey and analysis
41	Sat, May 10	Collected data survey and analysis
42	Sun, May 11	Collected data survey and analysis
43	Mon, May 12	10:00 BTAMS Region I (Bekasi Training Center)
44	Tue, May 13	13:00 DITPAM Cipta Karya 16:00 JICA Indonesia Office Jakarta ⇒ (GA886)
45	Wed, May 14	⇒ Tokyo

(3) Major Interviewees

Directorate of Water Supply Development (DITPAM), Directorate of Human Settlement (Cipta Karya) Ministry of Public Works	
Subdirectorate of Institutional and Regulatory Framework	- Mr. Hilwan, Head - Ms. Luky Retno Andayani, Head. Subdivision of Institutional Development
Subdirectorate of Investment	- Ms. Meike Kencanawulan, Head
Directorate of Human Settlement (Cipta Karya), Ministry of Public Works (PIP2B Pusat)	
PIP2B Pusat	- Mr. Daru Sukamto, Staff of Sub-directorate of Water Supply - Mr. Teddy Kreswanto, Staff of Task Unit for Program and Budget Control for Setditjen
Related Organizations	
BPPSPAM	- Ir. Rina Agustin Indriani, Secretary
PERPAMSI	- Ir. H. Agus Sunara, Executive Director - Mr. Dwiki Riantara, Head of Training and Partnership

YPTD PAMSI	- Mr. Rama Boedi, Chairman
BTAMS Region I (Bekasi Training Center)	- Mr. Ilham Muhargiady, Head
BTAMS Region II (Surabaya Training Center)	- Mr. Yusrizal HS, Head
Provincial Level (Satker and PIP2B)	
Satker PBL Bali	- Mr. I Putu Agra
Satker PK PAM Bali	- Mr. I Nyoman Sumberyasa, Institutional and Investment Assistant
Satker PK PAM South Sumatera	- Mr. Adam, Head of Institutional and Investment Assistant
PIP2B South Sulawesi	- Mr. Hamrun, Head
PIP2B South Sumatera	- Mr. Duhara, Head of Subdivision for Administration
PDAM	
PDAM Kota Malang	- Ir. Teguh Cahyono, Technical Director - Mr. Mifhatul Munir, Administration and Finance Director
PDAM Kabupaten Maros	- Mr. Abdul Baddar, Director
PDAM Kabupaten Takalar	- Mr. Syamsul Kamar Dg. Timung, Director
PDAM Kabupaten Pangkajene dan Kepulauan	- Mr. Kamaruddin, Head of Administration and Finance Division
PDAM Kota Denpasar	- Mr. I Putu Yasa, Head of Division for Research and Development
PDAM Kabupaten Badung	- Mr. Ida Bagus Gede Wimbardi, Director of Technical
PDAM Kabupaten Tabanan	- Mr. Ida Bagus Oka Sadana, President Director
PDAM Kabupaten Gianyar	- Mr. I Wayan Suastika, PLT (Acting Head) of Research and Development
PDAM Kota Palembang	- Mr. Andi Wijaya, Director for Operation and Marketing
PDAM Kabupaten Banyuasin	- Ir. Bakri, MT, Director
PDAM Kabupaten Ogan Ilir	- Mr. Zulkarnain, Director
Donors	
World Bank	- Mr. Fook Chuan, Sr. Water & Sanitation Specialist
Asian Development Bank (ADB)	- Mr. Paul van Klaveren, Senior Urban Development Specialist (Water Supply and Sanitation), Urban Development Water Division, Southeast Asia Department
Embassy of the Netherlands	- Mr. Peter de Vries, First Secretary (Water Management), Economic Department
Others	
Multi Karadiguna Jasa, PT. (MKJ) (COE Program Management Consultant)	- Ir. Raminatha Puizi Uno

(4) Survey Methodology

Interview survey was held with the parties mentioned above and the related information and data were collected and analyzed by the JICA Survey Team.

2. Planning of COE Program

2.1 Policy Context

(1) Purpose and Goals of COE Program

According to the Final Report of COE Program 2013, the program's purpose and goals are identified as follows:

- **Purpose of COE Program:** To accelerate PDAM restructuring program through increasing in human resource capacity in an effective and efficient manner.
- **Goals of COE Program:**
 - (i) Create professional trainers through the TOT program in which the participants are the highly selected from their respective PDAMs.
 - (ii) Selected trainers will then be mentors to do the technical assistance (BINTEK) to other PDAM recipients, etc.
 - (iii) Revive the PIP2B function as a Cipta Karya Technical Information Center.

(2) Positioning in Water Supply Sector Policy

According to Cipta Karya, the background of introduction of COE Program is as follows. Human recourse capacity is very limited among PDAMs throughout the country regardless of their soundness status. There is urgent need for capacity development of PDAMs in order to implement the Cipta Karya's sector assistance measures. The existing BTAMS (Water Supply Training Centers) in Bekasi and Surabaya have very limited training capacity so that Cipta Karya estimates it would take over 10 years to do the necessary training for all the PDAM staff nationwide. There has been urgent need for expansion of training capacity in such areas as NRW reduction and energy efficiency that directly related to PDAMs' performance.

Based on the abovementioned, in 2013 Cipta Karya launched the COE Program in which Cipta Karya provides Trainings-of-Trainers (TOT) type trainings to selected staff of PDAMs and these trainers (trained PDAM staff) give trainings to other PDAMs back in their home provinces.

In December 2013, the Ministry of Public Works established the National Policy and Strategies on Water Supply (No.13/PRT/M/2013), in which the COE Program is positioned as one of the PDAM assistance programs.

2.2 Planning and Budgeting

(1) Mid-term Plan

Trainings of COE Program were implemented in Provinces of South Sulawesi and South Sumatera in 2012 and expanded to cover Bali Province in 2013 (TOT trainings are held in eight provinces including these three). The program is planned to expand further to cover 31 provinces throughout Indonesia from 2014. Since the program was commenced in 2012, it was not mentioned in the current five-year plan (RENSTRA 2010-2014) of Cipta Karya and will be included in the next five year plan (2015-2019) under the new administration elected in mid 2014. According to its officials, Directorate of Water Supply Development plans to establish the Master Plan of COE Program around October 2014.

(2) Budget

In both 2012 and 2013, about Rp. 2 billion of the national budget was allocated for the implementation of the COE program. Around Rp.20-21 billion budget is allocated for the implementation in 2014 to cover (i) COE management consultant, instructors and module development; (ii) socialization activities in provinces; and (iii) TOT and BINTEK in 31 provinces.

4. Implementation of COE Program

4.1 Implementation Flow

COE Program is implemented through the following four stages:

- 1) Socialization (Promotion for PDAMs)
- 2) TOT (Training of Trainers)
- 3) Monitoring
- 4) BINTEK Training

Since its commencement in 2012, the program has evolved its scale and coverage. The table below shows the results of 2012 and 2013 trainings and the plan for the 2014 trainings.

Table 2 Training Results and Plan from 2012 to 2014

No.	Item	2012 (Actual)	2013 (Actual)	2014 (Plan)
1	Socialization for PDAMs	Two Provinces (South Sulawesi and South Sumatera)	One Province (Bali)	28 Provinces
2	Provincial TOT Venues	PIP2B in South Sulawesi and South Sumatera	BTAMS Region I (Bekasi) and Region II (Surabaya)	BTAMS Region I (Bekasi) and Region II (Surabaya)
3	BINTEK Training Venues	PIP2B in South Sulawesi and South Sumatera	PIP2B in South Sulawesi, South Sumatera and Bali	PIP2B and others
4	Training Modules for TOT and BINTEK	Two modules	Three modules	Three modules (Only NRW module for BINTEK in 25 provinces)
5	Provincial TOT participants (capacity) per module	Four participants	15 participants	15 participants
6	BINTEK participants (capacity) per module	Four participants	10 participants	10 participants
7	Provinces of TOT Participants	Two Provinces (South Sulawesi and South Sumatera)	Eight Provinces (South Sumatera, North Sumatera, South Kalimantan, West Kalimantan, West Java, South Sulawesi and Bali)	31 Provinces
8	Provinces of BINTEK Participants	Two Provinces (South Sulawesi and South Sumatera)	Three Provinces (South Sulawesi, South Sumatera and Bali)	31 Provinces
9	PDAM conditions required for TOT participants	None	Healthy PDAM	Open to non-healthy PDAMs (tentative)
10	Psychological Testing for Trainer Selection	Not adopted	Adopted	Adopted

(Source: JICA Study Team based on Cipta Karya information)

4.2 TOT and BITEK Trainings

TOT and BINTEK trainings carried out in 2012 and 2013 are summarized as in the following tables.

Table 3 Provincial Trainers Qualified in TOT Trainings

Module	2012	2013	Total
NRW	2	12	14
Energy Efficiency	2	9	11
SAK ETAP	4	17	21
Total	8	38	46

(Source: JICA Study Team based on Cipta Karya Information)

Table 4 BINTEK Trainings in 2013

Province	Date	Participants and Participating PDAMs		
		NRW	Energy Efficiency	SAK ETAP
South Sulawesi	September 2 – 5, 2013	6 PDAM 10 persons	5 PDAM 9 persons	8 PDAM 10 persons
South Sumatera	September 9 – 12, 2013	8 PDAM 10 persons	6 PDAM 7 persons	6 PDAM 8 persons
Bali	September 16 – 19, 2013	6 PDAM 8 persons	6 PDAM 8 persons	4 PDAM 6 persons
Total		28 persons	24 persons	24 persons

(Source: JICA Study Team based on Cipta Karya Information)

5. PDAM Performance and COE Program

5.1 Performance of Interviewee PDAMs

The table below shows the operational performance of PDAMs interviewed in the field survey. It is indicated that larger PDAMs in scale tend to be operated more efficiently. Number of employees ranges from 44 to 577 which implies large gap in human resource capacity among PDAM.

Table 5 Operational Performance of Interviewee PDAMs

Province	PDAM	Latest Data	Soundness	Connections	Employees	Employees per 1000 connections	Operation Ratio*	Average Tariff Rp./m3	NRW Rate	Solvency**
SUMSEL	Kota Palembang	2013	N/A	224,065	577	2.6	0.7	4,225	24.9%	255.6%
JATIM	Kota Malang	2012	Healthy	116,184	409	3.5	0.7	3,889	34.7%	820.7%
BAJU	Kota Denpasar	2012	Healthy	71,664	238	3.3	0.9	3,087	31.1%	90.4%
BAJU	Kab. Gianyar	2013	N/A	51,115	246	4.8	0.9	3,732	45.7%	628.0%
BAJU	Kab. Tabanan	2012	Healthy	46,594	316	6.8	0.9	3,400	28.4%	185.6%
BAJU	Kab. Badung	2011	Healthy	32,017	218	6.8	0.8	4,236	22.4%	260.3%
SUMSEL	Kab. Banyuasin	2012	Less Healthy	12,262	93	7.6	1.6	2,475	35.2%	N/A
SULSEL	Kab. Maros	2012	Healthy	11,050	103	9.3	1.0	4,281	35.2%	92.3%
SULSEL	Kab. Takalar	2012	Healthy	8,322	52	6.2	1.2	3,251	20.9%	2964.3%
SULSEL	Kab. Pangkajene dan Keplauan	2012	Less Healthy	7,468	67	9.0	1.0	4,176	30.2%	26.8%
SUMSEL	Kab. Ogan Ilir	2012	Less Healthy	4,168	44	10.6	1.8	1,593	19.6%	39264.7%

* Operation Ratio = Operating cost/ Operating revenue

** Solvency = Total Assets / Total Debt

(Source: JICA Study Team based on PDAM Performance Audit Reports)

5.2 PDAM Interview Survey Results

(1) PDAM Management Officials

In general all the interviewed PDAMs understand necessity and urgency of capacity development of operational staff and appreciates the trainings of COE Program especially its accessibility and capacity for smaller-scale PDAMs in provincial areas.

- One of the most frequent challenges faced by PDAMs is funding for capital investment and proposal for central government assistance. In this respect JICA Study Team heard their needs for new training module for business plan preparation.
- For the existing training modules (NRW and Energy Efficiency), small-scale PDAMs expressed their needs for knowledge on the practical measures that are applicable to their actual operational and resource conditions.
- Currently there are no financial or other incentives given to the PDAMs which dispatch the Provincial and National Trainers for COE Program. However, the participating PDAMs appreciate the indirect merit by participating in COE such as elevating their presence in PDAM community as well as better relation with the central government (Cipta Karya).

Table 6 Comments on COE by PDAM Management Officials

PDAM	Title	Major Comments
Kota Malang	Director of Administration and Financial Division	<ul style="list-style-type: none"> ● The PDAM's financial issue is its limited source fund for capital investment. ● The water tariff has not been increased for five years. ● PDAM did a distribution network expansion project with funds borrowed through the government's interest subsidy facility (Presidential Decree No.29/2009). ● Participation in COE Program is considered favorable as opportunity to show the PDAM's presence in the PDAM community and good relationship with Cipta Karya.

Kabupaten Maros	PDAM Director	<ul style="list-style-type: none"> ● An additional training module for Business Plan preparation is necessary to make proposal to Cipta Karya for funding for distribution network projects. ● The PDAM is willing to cooperate with COE Program but it is difficult for the candidate to participate in National TOT due to his daily assignment at the PDAM. ● An additional training module in distribution network analysis and planning is requested to improve the PDAM's NRW team activities.
Kota Denpasar	Head of Research & Development Division	<ul style="list-style-type: none"> ● The PDAM continues to be supportive to the COE Program. ● It is observed that the COE participants from the PDAM acquired new knowledge and skills in relevant topics and presentation. ● COE Program is deemed beneficial to the PDAM which achieved NRW reduction target.
Kabupaten Banyuasin	PDAM Director	<ul style="list-style-type: none"> ● The human resource improvement is achieved through the COE Program. ● The PDAM management wants to continue having its staff participate in the program.
Kabupaten Ogan Ilir	PDAM Director	<ul style="list-style-type: none"> ● The PDAM strongly expect the COE Program to continue; it is necessary for the PDAM to enhance its staff's capacity development. ● It is expected that the COE Program will focus on the issues of small-scale PDAMs. ● Duration of trainings should be longer. ● More practice sessions are expected in the trainings, ● More case studies are expected from small-scale PDAMs. ● Willing to send the staff to on-the-job trainings in other advanced PDAMs. ● The PDAM lacks equipment to implement activities after trainings. ● Training modules for management officials are expected.

(Source: JICA Study Team based on PDAM Interviews)

(2) Training Participants (PDAM Staff)

Participants of COE trainings highly appreciate their training experience in general.

In terms of the training curriculum, many said they would like more field practice and case study rather than theoretical study in class.

TOT participants in NRW and Energy Efficiency modules were required to make project proposals to their home PDAMs in the relevant topics. However, it is quite difficult to make effective proposals and implement them due to the following reasons:

- It is not possible to put in actual practice the knowledge and skills learned in the TOT due to limitations such as lack of tool and equipment, etc.
- Only the TOT participant alone cannot implement the technique. It requires organized team efforts by PDAM staff with same level of knowledge.
- Lack of knowledge on project planning and proposal based on the better technique learned in the COE trainings.

As a result of the abovementioned, only participants from Healthy PDAMs can actually implement their own proposal after the TOT. They proposed a part of the existing improvement plan in their home PDAMs.

NRW

- BINTEK participants from small PDAMs said they could not implement the DMA establishment after the training due to lack of resources and equipment.

- On the other hand, large-scale PDAMs often have NRW reduction teams in their organization and applied the skills and knowledge learned in the trainings in the actual activities on the field.
- BINTEK participants pointed out the shortage of the tools used in the trainings were provided by the central management of COE Program.

Table 7 Comments of COE Training Participants (NRW)

Course	PDAM	Title	Education	Major Comments
Provincial TOT	Kota Malang	Manager of NRW Active Leakage Control for East Region	Bachelor's	<p>(Participated in EE trainings)</p> <ul style="list-style-type: none"> ● BTAMS II has good classrooms but the dormitory facility is not good. ● Classroom training is good but case studies are insufficient. ● The COE management does not provide Certificates to participants. ● Equipment and tools are insufficient in BINTEK trainings.
Provincial TOT	Kabupaten Maros	Staff for Distribution	-	<ul style="list-style-type: none"> ● Learned the knowledge on the NRW reduction measures. ● Former JICA project provided the detection tools for PDAM Maros but it still lacks funding for capital investment in pipe replacement and rehabilitation.
BINTEK	Kabupaten Takalar	Head of Subdivision Transmission & Distribution	-	<ul style="list-style-type: none"> ● Leaned about leakage detection methods. ● Training duration is too short. ● After the trainings, PDAM measures NRW every month. ● Meter replacement was executed after trainings. ● Response to water leakage has become timely. ● The COE management does not provide Certificates.
BINTEK	Kabupaten Pangkajene dan Kepulauan	Head of Technical Division	High School	<ul style="list-style-type: none"> ● Instructors, training materials and venue are all good. ● Training duration is too short.
Provincial TOT BINTEK	Kota Denpasar	Sub-Division Head of Distribution Network & Maintenance	High School	<ul style="list-style-type: none"> ● TOT Training contents and instructors are good; but the duration is too short. ● Funding for meter installment is a problem in Denpasar after DMA establishment. ● Practice session was held in Bandung about Step Test. ● PDAM has only one leakage detector. Budget is very scarce for equipment purchase. ● The knowledge learnt in the training has been shared with other staff. NRW team is formed in the PDAM since 2014. ● It is necessary to implement and monitor pilot projects after trainings.
Provincial TOT	Kabupaten Badung	Head of Distribution & Maintenance Section	Master's	<ul style="list-style-type: none"> ● Both training materials and instructors are good but the training duration is too short. ● It is good to take psychological test in the trainings. ● It was good experience to prepare proposals and present them. ● They took practice training in PDAM Kota Malang, which provided the necessary equipment and tools. ● They are not satisfied with accommodation facility in BTAMS II. ● He made proposal for DMA establishment in Dalung. The instructor from Akatirta supported his preparation which was monitored by the COE Management Consultant. ● The knowledge learnt in the trainings is shared in his division in the PDAM.

BINTEK	Kabupaten Badung	Distribution - Administration Staff	Bachelor's	<ul style="list-style-type: none"> ● The training materials are easy to comprehend. ● Training duration is too short. He needs more practice sessions. ● The equipment and tools for the trainings are not sufficient.
BINTEK	Kabupaten Badung	Distribution Staff	Bachelor's	<ul style="list-style-type: none"> ● It was good to exchange experience with participants from other PDAM. ● Wants to know leakage detection technique in noisy environment such as in Kuta, Bali.
BINTEK	Kabupaten Gianyar	Technical Section Head of branch office	High School	<ul style="list-style-type: none"> ● Learned a lot of new knowledge. ● Training materials and instructors are good. ● There was only one set of tools in the training so the class had to share it.
BINTEK	Kabupaten Gianyar	Technical Section Head of branch office	High School	<ul style="list-style-type: none"> ● Learned a lot of new knowledge. ● Training materials and instructors are good. ● Water pressure is controlled by the PDAM headquarters and water balance control and pipe repair are done by its branch offices.
Provincial TOT	Kota Palembang	NRW Manager in Ulu Dua Unit	Bachelor's	<ul style="list-style-type: none"> ● Training materials are good. There has been no NRW training like this one. ● Training duration is too short; especially the practice training. ● It was good to exchange views with other participants from 12 different PDAMs. ● After learning about DMA establishment, they proposed a pilot project of DMA. It was also recognized that DMA establishment takes much cost.
Provincial TOT	Kota Palembang	Assistant Manager for Distribution	Bachelor's	<ul style="list-style-type: none"> ● Same opinion as Mr. Rizky's. ● Training duration is too short. Preferable ratio of lecture and practice is 50:50. ● It was good to share their views with other training participants. ● The knowledge they learned in the trainings are utilized in practice in their daily operation. ● Hope that COE Program will expand throughout the country. ● Proposed and implemented the DMA establishment project after trainings.
BINTEK	Kota Palembang	Executive Staff for Distribution	Bachelor's	<ul style="list-style-type: none"> ● Understood about NRW control very well through the trainings. ● Training duration is too short.
BINTEK	Kota Palembang	Staff for Billing & Arrears	Bachelor's	<ul style="list-style-type: none"> ● Learned about knowledge on NRW control. ● It was good to know about situation in other PDAMs and have exchange with other PDAM staff. ● Expects COE Program will continue. ● Training duration is too short. ● Did not receive any certificate or evaluation results after trainings.
BINTEK	Kabupaten Banyuasin	Head of Transmission Section	High School	<ul style="list-style-type: none"> ● Instructors and training duration were both sufficient. ● New knowledge was learned but there is no equipment to practice.
BINTEK	Kabupaten Banyuasin	Head of Sumbawa Branch	Vocational School	<ul style="list-style-type: none"> ● Instructors and materials are sufficient. ● Learned about advanced equipment. ● Class room was too small.

Provincial TOT	Kabupaten Ogan Ilir	Head of Subdivision for Distribution	-	<ul style="list-style-type: none"> ● Instructors and materials are good; but he wants to know more about causes of leakage. ● Duration is too short. ● The practice session was held in PDAM Kota Palembang. ● The knowledge and technique learned in the trainings cannot be practiced on the field due to lack of relevant tools and equipment. ● He prepared a project proposal after training but the instructor evaluated that it was less feasible and was not submitted to the PDAM management.
BINTEK	Kabupaten Ogan Ilir	Head of subdivision for Customer	Vocational School	<ul style="list-style-type: none"> ● Understood the training materials very well. ● Training duration is too short. ● The equipment and tools used in the trainings were sufficient. They were borrowed from PDAM Kota Palembang. ● Participants did not received certificates after trainings.

(Source: JICA Study Team based on PDAM Interviews)

Energy Efficiency

- Some participants actually made proposals based on learned knowledge to their PDAM management for energy efficiency projects.
- BINTEK participants pointed out the shortage of tools and equipment used in the trainings.

Table 8 Comments of COE Training Participants (Energy Efficiency)

Course	PDAM	Title	Education	Major Comments
Provincial TOT	Kota Malang	Assistant Manager of Pumping	Bachelor's	<ul style="list-style-type: none"> ● The training contents are all basic and essential. ● Learned about energy audit and pumps. But it was rather a one-way lecture. ● He proposed to his PDAM purchase of the equipment used in the trainings.
Provincial TOT	Kabupaten Maros	Head of Technical Division	Bachelor's	<ul style="list-style-type: none"> ● The PDAM uses a lot of pumps and has an issue on the energy efficiency. ● It was good to learn many topics but it was a little too much. ● This PDAM does not own equipment and tools introduced in the trainings so that it cannot hold an internal training. ● Purchase of equipment was considered after trainings but not realized due to the PDAM's budget constraints. ● Trainings should be learnt not only by an individual but by a team from same PDAM consisting of pump specialist, electrician, NRW specialist, etc.
Provincial TOT	Kabupaten Maros	Equipment & Tool Staff	-	<ul style="list-style-type: none"> ● Training duration is too short compared to the contents. ● There are less practice sessions than trainings. ● The facility in BTAMS II is sufficient. ● The training contents are all essential, but not only that can solve the problems of the PDAM. ● He could repair the electricity board in his PDAM based on the knowledge learnt in the trainings. ● The PDAM does not own the tools and equipment used in the trainings.

BINTEK	Kabupaten Takalar	Head of Technical Division	-	<ul style="list-style-type: none"> ● Learned the knowledge on pump selection, energy saving, etc. ● Expects more practice trainings rather than lectures. ● The trainer was a PDAM staff so it was good to share on-hands knowledge. ● Proposed equipment purchase to the PDAM.
BINTEK	Pangkajene dan Kepulauan	Technical Staff Operator	High School	<ul style="list-style-type: none"> ● The training contents should be adjusted considering conditions and facility level of the participating PDAMs ● The training session using Excel was not familiar and was difficult. ● The PDAM does not own the equipment used in the trainings. ● The electricity cost was saved by adjusting pump operation time based on the knowledge learned in the trainings. ● He proposed installment of elevated water tank but did not know how to propose the funding from authority.
BINTEK	Kota Denpasar	Sub-Division Head of Machine & Installation Maintenance Division	Bachelor's	<ul style="list-style-type: none"> ● Training duration is too short. ● Training contents should have more case studies and good practice cases of other PDAMs. ● PDAM Kota Denpasar has only general measurement tools but does not own those introduced in the trainings.
BINTEK	Kabupaten Badung	Distribution Staff – Mechanical Electrical	Vocational School	<ul style="list-style-type: none"> ● The training duration is too short; the lecture is too speedy. ● He did not engage in PDAM improvement activities after training. ● The PDAM does not own equipment of energy efficiency introduced in the trainings.
Provincial TOT	Kabupaten Tabanan	Head of Distribution division	-	<ul style="list-style-type: none"> ● Duration is too short. ● He did not know the TOT training was to create trainers. ● Both instructors and materials are good. ● Was not satisfied with the accommodation facility in BTAMS II. ● The knowledge from the trainings were shared with other staff and management officials in the PDAM.
BINTEK	Kabupaten Gianyar	Head of Tegalalang branch office	Bachelor's	<ul style="list-style-type: none"> ● Duration is too short. ● Ten people had to share one tool during the training. ● The evaluation test results were not disclosed to the participants. Only the participant with the highest score was announced.
BINTEK	Kabupaten Gianyar	Head for Production Division	Vocational School	<ul style="list-style-type: none"> ● The knowledge learnt in the trainings can be applied in the actual operation in the PDAM. For example pump replacement is done considering capacity suitable to the demand.
Provincial TOT	Kota Palembang	Executive Staff for Monitoring Section, Planning division	Bachelor's	<ul style="list-style-type: none"> ● It was new experience participating in COE. New knowledge was obtained and it was good to learn presentation skills. ● The training materials are good but the lecture is a little boring. ● The training duration is too short and there is not much time for discussions. ● The practice training is very good. The equipment used there is good. ● He proposed to have energy audit in his PDAM.

BINTEK	Kota Palembang	Assistant Manager for WTP	Bachelor's	<ul style="list-style-type: none"> ● It was good to know about other PDAMs. There are issues on management and funding in many cases. ● There are some topics that trainers do not know very well such as cost saving. ● Most participants are high-school graduates; so that the training contents might be difficult. ● Training sequence should be like theory-practice-theory-practice. ● Manager-level staff should participate in the trainings.
BINTEK	Kabupaten Banyuasin	Head of Production Section	Vocational School	<ul style="list-style-type: none"> ● The instructors from AKATIRTA are good but the trainers (PDAM staff) are not well experienced in teaching. ● Knowledge about pump can be utilized in daily operation in PDAM. ● Was not familiar with computers used in the trainings.

(Source: JICA Study Team based on PDAM Interviews)

SAK ETAP

- Since the introduction of SAK ETAP as the new financial accounting system is still in transition, it is indicated that the continuation of the module in COE Program is necessary.
- Among more advanced participants, there is need for trainings in financial analysis and management that directly contribute to improvement of business planning and management skills.

Table 9 Comments of COE Training Participants (SAK ETAP)

Course	PDAM	Title	Education	Major Comments
Provincial TOT	Kota Malang	Assistant Manager of Account	Bachelor's	<ul style="list-style-type: none"> ● Since it is new accounting system introduced in 2011, there should be SAK ETAP guidelines for PDAMs ● The level of participants must be the same. ● SAK ETAP is effective as financial reporting. The financial management module is necessary to activate it in the PDAM management.
Provincial TOT	Kabupaten Maros	Subdivision chief of accounting	-	<ul style="list-style-type: none"> ● The training materials are sufficient and effective, but more case studies are requested. ● Training duration was too short and insufficient for questions and answers. ● Needs financial reporting support after trainings. ● Accommodation facility in BTAMS II is not satisfactory.
BINTEK	Kabupaten Takalar	Subdivision Head for Accounting	-	<ul style="list-style-type: none"> ● Training contents are rather basic. ● It is good to have exchange of views and experience among participants. ● Needs more case studies.
BINTEK	Kabupaten Pangkajene dan Kepulauan	Head of Financial Division	-	<ul style="list-style-type: none"> ● Instructors and materials are good. ● Training duration is too short. ● Needs case studies on actual financial reporting
Provincial TOT	Kota Denpasar	Executive Head for Accounting	Bachelor's	<ul style="list-style-type: none"> ● SAK ETAP was not a new topic since PDAM Kota Denpasar had already adopt it from 2010. But new knowledge was obtained through the trainings. ● COE has good points such as exchange among PDAM staff on their experience and views. It was good to make comparison with PDAM Kota Malang.

Provincial TOT	Kabupaten Tabanan	Subdivision Head for Accounting division	-	<ul style="list-style-type: none"> ● Training materials and instructors are both good. ● More case studies are requested. ● “Financial Analysis” module is necessary. ● Accommodation facility in BTAMS II is not satisfactory.
BINTEK	Kabupaten Gianyar	Head of Accounting Section	-	<ul style="list-style-type: none"> ● Training materials and instructors are both good. ● Training duration is too short. ● More case studies are requested. ● The computer lab room in PIP2B is too small.
BINTEK	Kabupaten Gianyar	Head of Administration Finance Section	-	<ul style="list-style-type: none"> ● Accounting knowledge was obtained though he is not engaged in SAK ETAP on a daily basis. ● Trainers are not familiar with case studies. It is better to have professional instructors also.
Provincial TOT	Kota Palembang	Manager of Kali Doni Unit	-	<ul style="list-style-type: none"> ● The instructor was not familiar with PDAM-specific accounting. ● Participants’ background should be about the same. ● The participants from three PDAMs did not bring their laptop out of total seven PDAMs.
BINTEK	Kabupaten Banyuasin	Head of finance Section	High School	<ul style="list-style-type: none"> ● Training duration is too short. ● He did not understand the contents very well and feel that more basic knowledge was necessary. ● Practice sessions are also too short. ● Classrooms are small.
BINTEK	Kabupaten Banyuasin	Staff for Finance	High School	<ul style="list-style-type: none"> ● Instructor and materials are good. ● Needs more basic knowledge and trainings. ● Practice sessions are too short.
BINTEK	Kabupaten Ogan Ilir	Head of Subdivision for Finance	High School	<ul style="list-style-type: none"> ● This training is very useful. ● Classrooms are too small. ● Laptop computers were brought by the participants. ● Training duration is short and the contents are difficult. His PDAM is still under transition of adaptation of SAK ETAP. ● More case studies are requested.

(Source: JICA Study Team based on PDAM Interviews)

6. Challenges of COE Program

6.1 Necessity of COE Program

As explained by Cipta Karya, there is urgent need to accelerate the dissemination of operational knowledge and skills among PDAM staff by COE Program in order for the central government to implement the supporting measures for the improvement of financial and operational status of PDAMs throughout Indonesia. Unlike the existing training programs, the COE Program is characterized by its vast outreach to small scale PDAMs in provincial level. Many PDAMs expressed their interest and expectations in further expansion of the program.

6.2 Challenges of COE Program

(1) Functions of PIP2B

Currently, PIP2B in each province is in the transition to be a provincial information and training center for the human settlement sector including water supply. Provincial COE trainings have been physically held in PIP2B; however, its organizational capacity is still very limited and the management of provincial-level trainings will have to rely on the COE management consultants with support from Satker PK PAM.

(2) Establishment of COE Central Management System

Cipta Karya has a long-term goal that the COE Program will be implemented on provincial level and the central government role will be limited to funding and general management. On the provincial level, though its current organization capacity is quite limited, PIP2B and DPD PERPAMSI will be the primary organizations to implement the trainings according to Cipta Karya officials. The proposed JICA project is required to support Cipta Karya to elaborate and establish the workable COE Central Management System.

(3) Role of COE Management Consultants

Currently most part of the COE Program implementation is managed by the COE management consultants hired by Cipta Karya. Their report suggests to enhance PIP2B's functions and to follow up on the trainers' activities after TOT. However, those suggestions lack specific action plans and the COE Program needs more concrete monitoring mechanism that is utilized to improve the program management.

(4) PDAM Improvement Activities after Trainings

Qualified TOT participants who have managed to make project proposals and implement the NRW or Energy Efficiency projects are often Healthy PDAMs which have already been engaged in the same activities; whereas many BINTEK participants especially from small PDAMs face difficulties when they try to implement what they have learned in their home PDAMs due to lack of resources.

Many interviewee PDAMs say that they need to learn how to formulate project and make proposal for central government or other funding sources. There is eminent need for financial management trainings including business plan formulation.

(5) Additional Training Modules

- Among the existing three modules, SAK ETAP is focused on familiarizing the financial accounting and reporting based on the current regulations. For more advanced participants,

there is need for new module for **Financial Analysis and Management**.

- **Customer Management** is also the most needed module among PDAMs and Cipta Karya, which will be developed in the proposed JICA project.

(6) Improvement of Training Modules

- **NRW:** The existing NRW module materials have focus on DMA establishment and leakage detection. In order to take more comprehensive NRW reduction measures, additional contents are required such as water pressure control, commercial loss, and pipe installation including those measures that small-scale PDAMs can implement with less resources.
- **Energy Efficiency:** Not only the efficiency of individual process such as pumps and M&E, it should put more emphasis on the energy efficiency in the whole water supply system including water supply planning, etc.
- Both NRW and Energy Efficiency modules requires emphasis on the measures applicable to small scale PDAMs.
- Proposed new modules i.e. **Financial Analysis and Management** and **Customer Management** need training material development.

Table 10 Proposed Additional Contents in the Existing Training Modules

	Module	Added Item	Added Contents
Existing	NRW Reduction [Existing Items] • Introduction of NRW • Control of Water Loss • Leakage Detection	NRW Reduction Planning	<ul style="list-style-type: none"> • Budgeting • Staffing and Incentives • Pipe Replacement Planning • Cost-Benefit Analysis
		Commercial Loss Reduction	<ul style="list-style-type: none"> • Meter Placement • Metering and Billing • Customer Database
		Water Pressure Control	<ul style="list-style-type: none"> • Appropriate Water Pressure • Water Pressure Measurement • Water Supply Control
		Pipe and Meter Selection	<ul style="list-style-type: none"> • Pipe Selection • Meter Selection
		Piping and Repair Technique	<ul style="list-style-type: none"> • Pipe installation • Customer pipe installation
		New Technology for Leakage Detection	<ul style="list-style-type: none"> • Japanese technology for water leakage detection
Existing	Energy Efficiency [Existing Items] • Introduction to Energy Efficiency • Planning and Operation of Pump System • Electricity	Water Transmission and Supply Planning	<ul style="list-style-type: none"> • Design of transmission and supply pipes • Diagnosis of existing system by EPANET • Planning of transmission and supply system improvement
		Pumping Station	<ul style="list-style-type: none"> • Case study on electricity cost and capital investment

Existing	SAK ETAP [Existing Items] • Introduction of SAK ETAP • SAK ETAP Financial Statements • Elaboration of Financial Statements	[No added items]	---
New	Financial Analysis and Management	Business Plan Preparation	<ul style="list-style-type: none"> • Short-term action plan • Long-term business plan
		PDAM Operational and Management Monitoring	<ul style="list-style-type: none"> • Financial Sustainability • Financial Analysis • Accounting Receivable Collection • Debt Restructuring • Analysis of Financial Statements
		Water Tariff Setting	<ul style="list-style-type: none"> • Water Tariff calculation
New	Customer Management	Customer Database	<ul style="list-style-type: none"> • Usage of GIS
		Tariff Collection	<ul style="list-style-type: none"> • Debtor relations • Tariff payment methods • Capacity building of Meter readers • Incentive mechanisms for good customers, etc.
		Complaint Response	<ul style="list-style-type: none"> • Call center/ Customer center • Complaint response flow
		Public Relations and Awareness Building	<ul style="list-style-type: none"> • Theft prevention campaign • Water saving campaign • Community awareness events

(Source: JICA Study Team)

(7) Classification of BINTEK Participants

Current BINTEK level training participants range from field level operators and division head officials. Moreover, operational and institutional conditions are very different among small-scale PDAMs and large PDAMs. Reflecting such diversity, It is proposed to classify the NRW, Energy Efficiency and Financial Management modules into two levels: Basic Course and Advance (Applied) Course.

Table 11 Proposed Training Module Classification

Module	Course Classification	
NRW Reduction	[Basic Course] Definition of NRW, Estimation of NRW, Meter reading , meter replacement, customer pipe installation, NRW management team building, budgeting, etc.	[Advanced Course] Underground leakage detection, DMA, Pressure control, Pipe replacement, NRW reduction planning, etc.
Energy Efficiency	[Basic Course] Energy consumption and cost Energy efficiency control	[Advanced Course] Energy efficiency planning through case studies including network analysis and case studies
Financial Analysis and Management	[Basic Course] Understanding of Business Plan PDAM Performance Monitoring Indicators Water Tariff Setting	[Advanced Course] Business Plan Elaboration through Case Studies
Customer Management	[No classification is planned]	

(Source: JICA Study Team)

(8) Incentive Mechanism of National and Provincial Trainers

The COE Program keeps expanding to reach 31 provinces in 2014. This means that the number of National and Provincial Trainers is expected to increase as well. However, there is no incentive mechanism for qualified Trainers. It is preferable that Cita Karya will establish such incentive mechanism to promote recruitment of Trainers and Trainer candidates.

(9) Shortage of Tools and Equipment for Trainings

There is shortage of equipment and tools necessary for BINTEK trainings for NRW and Energy Efficiency modules. Directorate of Water Supply is planning to purchase necessary equipment for each PIP2B in 2014 which requires further monitoring of the implementation.

6.3 Request by Cipta Karya for JICA Project

The request by Cipta Karya for the future JICA project is as follows:

- Improvement of training modules
- New training modules (customer management, financial analysis and planning, business planning)
- Pilot project implementation in Performance-Based Contract (PBC)
- Future implementation system of COE Program