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PDAM ASSESSMENT REPORT

NOVEMBER 30, 2005

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Photo Credit: ESP Medan/ North Sumatra.

IPA Sunggal (Water treatment plant in Sunggal) is operated by PDAM Tirtanadi in Medan, North Sumatra with the capacity of treating 1,500 liters of water per second. This plant produces clean water to around 600,000 people daily.

PDAM ASSESSMENT REPORT

Title: PDAM Assessment Report

Program, activity, or project number:
Environmental Services Program, DAI Project Number: 5300201

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1. INTRODUCTION

One of the program components of the Environment Service program (ESP) is to improve the public health through increasing the public access to clean water. This, among others, is being done through enhancing the performance of the PDAM (*Perusahaan Daerah Air Minum* -- Indonesia Water Supply Company).

To achieve maximum, efficient and effective results, the selection of PDAMs that are to be included in the ESP program is conducted by considering their relationship with other components of ESP, especially with the watershed management and biodiversity issue at the upstream area and the municipal financial component of the project.

The improvement of all PDAMs performance will not be perceived in the first year of the ESP program, but their performance capabilities will improve gradually in the coming years of the program. For this purpose, a selection scheme of PDAMs that will be included in a ESP yearly-bases program, will be conducted.

In addition to the selection of the PDAMs, there is a need to determine the priority programs for each selected PDAM according to the need to improve the performance of the respective PDAM.

Assessment is required to determine which PDAM shall be selected in the first year program and on what priority programs for each PDAMs to improve their capacity and performance.

2. PURPOSE

The purpose of the PDAM (Indonesia Water Supply Company) assessment is:

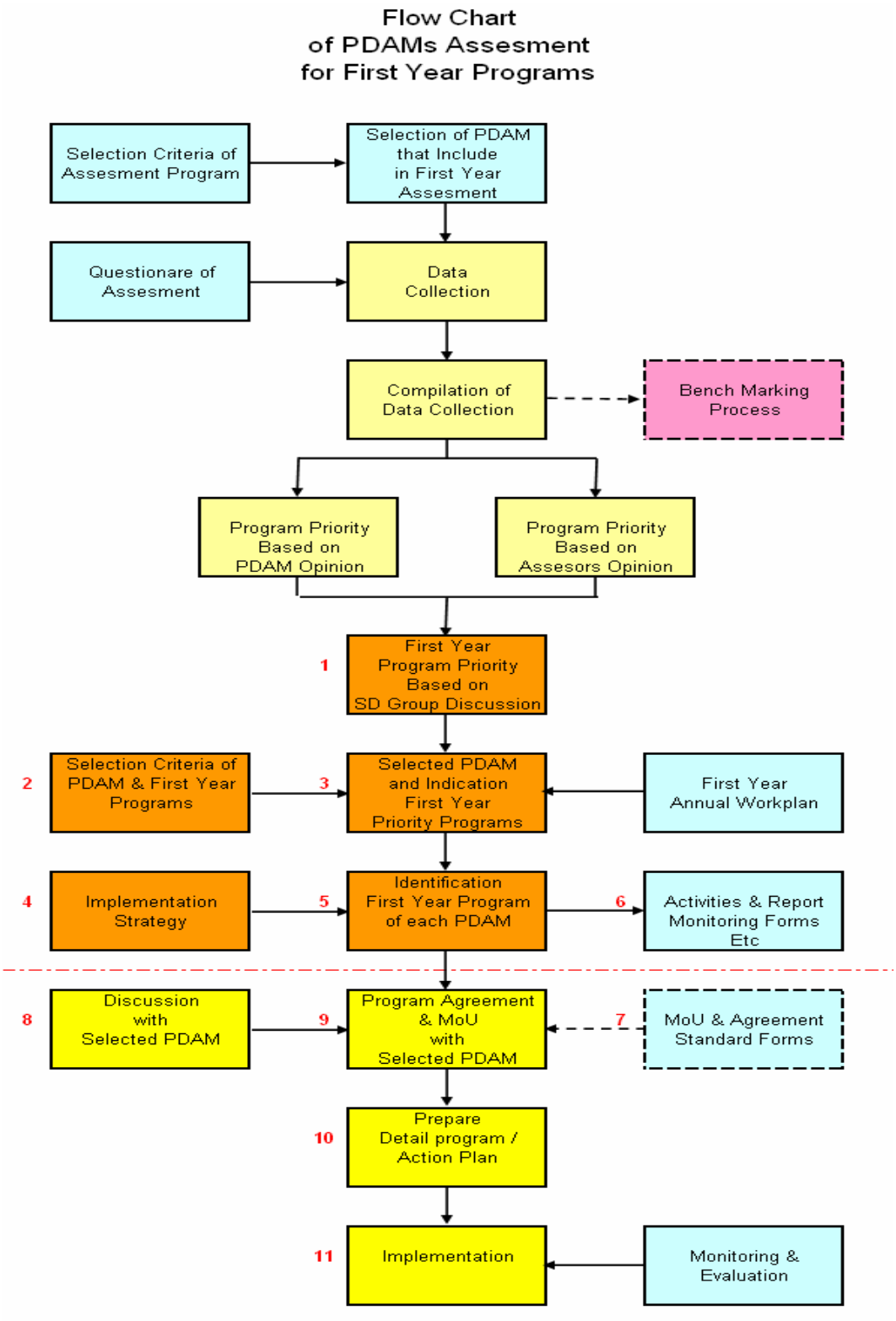
- To collect data of the performance of the PDAM in the ESP program area;
- To conclude priority programs the respective PDAM perceived as the very important programs that are needed for the PDAM to increase their performances; and
- To understand the political will of the respective PDAM/Regional Government for improved management performance;
- To provide accurate PDAM information to be used as baseline for measuring performance improvement.

The results of the assessment will be used as considerations in:

- Determining the PDAMs that are to be participating in the first year of ESP PDAM capacity building program;
- Determining the first year priority program for each selected PDAM;
- Obtaining data for benchmarking analysis of the selected PDAM;
- Setting up Memorandum of Understanding (MoU) between the PDAM and ESP to embark with a PDAM capacity building program;
- PDAM Baseline Performance data.

3. APPROACH

The approach used in conducting the PDAMs assessment is shown in the Flow Chart below:



• THE SELECTION OF PDAM TO BE ASSESSED

The PDAMs selected to be assessed in the first year program are PDAMs that exist in 4 high priority provinces (North Sumatra, West Sumatra, West Java and East Java) and are PDAMs located within the selected watershed areas selected by the ESP watershed management team, as shown in Table 3.1 below.

Table 3-1 PDAMs inside Selected Watershed Area

Description	PROVINCE			
	North Sumatra	West Sumatra	West Java	East Java
Watershed Area	• Wampu • Deli	• Batang Arau • Batang Hari • Batang Kuantan	• Burangrang-Tangkuban Perahu • Gede-Pangrango	• Brantas
PDAM	• Medan (M) • Karo (D) • Deli-Serdang (M) • Langkat (D) • Binjai (M)	• Padang (M) • Solok (D) • Solok (M) • TanahDatar (D) • BukitTinggi (M)	• Bandung (M) • Bandung (D) • Bogor (M) • Bogor (D) • Sukabumi (M) • Sukabumi (D) • Purwakarta (D) • Cianjur (D) • Subang (D)	• Surabaya (M) • Malang (M) • Malang (D) • Batu (M) • Gresik (M)

Note: (M): Municipality
(D): District

Although the PDAM Bukit Tinggi is not located within the selected watershed areas, it was selected on the merit of political decision because the Regional West Sumatera ESP Office was relocated to Bukittinggi due to earthquakes and the fear of a tsunami experience. On top of those PDAMs, ESP conducted assessment at PDAM Balikpapan as one of special imperative area.

• DATA COLLECTION

Data collection for the assessment is conducted by Service Delivery team from each ESP regional office, through:

- » Collecting secondary data or requesting the PDAM to fill-in quantitative data form;
- » Conducting interviews to acquire qualitative data. These interviews are not done on a one-on-one basis but collectively from Top/Middle level of the PDAM management staff. The advantage of this method is to minimize subjective individual opinions as well as to receive opinions from more people involved in the PDAM;
- » Requesting the PDAM to fill-in priority programs based on the PDAM employees opinions and this is conducted through a participatory approach among top and middle level management of PDAM staff.

Based on the data received, the Service Delivery Team at each regional office will draft a report that will include two major findings:

- » The PDAMs that are considered to be included/not included in the first year program;
- » The priority program suggested from each PDAM.

- **PDAM SELECTION AND DETERMINATION OF PRIORITY PROGRAMS**

Selection of PDAMs and their priority programs is based on the criteria shown in Appendix I. The selection is conducted by the Service Delivery Team. Included in the Team is a representative from the Municipal Finance Team to ensure activities are in line with the Municipal Finance workplan and targets. The Team evaluates and approves the assessment results of each regional office. Final recommendations on priority programs to be conducted will be made mutually with the respective PDAM.

- **PDAM AGREEMENT**

The final result of the assessment will be presented to the respective PDAM and when necessary further discussion will be made prior to establishing an agreement for implementation.

4. IMPLEMENTATION OF ASSESSMENT

The assessment started in April, 2005 with the preparation of questionnaires. The first two weeks of May, the assessment team started to collect qualitative and quantitative data of the target PDAMs and in the third week of May, the team in Jakarta have identified the PDAMs and their related priority programs for training. Due to the PDAMs condition, 2 PDAMs (PDAM Padang and PDAM Balikpapan) was assessed after May 2005.

The assessment report including the qualitative and quantitative data collected of each PDAM in respective Province is in Appendix II.

5. ASSESSMENT RESULT

Based on this assessment result, 2 (two) PDAMs were automatically not selected because they are not interested in the program. These are the PDAMs who are not cooperative during the assessment by not providing the data i.e.: PDAM Binjai, and PDAM Surabaya.

However, PDAM Padang was assessed later in the assessment cycle and was evaluated separately because it is too late to evaluate its result together with other PDAMs assessment.

From the assessment results, two PDAMs in West Java Province, i.e. PDAM Bandung District and Bogor District, were not selected because they do not reach the scoring level as the remaining 7 (seven) other PDAMsin West Java. An exception was made to the PDAM of Sukabumi City and that of Sukabumi District and were included in the selection to conduct limited programs.

The selected PDAMs can be seen in Table 5.1 below.

Table 5-1 List of PDAM Selected

Description	PROVINCE			
	North Sumatra	**West Sumatra**	**West Java**	**East Java**
Selected	• Medan (M) and Deli Serdang (D) • Karo (D) • Langkat (D)	• Solok (D) • Solok (M) • Tanah Datar (D) • Bukit Tinggi (M) • Padang (M)	• Bandung (M) • Bogor (M) • Sukabumi (M) • Sukabumi (D) • Purwakarta (D) • Cianjur (D) • Subang (D)	• Malang (M) • Malang (D) • Batu (M)
Not selected	• Binjai (M)		• Bandung (D) • Bogor (D)	• Surabaya (M) • Gresik (M)

Note: (M): Municipality
(D): District

PDAM of Kota Medan, Bogor and Malang were also the priority areas of the ESP Municipal Finance Team.

The priority program for each selected PDAMs is shown in Table 4.2 .
The activities in the table are in priority order and are based on the assessment result at the respective region, while the box in yellow represents the agreed program to be implemented with the respective PDAM.

There are some differences of priority program between what is being drafted by the regional teams and those agreed by the Service Delivery teams. The reasons are:

- Other considerations which were overlooked resulting in changes in the sequence of priorities to be conducted.
- Programs that were initially not prioritized by PDAM, because they are assumed as making the PDAM performance even worse but in the other hand the programs are necessary according to the goal of ESP, for example the Benchmarking and that of increasing access for the urban poor.

During implementation, this priority program may change, either due to less accurate data acquired during the assessment process or because the PDAM are not ready to participate in the cost sharing scheme as initially agreed upon.

6. LESSONS LEARNED AND SUGGESTION

From the implementation of assessment, there were some lessons learned during the assessment:

1. A number of PDAMs are initially reluctant to share the data in hard copies. This was not because they were not interested to participate in the ESP program, but more due to lack of information from ESP to either the local government or PDAM that an assessment will made so that the required data will be made available.
2. There are PDAMs that did not want to give the datas before a MoU is sign.
3. The completeness/accuracy of data sometimes were known after the data were collected and is difficult to come back to request for more data or explanation.
4. A number of PDAMs have difficulties in completing the questionnaire forms because lack of technical capability.
5. There are PDAMs that do not have written data in accordance with the need of the questionnaire, or there are different figures for the same data from separate working units. For instance, the data from finance division is different with those from the technical division. There is some difficulties to decide which data is the correct data.
6. There is a tendency to change the data overtime.
7. PDAMs bureaucracy is high that ESP assessor can not conduct the assessment before meeting with the PDAM director.

Several things that need to be done to improve future PDAMs assessment would be:

- The quantitative questionaire form has to be simplified, and additional questions need to be added for example questions related to the financial data, such as cash balance, etc. ;
- Report guidelines or format for the PDAM assessment's result should be available for use by the assessors;
- PDAM assessment should be made after the ESP program is socialized to the target agencies;
- Need reasonable time allocation for the assessment.

Table 4.2.
Priority of First Year PDAM activities Programs

KEGIATAN	North Sumatra			West Sumatra					West Java							East Java			SIA
	Kota Medan	Kab. Karo	Kab. Langkat	Kota Solok	Kab. Solok	Kota B. Tingg	Kab T. Datar	Kota Padang	Kab. Subang	Kab. Purwakart	Kota Bandung	Kota Bogor	Kab. Cianjur	Kab S.bumi	Kota S.bumi	Kab. Malang	Kota Malang	Kota Batu	Kota B. Papam
B PROGRAM PRIORITY																			
1 Corporate Plan	2	2	4	14	1	1	15	1	4	3	1	2	3	3	6	2	6	7	13
2 customer orientation	3	4	8	13	9	8	5	6	7	4	4	3	5	6	7	3	5	2	9
3 training & CB	10	5	5	2	3	3	6	3	8	5	8	13	9	5	8	5	4	4	5
4 inter-regional issues	8	12	13	7	12	7	12	7	5	13	7	4	8	7	3	7	3	5	14
5 Bench Marking	7	9	12	10	15	12	13	12	15	14	12	13	15	13	11	15	8	14	8
6 water quality	11	15	15	8	11	11	7	11	9	6	13	12	14	14	12	11	7	13	4
7 GIS & MIS	13	10	14	9	14	13	1	5	3	7	5	8	13	8	9	10	2	11	12
8 Non Revenue Water	14	1	1	3	4	4	11	2	10	12	3	11	7	1	1	1	1	6	2
9 tariff review	1	11	10	1	2	2	2	4	2	1	9	10	6	9	5	8	14	3	11
10 IKK	5	6	3	0	5	-	8	-	14	15	-	-	2	4	-	6	-	-	-
11 meter reading and billing	15	3	2	6	7	10	10	13	6	2	6	5	4	2	4	4	11	10	7
12 energy and pressure	9	8	9	4	6	5	4	8	11	8	10	6	10	10	13	9	10	8	1
13 production and distribution c	6	13	6	11	10	9	9	9	12	9	11	7	11	11	14	13	12	9	3
14 access for urban poor	12	14	11	12	13	14	14	14	13	11	14	9	12	12	10	12	13	13	10
15 increase capacity	4	7	7	5	8	6	3	10	1	10	2	1	1	15	2	14	9	1	6

First year program

APPENDIX - 1

SELECTION CRITERIA

Criteria for PDAM Selection

The criteria used in the PDAM selection for the first year program are as follow:

- PDAM District/Municipality that exists in the High Priority Provinces area;
- PDAM is located at the downstream from selected watershed area;
- PDAM has the political will and agree to contribute/cost-sharing in program implementation;
- Selected PDAM is one of the targeted PDAMs for first year program implementation;
- Selected PDAMs are distributed within overall priority program;
- PDAM that consider the priority programs are more important programs to other programs;
- Special considerations.

Criteria for Priority Program

The criteria to be used in determining the priority program are:

- Programs that are expected to provide the highest result to improve PDAM performance in accordance with the ESP objectives;
- Programs that are realistic and could be implemented by the PDAM in line with the existing conditions;
- Programs that can be implemented within 2 years;
- Programs that are evenly distributed in all High Priority Provinces;
- Programs that are agreed upon between PDAM and ESP.

APPENDIX II-A

PDAM ASSESSMENT–EAST JAVA PROVINCE

The total PDAMs covered in the Brantas Watershed area were 5 PDAMs and they are: Surabaya municipality, Malang District, Malang municipality, Batu Municipality and Gresik District. PDAM Gresik was not planned for participation in the first year ESP program, while PDAM Surabaya was not assessed because they are not interested to participate in the ESP program.

The areas of Malang Municipality, Malang District, and Batu Municipality are regarded as those that form the Malang Raya zone. Grouping of these three areas is basically based on geographical borders that those are neighboring to each other. Basically, there is no legal ground on the formation of this Malang Raya Zone, it is form on the basis of actual and common interests that emerge in the three regions.

The provincial agency that overlooks the area, Bakorwil 3, acknowledges this grouping although actually this zone covers more than the three areas mentioned above. ESP prioritizes this program area because the three areas have similar concerns in the issue of water use and/or water sale.

General data from 3 PDAMs are in table 2A-01 through Table 2A-04. Table 2A-05 shows the qualitative data of the three areas of Malang District, Malang Municipality, and Batu Municipality.

Table 2A-01. Water Source, Production, Distribution, Sold Water and Water Loss, East Java Province - Year 2004

No	Description	PDAM		
		Malang District	Malang Municipality	Batu Municipality
1	Number of Service Area			
	* Main Area	1	1	1
	* Sub Area (IKK)	23	0	0
2	No of Water Prod. Sources			
	* spring	37	8	7
	* river	3	0	0
	* deep well	4	7	0
	* others	0	0	0
	Total	44	15	7
3	Water Production Capacity (l/s)			
	* spring	1040	1490	98
	* river	0	0	0
	* deep well	35	84	0
	* other	0	0	0
	Total	1075	1574	98
4	Average Production (l/s)	972	1,292	86
5	Ave. Distribution (l/s)	571	1,227	86
6	Ave. Water Sold (l/s)	380	791	56
7	Water Loss (%)	61	39	35

Table 2A - 02. Population, Served, No of Connection and no of PDAM Employee, East Java Province - Year 2004

No	Description	PDAM		
		Malang District	Malang Municipality	Batu Municipality
1	Population			
	* Total	2,360,908	857,922	166.948
	* Served Area	495,893	857,922	166.948
	* Served	239.672	406.315	34.000
2	%tage served, from			
	* total population	10	47	20
	* served area	48	47	20
3	No of connection	59.243	81.263	8.509
4	Hour/day served	24	24	24
5	No of employee	506	540	97

Table 2A - 03. Base Tariff, Average Tariff and Connection fee, East Java Province - Year 2004

No	Description	PDAM		
		Malang District	Malang Municipality	Batu Municipality
1	Base Tariff (Rp/m3)	880	900	550
2	Average Tariff (Rp/m3)			
	* Year 2004	1,669	1,918	961
	* Year 2003	1,919	1,668	836
3	Connection fee (Rp)	380,000	1,000,000	380.000

Table 2A - 04. Financial Data's (Rp. Mill), East Java Province – Year 2004

No	Description	PDAM Unit	Malang District	Malang Municipality	Batu Municipality
1	Annual operation expenses (not include depreciation & interest)	Rp.mill/ Year	13,246.7	34,187.5	4,538.9
2	Annual Operating revenue	Rp.mill/ Year	15,854.9	51,165.5	5,050.3
3	Annual operating cost (include depreciation & interest)	Rp.mill/ Year	15,724.1	39,698.2	6,587.4
4	Current assets	Rp mill	3,318.7	12,763.6	1,549.5
5	Current liabilities	Rp mill	3,919.2	11,338.7	10,333.2
6	Annual debt service	Rp.mill/ year	500.0	26,758.1	0
7	Net operating income (before interest & tax)	Rp mill	1,576.2	11,881.7	(617.2)
8	Historical value of tangible assets	Rp mill	10,019.2	30,208.5	11,456.3
9	Depreciated historical value of tangible assets	Rp mill	29,128.3	51,970.6	10,263.0
10	Operating income (before depreciation)	Rp.mill/ year	1,711.1	13,006.4	(411.0)
11	Annual labor cost	Rp.mill/ year	6,247.5	16,789.8	1,41.2
12	Annual energy cost	Rp.mill/ year	7,195.0	6,994.6	1,600.7
13	Revenue from annual water sales	Rp.mill/ year	15,215.0	47,966.9	4,540.0
14	Year end accounts receivable	Rp mill	2,789.9	7,157.8	1,770.5
15	Revenue from annual domestic water sales	Rp.mill/ year	14,722.3	33,114.8	3,397.0
16	Revenue from annual social water sales	Rp.mill/ year	530.3	1,300.8	450.8
17	Revenue from annual commercial & industrial water sales	Rp.mill/ year	1,001.5	5,948.8	692.2
18	Total Debt	Rp mill	543.1	11,338.7	6,975.8
19	Shareholder equity	Rp mill	8,085.4	28,157.4	(4,127.5)

Table 2A - 05
Qualitative Data
East Java Province

Description	East Java		
	Malang (D)	Malang (M)	Batu (M)
Corporate Plan (CP)			
* Already has CP	yes	yes	yes
* Latest year of CP was perpared/up dated	2005	2005	2004
* CP used as one of basic consideration for yearly programs?	yes	yes	yes
PDAM Orientation to Customer			
* Ever been conducted Customer Survey Satisfaction	yes	yes	yes
* Latest year to conduct CSS	2003	2004	2004
* Any part of PDAM organization structure that responsible to handle/	yes	yes	yes
handle complaint/information from customers/communities			
Training			
* Generally training attended by PDAM staffs, give benefits to PDAM	yes	yes	yes
* PDAM staffs still need trainings	yes	yes	yes
Inter-regional issue of PDAM			
* Any inter-regional/national issue that required to be discussed/solved	no	yes	yes
* If Any, write down	-	water	raw
		sources	water
		tariff	sales to
			others
Bench-marking			
* PDAM has been joining Bench-marking program	not yet	yes	not yet
* Reason does not join Bench-marking program	not priority	-	not priority
* PDAM get the benefits by joining BM program	-	yes	-
* BM useful for making yearly PDAM targets	-	yes	-
Water Quality monitoring			
* PDAM monitor water quality	yes	yes	yes
* Reason does not monitor the water quality	-	-	-
* PDAM has appropiate equipments/tools for taking a water sample	yes	yes	no
* PDAM has appropiate facilities/laboratory equipments	yes	yes	no
GIS/MIS			
* PDAM has drawings 0f sping capture/intake/Water Treatment Plant	part of	yes	yes
* Accuracy of distribution network drawings	85%	70%	35%
* PDAM has been using GIS since	not yet	not yet	not yet
Water Loss (NRW)			
* NRW level already urgent to be handle	yes	yes	yes
* PDAM has yearly target to reduce NRW level	yes	yes	yes
* PDAM conduct reducing NRW based on programmed	yes	yes	yes
* Any part of PDAM org. structure responsible to reduce NRW	no	no	yes
* PDAM staffs that handling water losses already has proper skill	no	no	no
* PDAM has proper equipment for reducing water lossactivies	no	yes	no

Table 2A - 05
Qualitative Data
East Java Province (Cont.)

Description	East Java		
	Malang (D)	Malang (M)	Batu (M)
Tariff			
* Latest year of tariff increase	2003	2005	2001
* Current basic tariff (Rp./m3)	880	900	550
* PDAM need to evaluate present tariff in near future	no	no	yes
* Connection installation fee (Rp.000)	380	1000	380
* Possible to pay in-installments for new connection fee	yes	no	yes
Efficiency of Sub-System (IKK)			
* PDAM consider IKK as a problem for PDAM, especially from financial point of view	yes	-	-
Meter Reading & Billing			
* Any problems of meter reading (either meter reader, effectiveness, efficiency and	yes	yes	yes
and accuracy)			
* Meter reading conducting by PDAM or third parties	PDAM	PDAM	PDAM
* Average number of meter read/day/meter reader	100	200	70
* Any routine audit of meter reading	yes	yes	yes
* Any problems with billing (procedure, making bill & bill collection)	no	no	yes
* PDAM already satisfied with billing collection performance	yes	yes	no
Energy Consumption & Pressure Management			
* Percentage of energy cost from total O&M cost (not incl.depreciation)	54%	20%	35%
* PDAM consider energy cost as one of the biggest expenditure	no	yes	yes
* Need to reduce energy consumption	yes	yes	-
Production & Distribution cost			
* O&M maintenance has been doing effective and efficient	already	already	already
* Already have Standard Operation Procedure for O&M activities	part of	yes	part of
* Any installed equipment make less effective/efficiency of O&M	no	no	-
* Chemical dosing comply with raw water quality	yes	yes	yes
Acces urban poor to PDAM piped water			
* PDAM give priority to serve urban poor	yes	no	yes
* PDAM already give enough opportunity for urban poor to consume	already	already	already
clean water from PDAM			
Debit & Quality of water sources			
* Quantity of raw water sources is different during rain season and dry season	5%	no	20-30%
* Quantity of raw sources is less than previous years ago	no	no	yes
* Quality of raw water is different during rain season and dry season	yes	no	no
* Quality of raw water is less than previous years ago	no	no	no
Increasing Production capacity			
* Production capacity comply with design capacity	no	82%	yes
* PDAM need to increase production/distribution facilities	yes	yes	yes

PDAM MALANG MUNICIPALITY

PDAM of Malang Municipality has 81,263 active connections and this cover approximately 63% of the city's total population. In the coming 5 years, PDAM has set a target to serve 80% of the population by PDAM's piped water.

Total capacity of the production facility is about 1,350 lps (liter per second) where 96% of it comes from sources located outside the Malang Municipaity area. Only 4% is from wells located in Malang Municipality area. About 25% of production facilities are old, yet still functioning, as those were constructed during the Dutch colonial era. Most of the total capacity comes from Wendit spring that is located in Malang District area. The PDAM is concern with the long term utilization of the spring for both quality and quantity. They will design a plan to alter the use of the spring with other spring(s) uphill Wendit. There is a spring app. 29 km upward Wendit with an estimated capacity of 2,000 lps, where at the present time, is not utilized.

The current NRW (non revenue water) is 39%. This is attributable, among others, to inaccurate water meter at house connections. Reduction of NRW is desired, since it could help PDAM to increase its water sales and in turn its revenue.

PDAM has successfully piloted a potable water zone (ZAMP-zona air minum prima) since Aug. '04 in Blimbing housing estate of app. 1,900 connections. In practice, a post-chlorination unit is added into the system so people could easily know whether or not the water distributed meets the standard. Many customers are still not confident or uncomfortable to drink water directly from the tap without boiling. PDAM is thinking of extending the service, yet concerned that other location(s) could not be served with the same standard.
Towards ISO certification, PDAMof Blimbing received a certification from FORKAMI (water quality forum) for its laboratory. This process took app. 3 years to accomplish.

PDAM has app. 540 employees or about 6.6 staff to 1,000 customers. The target has been set to have the ratio of 5 staff to 1,000 connections. As a consequence, since 1997 no new employees have been recruited.

PDAM's financial standing appears to be healthy as it has never experienced losses. Average revenue is app. Rp.4 billion, while average monthly expenses is about Rp.3.2 billion. 55% of the profit is contributed to the local government as local revenue (PAD – Pendapatan Asli Daerah). The remaining 45% is set aside for employees as bonus (jasa produksi) and general allocation (cadangan umum) for investment purposes. The current base tariff is Rp.1,300./m3 and average tariff is Rp.1,900/m3. The (new) tariff has been in effect since April 2005.

In 2004 PDAM received Rp.29 billion loan from BNI (Bank Nasional Indonesia-state owned bank) and another Rp.19 billion from local investor for Wendit III Development to produce an an additional capacityof 500 lps. The project is expected to complete in Aug. '05. The additional capacity is planned for service expansion so that it could provide water to more people in the city.

Given the present condition, PDAM Malang is relatively in good condition. Yet, they still need to keep up the current condition or even to improve the following:

- NRW reduction
- Data base/GIS based information system improvement
- Capacity building to PDAM and other key stakeholders
- Guaranteeing raw water supply
- Raising funds for distribution expansion and house connections
- Advocacy for cross boundaries issues

PDAM MALANG DISTRICT

Currently, PDAM Malang Municipality has a total of app. 60,000 connection units, where most of them are of domestic. To supply water to those connections, PDAM produced app. 970 lps from 44 production facilities. Of those facilities, 37 units are of springs, while the remaining are from deep wells and water plants. The production facilities deliver water either through pumping devices or by gravity.

There are abundant springs across the region and hundreds of springs have been identified and the total capacity is about 3,500 lps. One of them, the Krabyakan Spring located in Lawang, has a capacity of 2,000 lps and will be offered to the district of Sidoarjo and/or Pasuruan. These two areas lack of water sources. The district of Sidoarjo alone would need up to 1,200 lps.

Although there are abundant springs in the district of Malang, ironically, PDAM of the district of Malang still purchases water from PDAM Kota Malang, while the water is originally from Wendit, that is located in the District of Malang. The main reason is because of service coverage of PDAM Kota Malang that reaches the district of Malang. Presently the water purchase is app. Rp.10 million/month, a drop from of previous price of app. Rp.22 millions/month. PDAM of the district of Malang plans to end the purchase by end of 2005 by having its own water supply.

Currently, the NRW level is very high of app. 60%. This is attributable to numerous causes, ie. old faulty water meters at household connections and leakages. In the period of 2003~2005 app. 17,000 water meters have been replaced. Non-technical factors, like inaccurate meter reading, are suspected also as contributing the high level of NRW.

The current base tariff is Rp.800/m3. There has been no tariff adjustment since 3 years ago. If affordability is taken into account, it seems that people have the ability to pay more than what they have spent now. There are some small systems developed by NGOs and other initiatives that are managed by community where tariff is as high as ie. Rp.1,700/m3. As a result, currently PDAM could only cover operational costs. There's an outstanding debt to MoF of app. 14 billions rups. During the present management, revenue have increased from app. 900 millions/month to 1.5 billion/mo. and 2 billions/mo. as 2005 target.

PDAM has a program of planting of 1,000 – 7,000 trees per year using their own funds.. In addition, PDAM has also started purchasing areas surrounding PDAM's water sources (springs) mainly for securing the springs from excessive extraction by dwellers living nearby, although conservation is not their main concern.

Although the PDAM Malang district is facing the above issues, they would like to improve their services in several areas that include:

- Corporate planning
- FS (feasibility studies) of spring utilization and water sales to neighboring region
- Basis for improvement in pursuing ISO 9001 (quality) certification
- Training and education
- Advocacy for cross boundaries issues, ie. toward termination of water sales from PDAM Malang Municipality
- Water meter reading and/or billing in line with NRW reduction

PDAM BATU MUNICIPALITY

Formerly the management of PDAM Batu Municipality was under the jurisdiction of District of Malang but in the year 2003/2004 PDAM Batu Municipality became an independent management unit since Kota Batu became a municipality. The separation is purely based on administration and political issues and not on economical considerations. Looking at the number of customers in Kota Batu, it would be very difficult to manage a PDAM as a business entity since economically it is not feasible.

PDAM has app. 8,500 connections that mainly are domestic uses. These customers are supplied through 7 systems of app. 100 lps. The quality of the springs meets the standard with only small addition of disinfectant. It is observed that several of the springs currently used by PDAM has experienced reduction in capacity, such as in Banyuning from 200 lps. to 40 lps. This worries PDAM not only for the future expansion of PDAM's service, but also the services to present customers.

Many parts of upstream areas have changed from forest to farming areas, such as in Cangar where people grow mushrooms, potatoes, and others. There is an indication that that apples farming areas tend to move to upland areas because of the cooler climate. The upstream area becomes more critical due to illegal surface mining practices by the local community.

The piping distribution network is quite old and many were constructed during the Dutch colonial era. All of the systems are interconnected to each other and water is not evenly distributed in relation to quantity and continuity. The old piping is deemed as one significant factor of the NRW. In addition, roughly about 60% water meters are not functioning. Old water meters are not readable by the meter readers

PDAM has yet to book profit, although its cash flow basis is still positive. With this condition PDAM is restrained to improve, even less expand its services. With its autonomous status of Kota Batu, the area is expected to grow quite significantly which PDAM has to see this as an obligation and challenge to grow as well.

Entirely, there are 97 employees where most of them are formerly employees of PDAM Kab. Malang. PDAM is trying to change its culture from bureaucratic to a more public

service orientation organization. PDAM has conducted 1st motivational training, EISQ (emotional, intellectual, spiritual, quotients) that will be followed with 2nd one within the next 6 months. Customers' perception on PDAM's service is measured through a simple questionnaire put at the payment points. PDAM has also started an employee performance assessment where individual is classified as jujur (honest), ikhlas (sincere), kebapakan (fatherly), bertanggung-jawab (responsibile), or bermasalah (troubled). This is not intended to get a good guy versus bad guy opposition, but rather to motivate people's to change behavior to be a more customer oriented.

With the quite new existence of PDAM Kota Batu as an independent entity, it is deemed that PDAM needs adequate assistance in broad aspects that would cover, but not limited to:

- Replacement of water meters to have accurate reading; this would be part of NRW reduction program
- Capacity building and training in several aspects not only for PDAM staff, but also for other key stakeholders
- Advocacy in cross boundaries issues
- Tariff review, PDAM Kota Batu uses tariff structures that applies in Kab. Malang as it used to belong to Kab. Malang. With the present size of its connections, it is deemed necessary to review the tariff.
- Develop a plan to secure existing raw water sources and possibly get alternatives of water sources.

APPENDIX II-B

PDAM ASSESSMENT–WEST JAVA PROVINCE

In the West Java Province there are 22 PDAMs in line with the number of District/City located in the Province. In the year of 2003, the number of production capacity installed at West Java manage by PDAMs is 14.157 lps and the effective production capacity is only 12.133 lps. Water produced during 2003 was 331.913.225 m3, the sources of which come from:

•	river	212.374.618 m3	(64.0%)
•	lake	12.033.549 m3	(3.6%)
•	spring	89.681.700 m3	(27.0%)
•	deep well	17.371.906 m3	(5.2%)
•	others	451.452 m3	(0.1%).

Based on selected watershed area , the first year assessments were conducted to 9 of 22 PDAMs in West Java, there are :

- Gunung Tangkuban Parahu – Burangrang water shed area :
  - PDAM Kab. Subang
  - PDAM Kab. Purwakarta
  - PDAM Kota Bandung
  - PDAM Kab. Bandung.

- Gunung Gede - Pangrango watershed area :
  - PDAM Kota Bogor
  - PDAM Kab. Bogor
  - PDAM Kab. Cianjur
  - PDAM Kab. Sukabumi
  - PDAM Kota Sukabumi

The year 2004's data of the assessment result of 9 PDAMs mentioned above can be seen in table 2B-01 through table 2B-05, while the assessment result of each PDAM can be seen from its descriptions.

Table 2B - 01
Water sources, Production, Distribution and Water Sold
West Java Province - Year 2004

No	Description	unit	West Java								
			Kab.	Kab.	Kota	Kab.	Kota	Kab.	Kab.	Kab	Kota
			Subang*	Purwakarta	Bandung	Bandung	Bogor	Bogor	Cianjur	S.bumi	S.bumi
1	Number of Service Area										
	* Main Area	unit	1	1	1	1	1	1	1	1	1
	* Sub Area (IKK)	unit	13	4	0	11	0	11	12	10	0
2	Number of water sources										
	* spring	unit	5	2	11	10	3	10	7	9	2
	* river/surface water	unit	1	1	6	4	3	12	3	5	1
	* deep well	unit	22	2	32	11	-	11	7	-	8
	* others (explain)	unit	-	-	-	-	-	-	-	-	-
	Total	unit	28	5	49	25	6	33	17	14	11
3	Water Sources Capacity										
	* Spring capture	l/s	216	180	170	143	320	790	452	176	200
	* Water treatment plant	l/s	50	120	2,770	516	1,100	1,180	47	180	250
	* deep well	l/s	120	14	180	56	-	129	66	-	106
	* others (explain)	l/s	-	-	-	-	-	-	-	-	-
	Total	l/s	386	314	3,120	715	1,420	2,099	565	356	556
4	Average production	l/s	191.2	220.1	2,435.3	527.7	1,154.2	1,592.7	301.1	200.7	300.7
5	Ave. Distribution	l/s	177.6	213.8	2,431.2	527.7	1,147.6	1,553.3	266.2	196.2	300.7
6	Ave. Water Sold	l/s	136.8	152.4	1,228.0	308.4	751.7	959.0	185.8	100.3	136.0
7	Water Loss	%	28%	31%	50%	42%	35%	40%	38%	50%	55%

Table 2B - 02
Population, Served, Number of Connection, Number of Employee
West Java Province - Year 2004

No	Description	unit	West Java								
			Kab.	Kab.	Kota	Kab.	Kota	Kab.	Kab.	Kab	Kota
			Subang	Purwakarta	Bandung	Bandung	Bogor	Bogor	Cianjur	S.bumi	S.bumi
1	Population										
	* total	people	1,347,113	724,560	2,230,000	4,017,582	820,707	4,602,512	1,664,551	2,178,850	290,000
	* served area	people			2,230,000	3,937,230	672,585			309,406	290,000
	* served	people	119,634	101,154	2,230,000	277,224	396,806	546,054	149,832	67,760	131,760
2	%tage served, from										
	* total population	%	9%	14%	56%	7%	48%	12%	9%	3%	45%
	* served area	%			56%	10%	59%			22%	45%
3	Number of connection	connection	19,939	16,859	143,102	46,204	67,522	91,009	24,972	13,520	23,292
4	Hour/day served	hour/day	24	24	24	24	24	24	24	24	24
5	No of employee	people	188	140	928	326	444	625	239	154	163

Table 2B - 03
Base Tariff, Average Tariff and Connection fee
West Java Province - Year 2004

No	Description	unit	West Java								
			Kab.	Kab.	Kota	Kab.	Kota	Kab.	Kab.	Kab	Kota
			Subang	Purwakarta	Bandung	Bandung	Bogor	Bogor	Cianjur	S.bumi	S.bumi
1	Base Tariff	Rp/m3	950	1,000	560	1,200	550	950	800	900	800
2	Average Tariff										
	* Year 2004	Rp/m3	2,108	1,495	2,178	1,725	1,725	1,918	2,086	1,734	1,517
	* Year 2003	Rp/m3	1,784	1,455	2,476	1,725	1,191	1,904	1,260	1,777	1,249
3	Connection fee	Rp.000	825,000	350,000	1,200,000	1,500,000	1,200,000	1,200,000	520,000	657,000	500,000

Tabel 2B - 04
Financial Data
West Java Province

No	Description	Unit	West Java								
			Kab. Subang	Kab. Purwakarta	Kota Bandung	Kab. Bandung	Kota Bogor	Kab. Bogor	Kab. Cianjur	Kab S.bumi	Kota S.bumi
1	Annual operationial expenses (not include depreciation & interest)	Rp.mill/year	7,205.1	5,694.9	69,120.4	13,152.5	29,146.5	41,780.0	8,422.3	6,426.6	5,892.3
2	Annual operating revenue	Rp.mill/year	9,624.8	7,577.4	87,223.6	22,110.8	44,175.5	66,547.6	12,089.6	5,928.0	7,169.9
3	Annual operating cost (include depreciation & interest)	Rp.mill/year	9,345.8	7,540.2	83,288.0	20,842.8	39,668.6	62,588.9	11,240.7	7,392.8	7,291.4
4	Current assests	Rp.mill	1,929.4	11,188.1	37,408.9	6,196.2	9,495.1	16,588.3	4,444.6	3,252.3	5,486.2
5	Current Liabilities	Rp.mill	1,031.1	7,310.9	149,934.7	24,344.7	10,141.6	12,938.4	677.7	1,098.3	22,233.4
6	Annual debt service	Rp.mill/year	896.5	-	14,257.4	2,163.1	4,570.6	-	361.3	-	-
7	Net operating income (before interest & tax)	Rp.mill	279.0	171.3	10,235.2	1,790.0	4,506.9	7,608.1	1,087.8	- 1,009.5	564.1
8	Historical value of tangible assets	Rp.mill	13,257.7	10,880.7	56,841.7	47,683.5	109,101.2	127,256.8	13,028.2	12,389.4	26,367.8
9	Depreciated historical value of tangible assets	Rp.mill	12,316.7	12,215.2	212,746.0	24,912.6	45,650.3	18,967.8	16,288.4	7,489.5	16,903.3
* 10	Operating income (before depreciation)	Rp.mill/year	2,419.6	1,049.1	12,555.5	8,958.3	11,435.1	24,195.0	3,306.0	- 468.3	592.1
11	Annual labour cost	Rp.mill/year	3,630.5	3,074.2	20,870.0	7,693.6	12,429.7	19,805.2	4,300.6	2,771.6	2,989.4
12	annual energy cost	Rp.mill/year	1,507.0	731.5	4,494.9	1,798.6	3,829.3	8,840.9	1,440.3	982.0	350.5
13	Revenue from annual water sales	Rp.mill/year	8,716.4	7,184.7	67,995.8	16,772.5	40,892.2	58,005.1	11,402.9	5,486.0	6,506.8
14	Year end accounts receivable	Rp.mill/year	1,190.5	1,441.0	17,470.6	5,578.5	5,621.7	8,496.1	2,038.6	1,487.7	4,675.2
15	Revenue from annual domestic water sales	Rp./year	5,989.4	6,384.9	60,840.2	12,100.5	20,901.7	49,197.0	7,336.7	4,818.2	497.4
16	Revenue from annual social water sales	Rp./year	223.6	301.8	9,177.9	482.8	855.2	2,863.7	307.8	57.2	16.7
17	Revenue from annual commercial & industry water sales	Rp./year	2,503.4	497.6	15,229.8	1,105.6	16,600.5	5,944.4	3,758.4	610.5	32.6
18	Average water charge	Rp./m3	1,423.0	1,495.6	2,178.0	387.9	1,618.1	1,918.0	2,086.0	1,734.0	1,279.6
19	Average water charge, previous year	Rp./m3	1,226.0	1,455.5	2,476.0	-	1,083.2	1,904.0	1,260.0	1,777.0	990.7
20	Minimum water tariff	Rp./m3	950 & 1300	1,000.0	560.0	1,200.0	550.0	950.0	800.0	899.0	600.0
21	Total debt	Rp.mill	4,013.3	1,295.0	149,934.7	10,871.5	26,551.6	16,620.0	3,159.4	2,197.7	7,546.5
22	Shareholder equity	Rp.mill	21,862.0	6,189.7	50,601.8	32,062.3	27,593.0	107,256.8	21,069.7	16,051.3	5,137.9

Table 2B - 05
Qualitative Data
West Java Province

Description	P.karta (D)	Bandung (M)	Bandung (D)	Bogor (M)	Bogor (D)	Cianjur (D)	S.bumi (D)	S.bumi (M)
Corporate Plan (CP)								
* Already has CP	yes	yes	yes	yes	yes	yes	yes	yes
* Latest year of CP was perpared/up dated	1998	2005	2005	2004	2000	2001	?	2003
* CP used as one of basic consideration for yearly programs?	yes	yes	no	yes	no	yes	yes	not yet
PDAM Orientation to Customer								
* Ever been conducted Customer Survey Satisfaction	yes	yes	yes	yes	yes	yes	yes	yes
* Latest year to conduct CSS	1998	1999	2002	2004	2002	1999	?	2003
* Any part of PDAM organization structure that responsible to handle/	yes	yes	yes	yes	yes	yes	yes	yes
handle complaint/information from customers/communities								
Training								
* Generally training attended by PDAM staffs, give benefits to PDAM	yes	yes	yes	yes	yes	yes	yes	yes
* PDAM staffs still need trainings	yes	yes	yes	yes	yes	yes	yes	yes
Inter-regional issue of PDAM								
* Any inter-regional/national issue that required to be discussed/solved	yes	yes	yes	yes	yes	yes	no	no
* If Any, write down	tariff	raw	raw	raw	raw	raw		raw
		water	water	water	water	water		water
		asset		regiona-	tariff	tariff		tariff
		debt		lization	splite			
Bench-marking								
* PDAM has been joining Bench-marking program	yes	not yet	yes	yes	yes	not yet	yes	yes
* Reason does not join Bench-marking program	-	no infor-	-	-	-	no infor-	-	-
		mation				mation		
* PDAM get the benefits by joining BM program	yes	-	yes	yes	yes	-	yes	yes
* BM useful for making yearly PDAM targets	yes	-	yes	yes	yes	-	yes	yes
Water Quality monitoring								
* PDAM monitor water quality	yes	yes	yes	yes	yes	yes	yes	yes
* Reason does not monitor the water quality	-	-	-	-	-	-	-	-
* PDAM has appropiate equipments/tools for taking a water sample	yes	yes	yes	yes	yes	no	no	no
* PDAM has appropiate facilities/laboratory equipments	no	yes	yes	no	yes	no	no	no
GIS/MIS								
* PDAM has drawings Of sping capture/intake/Water Treatment Plant	yes	yes	yes	yes	yes	yes	yes	yes
* Accuracy of distribution network drawings	75%	?	75%	60%	80%	90%	75%	85%
* PDAM has been using GIS since	not yet	not yet	2001	yes	2004	not yet	not yet	not yet
Water Loss (NRW)								
* NRW level already urgent to be handle	yes	yes	yes	yes	yes	yes	yes	yes
* PDAM has yearly target to reduce NRW level	no	yes	yes	yes	yes	yes	yes	yes
* PDAM conduct reducing NRW based on programmed	no	yes	yes	yes	yes	yes	yes	yes
* Any part of PDAM org. structure responsible to reduce NRW	no	no	no	yes	yes	no	yes	yes
* PDAM staffs that handling water losses already has proper skill	no	yes	no	no	yes	no	no	yes
* PDAM has proper equipment for reducing water lossactivies	no	no	no	no	no	no	no	no

Table 2B - 05
Qualitative Data
West Java Province (Cont.)

Description	P.karta (D)	Bandung (M)	Bandung (D)	Bogor (M)	Bogor (D)	Cianjur (D)	S.bumi (D)	S.bumi (M)
Tariff								
* Latest year of tariff increase	2001	2003	2001	2004	2002	2004	2000	2004
* Current basic tariff (Rp./m3)	1000	1200	560	550	950	800	899	800
* PDAM need to evaluate present tariff in near future	yes	yes	yes	yes	yes	yes	yes	yes
* Connection installation fee (Rp.000)	541	1298	1200	1200	1200	500	657	500
* Possible to pay in-installments for new connection fee	no	yes	no	no	no	no	yes	no
Efficiency of Sub-System (IKK)								
* PDAM consider IKK as a problem for PDAM, especially from financial point of view	no	-	no	-	yes	yes	no	-
Meter Reading & Billing								
* Any problems of meter reading (either meter reader, effectiveness, efficiency and	yes	yes	yes	no	yes	yes	yes	yes
and accuracy)								
* Meter reading conducting by PDAM or third parties	PDAM	PDAM	PDAM	PDAM	PDAM	PDAM	PDAM	PDAM
* Average number of meter read/day/meter reader	30	100	?	150	150	100	100	100
* Any routine audit of meter reading	not yet	not yet	not yet	not yet	not yet	yes	not yet	not yet
* Any problems with billing (procedure, making bill & bill collection)	yes	no	no	no	no	no	no	yes
* PDAM already satisfied with billing collection performance	no	no	no	yes	no	no	no	no
Energy Consumption & Pressure Management								
* Percentage of energy cost from total O&M cost (not incl.depreciation)	13%	7%	14%	13%	21%	17%	15%	6%
* PDAM consider energy cost as one of the biggest expenditure	yes	yes	yes	yes	yes	no	yes	yes
* Need to reduce energy consumption	no	yes	yes	yes	yes	yes	yes	yes
Production & Distribution cost								
* O&M maintenance has been doing effective and efficient	not yet	not yet	not yet	already	not yet	yes	already	already
* Already have Standard Operation Procedure for O&M activities	part of	part of	part of	part of	part of	complete	part of	part of
* Any installed equipment make less effective/efficiency of O&M	no	no	no	no	no	no	?	yes
* Chemical dosing comply with raw water quality	yes	yes	yes	yes	yes	yes	yes	yes
Acces urban poor to PDAM piped water								
* PDAM give priority to serve urban poor	yes	yes	yes	no	no	no	no	no
* PDAM already give enough opportunity for urban poor to consume	not yet	already	already	not yet	already	already	not yet	already
clean water from PDAM								
Debit & Quality of water sources								
* Quantity of raw water sources is different during rain season and dry season	35%	30%	20%	10%	10-20%	40%	?	60%
* Quantity of raw sources is less than previous years ago	35%	20%	105%	29%	10-20%	25%	?	40-60%
* Quality of raw water is different during rain season and dry season	yes	yes	yes	no	YES	no	?	yes
* Quality of raw water is less than previous years ago	yes	no	yes	no	no	no	?	no
Increasing Production capacity								
* Production capacity comply with design capacity	no	yes	no	yes	80%	90%	?	yes
* PDAM need to increase production/distribution facilities	yes	yes	yes	yes	yes	yes	yes	yes

PDAM SUBANG DISTRICT

Subang District area is 205.176 hectare or 4, 64% of West Java area, consisting of 22 sub-districts and 250 villages/*kelurahan*, with total population of 1.347.113 people.

PDAM Subang district serve 14 units service area with total customers of 19,939, and was increased to 21,215 service units in the year of 2004. From the 14 areas/units of PDAM service, 3 of them use spring water sources (Subang, Jalan Cagak and Cisalak), and the rest from deep wells. All water distributions use pump, except the service area of Subang.

The water production in the year of 2003 was 6,028,246 m3/year (average 191.1 lps), the distributed water was 5,600,181 m3/year (average 177.6 lps) and the water sold was 4,314,263 m3/year (average 136.8 lps), and non revenue water was 28.5%.

Units service area, type of water sources, water production, distribution and water sold as well as number of connections for each unit service area of PDAM Subang can be seen in table 1.1.

Table 1.1. Branch/IKK, Water Sources, Production, Distribution, Water Sold and Number of Connection, PDAM Subang District, Year 2003

No	Branch/ IKK	Water Source	Production (m3)	Distribution (m3)	Water Sold (m3)	Connection (unit)
1	Subang	Spring	2,169,033	1,615,300	1,030,558	5,240
2	Pamanukan	Deep well	829,177	751,334	645,333	2,446
3	IKK Pegaden	Deep well	70,935	70,935	52,108	261
4	IKK Pusakanegara	Deep well	129,031	113,865	80,785	476
5	IKK Purwadadi	Deep well	120,898	120,898	57,769	297
6	IKK Binong	Deep well	92,110	92,110	66,737	336
7	IKK kalijati	Deep well	170,407	170,407	144,707	783
8	Compreng	Deep well	234,553	218,204	189,530	1,222
9	IKK Cipunagara	Deep well	139,153	139,153	105,136	599
10	Jalan Cagak	Spring	476,396	456,776	392,896	2,129
11	Cisalak	Spring	709,668	582,653	460,472	2,453
12	Aqua/Blanakan	Deep well	427,366	427,366	427,366	759
13	IKK Sagalaherang	Deep well	284,686	283,167	232,738	1,271
14	Ciasem	Deep well	574,832	558,013	428,128	1,667
	Total		6,028,246	5,600,181	4,314,263	19.939

New connection fee is Rp 850.00,- and existing base tariff since the year 2003 is Rp 950/m3. Average water consumption was 16 m3/month/connection while average tariff was Rp. 2,108/m3 and total operating cot Rp 2,260 per m3

The PDAM Kab. Subang financial condition is fair as shown by the operating ratio indicator of 133.58% and operating ratio towards sold water only at 93,27 %, debt equity ratio of 18,36% that means it still has a capital adequacy.

In year 2004, PDAM Subang has 188 employees.

From the assessment result, considering both technical and non-technical conditions, the programs required for the first year would be:

- From the financial condition pint of view, by considering operating ratio towards water sold that is still less 6,73% for the FCR, the effort to be done to achieve FCR from the water sold is to study the tariff through tariff adjustment and customer classification.
- To increase the production capacity for the Pamanukan branch. The people in this area have difficulties to get alternative clean water source except from the PDAM. At present, the PDAM of Subang has a production capacity of 50 lps, while the demand of the people is very high.
- To replicate GIS program to other branches. PDAM Subang has finished the GIS program for the Subang Kota branch, and this has positive influence to the data base improvement.
- There are many sources of raw water, especially springs, in Subang area. Considering it's location near Kota Bandung, then joint-cooperation to provide raw water by PDAM Subang for Kota Bandung could be assessed. Therefore a regional cooperation in utilizing raw water base could become a good issue.
- To enhance the capability, knowledge and skill of PDAM Staffs through trainings and workshops, both technical and non-technical management as well as that of motivational.
- To follow up the participation in the Benchmarking program.

PDAM PURWAKARTA DISTRICT

Purwakarta District with the size of 971,72 km2 or 2,81% of the West Java area, consist of 17 sub-districts and 192 villages/kelurahan, with a total population of 724.560 people by the year of 2004.

By the end of 2004, PDAM Purwakarta District serve 5 units of service area with total 16.859 customers, that are being served by 5 water sources with total installed capacity of 314 lps, and 220 lps of its has been utilizing.

- Intake waduk Jatiluhur, 120 lps
- Deep well Munjul Jaya, 7 lps
- Deep well Ciseureuh, 7 lps
- Spring, Cigoong, 60 lps
- Spring Cilembangsari, 120 lps

The water production in the year of 2004 was 6,942,596 m3/year (average 220.1 lps), water distribution was 6,741,344 m3/year (average 213.8 lps) and the water sold was 4,805,438 m3/year (average 152.8 lps). And water loss was 28.7%. The water is distributed by gravitation.

Type of water sources, water production, distribution and sold water as well as the number of connection for each service area of PDAM Purwakarta can be seen in table 2.1

Table 2.1. Branch/IKK, Water Sources, Production, Distribution, Water Sold and Number of Connection, PDAM Kabupaten Purwakarta, Year 2004

No	Branch/ IKK	Production (000 m3)	Distribution (000 m3)	Water Sold (000 m3)	Connection (unit)
1	Purwakarta	5,950	5,749	4,004	14,054
2	Wanayasa	766	766	613	2,0844
3	Campaka	25	25	20	57
4	Pasir Angin	149	149	125	537
5	Plered	53	53	44	193
	Total	6,943	6,742	4,806	16,889

New connection fee is Rp. 350,000,- and base tariff is Rp. 1.000 per m3. The average consumption in year 2004 was 24 m3/month/connection and the average tariff was Rp. 1.495 per m3 since total operating cost was Rp 1,577 per m3

The financial condition of PDAM Kab. Purwakarta was also fair as shown by the operating ratio indicator of 133.06% Full Cost Recovery (FCR), debt equity ratio of 20.92% which means the PDAM still has capital adequacy.

Currently the number of PDAM Purwakarta district employees is 140 people.

From the assessment result, considering either technical and non-technical conditions, the programs that need to be done in the first year are:

- Conduct tariff review, especially through customer re-classification approach. At present, there is only one type of tariff structure for household customers of PDAM Purwakarta, resulting in no cross-subsidy from the household customers classification.
- Increase revenue from accurate reading of the connection meter and the billing system as well. An effort to be done in this program could be to give one reading area to a third party as a pilot project.
- Improve water quality as the result of the process or that which is distributed to customers through sufficiency in the lab. equipments, periodical monitoring of water quality at the distribution network and randomly at the customers' connections.
- Enhance of capability, knowledge and skill of PDAM Staffs through training or workshop - for technical and non-technical as well as motivation training.
- To continue the participation in the Benchmarking program.

PDAM BANDUNG MUNICIPALITY

Bandung City area is 16.729 hectare or 0,48% of the West Java area, consists of 26 sub-districts and 139 villages, with total population of 2.230.000 people in the year 2003.

By the end of 2004, PDAM Kota Bandung provides 143.102 connection units, serving 1,240,000 people or 55% of the total population of West Java. 16% of the customers are served alternately.

The sources of raw water for PDAM Kota Bandung with total installed production capacity is 3,120 lps, consists of 1 spring in Lembang with 170 lps installed capacity, 6 surface waters (WTP Badak Singa with capacity 1,800 lps from Cisangkui and Cikapundung rivers, WTP Pakar with capacity 600 lps from Cikapundung river, WTP Dago with capacity 60 lps, WTP Cibeureum with capacity 40 lps, WTP Panjalu with capacity 20 lps and WTP Cirateun with capacity 5 lps), and 32 deep wells.

Water production volume in the year of 2004 was 76,798,116 m3/year (average of 2,435 lps), distributed water 76,671 m3/year (average of 2,431 lps) and the sold water was 38,727,756 m3/year (average of 1, 228 lps). So the water loss in 2004 was 50%.

Besides serving the clean water, PDAM Kota Bandung is also managing the waste water system. Its service area covers 67% of the administrative area of Kota Bandung with 87,250 customers.

New connection fee is Rp 1.2 million and base tariff is Rp 560/m3, since average consumption of customer in year 2004 was 23 m3/month/connection. The average tariff was Rp. 2.178 per m3 while the whole operational cost was Rp. 2.151 per m3 of water.

From operating ratio point of view, PDAM Kota Bandung has achieved FCR, i.e. 101,26%. One of the reasons was due to the revenue derived from the waste water that valued about 30% from the water sold. The debt equity ratio of 108,60 indicates that the company condition have no more capability to borrow money for its business development because capital ratio owned by the company is less than its obligations.

The total number of employees of PDAM Kota Bandung is 928 persons, including 112 people who manage the waste water.

From the assessment result, after considering both technical and non-technical conditions, the first year programs needed would be:

- The water loss level is very high which has cost PDAM Kota Bandung a revenue lost equal to Rp. 6.886.701.145 per month. So the program that should be prioritized is the effort to reduce the water loss.
- To increase the production capacity to enlarge the service coverage that was still low for the city size which is expected to reach 80% of the population.
- To finalize the customers mapping with GIS, in order to know precisely the number of clean water customers who have not received waste water service, because they still have to pay the 30% of their clean water consumption anyway. This condition may result in claim by the public to the PDAM Bandung.
- To draft a regulation that calculated a cost that should be paid by the clean water customers who consume 0 m3.
- The percentage of clean water consumers who consume 0 m3 that consisted of 20% should be studied further due to the loss of revenue suffered by the PDAM equal to 20% or about Rp. 1.22.568.624 per month.

PDAM BANDUNG DISTRICT

Bandung District has a wide area of 3073 km2 with 43 sub-districts and total population of 4.017.582 people. By the end of 2003, PDAM Bandung district has 46.204 connection units or equivalent with 277.224 people served (assuming 1 connection serves 6 people). It means the coverage level of PDAM Kab. Bandung reached only 7% of population in the served area with estimated population of 2.826.104 persons.

The sources of raw water for PDAM Bandung District are from springs with installed capacity of 142,8 lps, rivers/surface water of 516 lps and deep wells of about 56 lps. Total installed capacity is about 689,8 lps since production capacity is 559,4 lps.

Water produced volume in the year of 2003 was 16.642.625 m3, water distributed was 16.641.888 m3 and water sold was 9.724.528 m3. In the other words, the level of water loss in year 2004 was about 42%.

The financial condition of PDAM Kab. Bandung in year 2003 was considered not healthy as shown by the operating ratio indicator towards the selling of water of 80,47% and the number of periods of payment was 92 days. Average water consumption by the customers per month was 19 m3, since average tariff was Rp. 1.725 per m3 while the overall operating cost was Rp. 2.274 per m3.

From the assessment result by considering both technical and non-technical conditions, the needefirst year programs would be:

- The high level of water loss is 41% beyond the National average water loss which is about 32%.
- The length of periods of payment of 92 days, that means the current month's reveivable will achieve 100% after the 92days. This condition indicate the billing efficiency is less than 80%.

PDAM BOGOR MUNICIPALITY

The area of Bogor City is 118.50 km2 or 0,35 % of the West Java province area. The City of Bogor consists of 6 sub-districts with a total population in year 2004 of about 820,000 people.

By the end of 2004 PDAM Bogor served 67.522 connection units, equal to serving 396,806 people, or 48% of the total population.

The sources of raw water for PDAM Bogor consist of 3 springs (Kota Baru, Bantar Kambing and Tangkil) with total capacity of 320 l/s, and 3 WTP units (Tegal Gundi-Ciliwung river, Limus Nunggal-Cisadane river and Cipaku-Cisadane river) with total 1,100 l/s. Currently WTP Tegal Cigundi that has capacity 20 l/s, can not be utilized due to the quality of its raw water from Ciliwung river does not meet the standard requirements.

The water produced volume in the year 2004 was 36,398,116 m3/year (an average of 1,154 lps), distributed water was 36,190,464 m3/year (an average of 1,147 lps) and the water sold was 23,705,385 m3/year (an average of 751 lps), with the app. water loss in 2004 was 35%.

New connection fee is Rp 1,200,000 and base water tariff is Rp 550/m3. Average consumption in year 2004 was 29 m3/month/connection, since average tariff was Rp. 1.725 per m3, while the total operating cost was Rp. 1.673 per m3.

The financial condition of PDAM Kota Bogor in year 2004 was good as shown by operating ratio indicator towards the water sold of 103,08% (FCR), and the periods of payment was 46 days.

In year 2004 PDAM Bogor has 444 employees.

From the assessment result, after considering both technical and non-technical conditions, the needed programs for the first year would be:

- Investment on transmission pipe for about 4 km considering the production capacity of IPA Dekeng that has been able to produce 800 lps of water while the existing transmission pipe could only distribute 400 lps of water.
- Reclassification of customers to increase revenue. The present composition of total household customers is 29% for RT-1, 52% for RT-2 and 19% for RT-3.
- Corporate plan is needed as a reference for PDAM future development because the corporate plan of the year 2000-2005 has ended.
- The water source of Tangkil with 170 lps and Batu Nunggal of 170 lps in the GEDEPAHA cathment area during dry seasons drastically decrease their quantity to 90 lps, so as an improvement program for the catchment area or that of an Inter Regional Issue are needed.
- Tariff adjustment as to be able to pay debt. With the existing tariff and the reserved of revenue to pay debt is difficult enough or to reschedulling the debt instead.

PDAM BOGOR DISTRICT

The area of Bogor District is 2.388.93 km2. It consists of 30 sub-districts with a total population of 4.602.512 people. By the end of 2004 PDAM Kab. Bogor has 91.009 connection units or equivalent with 546.054 served customers (1 household = 6 people). This conclude that the level of PDAM Kab. Bogor's coverage reached only 11,86% population of the administrative area.

PDAM Kab. Bogor consists of 12 Branches, 4 of them serve Kota Depok and 8 branches serve Kabupaten Bogor.

Total installed production capacity of PDAM Kab. Bogor is 2,098 lps, consist of springs with installed capacity of 790 l/s, deep wells of 129 l/s and from the rivers/surface water of 1.180 l/s.

The volume of water produced in 2004 was 50.226.301 m3, distributed water was 48.984.687 m3 and the sold water was 30.243.470 m3.The production capacity is 1.732 lps. The level of water loss at PDAM Kab. Bogor app. 38,26% and is higher than NRW national level.

New connection fee is Rp 1,200,000 and base water tariff is Rp 950/m3. Average consumption in year 2004 was 28 m3/month/connection, since average tariff was Rp. 1.918 per m3, while the total operating cost was Rp. 2.070 per m3.

The financial condition of PDAM Kab. Bogor in year 2004 was good as shown by operating ratio indicator towards all revenue from water and non-water of 106,32%, and the periods of payment was 47, and debt equity ratio was 15,46%. Thus it still has capital adequacy to increase its services through investment loan.

From the assessment result after considering both technical and non-technical condition, the needed first year programs would be:

- The 38,26% water loss is very high, so every month PDAM Kab. Bogor suffers a lost of revenue equal to Rp. 2.995.471.184. So a program that should be prioritized is that which could reduce the water loss.
- There are still idle capacity of 366 lps, bearing in mind the assumption that the consumption per customer is 28 m3 per month and 38% level of water loss.

PDAM CIANJUR DISTRICT

Total area of Cianjur District is 3.501 km2, It consists of 24 sub-districts with a total population of 1.664.551 people.

By the end of 2003 PDAM Cianjur district served 23,711 connection units and during the year of 2004 it increased into 24.972 units.

PDAM Cianjur district cover 13 branches/units with 564.5 lps of Installed water production capacity, as shown in table 7.1. Although the capacity of water production installed for Cianjur and Pacet branch is big enough, but actually its can not utilized as installed capacity. It happening due to additional water user and decreasing debit year of the springs year to year. In dry season Cianjur branch only able utilize 200 l/s of 300 l/s installed, and Pacet branch only permitted to utilize 25 l/s from 120 l/s water production capacity installed.

Table 7.1. Water Sources and Water Production Capacity
PDAM Cianjur District, Year 2004

No	Branch/Unit	Installed Water Production Capacity (l/s)			
		Spring	Deep Well	River	Total
1	Cianjur	300	-	-	300
2	Pacet	120	-	36	156
3	Ciranjang	-	40	-	40
4	Cikalong	15	-	-	15
5	Bojong Picung	-	3.5	-	3.5
6	Hegarmanah	-	6.5	-	6.5
7	Ciherang Kencana	-	13	-	13
8	Korpri	-	3	-	3
9	Cibeber	-	-	5	5
10	Sukanagara	-	-	5.5	5.5
11	Tanggeung	5	-	-	5
12	Warung Kondang	8	-	-	8
13	Bumi Emas	4	-	-	4
	Total	452	66	46.5	564.5

The water produced in year 2004 was 9,494,444 m3/year, distributed 8,394,403 m3/year and the water sold is 5,860,130 m3/year, and water loss was 38.3%.

Table 7.2 Water Production, Distribution and Sold,
PDAM Cianjur District, Year 2004

No	Branch/Unit	Production		Distribution		Sold		NRW
		m3	l/s	m3	l/s	m3	l/s	%
1	Cianjur	6,267,456		5,246,450		3,444,039		
2	Pacet	1,029,559		1,029,189		709,842		
3	Ciranjang	830,225		810,802		540,216		
4	Cikalong	395,198		365,999		332,167		
5	Bojong Picung	86,969		80,872		70,801		
6	Hegarmanah	64,434		64,434		57,926		
7	Ciherang Kencana	99,429		99,429		88,268		
8	Korpri	219,620		219,620		183,970		
9	Cibeber	100,914		99,696		93,696		
10	Sukanagara	110,096		107,625		96,046		
11	Tanggeung	83,872		78,240		67,986		
12	Warung Kondang	96,304		90,406		73,532		
13	Bumi Emas	101,641		101,641		101,641		
	Total	9,494,444		8,394,403		5,860,130		38.3

New connection fee is Rp 520,000 and base water tariff is Rp 800/m3. Average consumption in year 2004 was 18 m3/month/connection, since average tariff was Rp. 2,086 per m3, while the total operating cost was Rp. 2.056 per m3.

The financial condition of PDAM Cianjur in the year of 2004 was good, as shown by operating ratio indicator towards sold water of 101,44%, the periods of payment of 65 days and the debt equity ratio of 14,99% so it still has capital adequacy to increase services through investment loan.

Number of employees PDAM Cianjur is 239 persons.

From the assessment result with considering both technical and non-technical condition, the needed first year programs would be:

- The source of raw water for IPA Cibodas is very limited. The installed capacity is 135 lps but the the water that could be taken is only 35 lps, so the IPA could only operate at 35%.
- The water loss of 51% is still very high.
- The optimalization of IKK system that still in the loss and the increase readability of the water meter at the customers houses.

PDAM SUKABUMI DISTRICT

By the end of 2004 PDAM Sukabumi District serve 13,520 connections or equal to 67,760 people. If compared to the number or population in the service area, those that are being served only about 21,9%.

Installed production capacity of PDAM Kab. Sukabumi is about 56 lps, consists of springs with installed capacity of 176 lps, and from river/surface water of 180 lps.

The volume of water produced during the year of 2004 was 6,330,406 m3/year (average of 201 lps), distributed 6,186,087 m3/year (average of 196 lps) and the water sold was 3,164,547 m3/year (100 lps). From those figure we could calculate that average water loss was 51%.

PDAM Sukabumi manage 11 served area units, i.e. Pelabuhan Ratu, Cibadak, Cicurug, Cikembar, Parung Kuda, Kelapa Nunggal, Bojong Lopang, Sagaranten, Nagrak, Cisolok and Tenjo laut, with water production for the year or 2004 as shown in table 8.1.

Table 8.1. Water Production From each Working Unit
PDAM Kabupaten Sukabumi, Year 2004

No	Unit	Production		
		M3/year	l/s	%
1	Pelabuhan Ratu	1,715,322	54.4	27.1
2	Cibadak	1,193,691	37.9	18.9
3	Cicurug	1,261,440	40.0	19.9
4	Cikembar	997,950	31.6	15.8
5	Parung Kuda	437,950	13.9	6.9
6	Kelapa Nunggal	315,636	10.0	5.0
7	Bojong Lopang	7,236	.2	0.1
8	Sagaranten	10,292	.3	0.2
9	Nagrak	198,232	6.3	3.1
10	Cisolok	140,102	4.4	2.1
11	Tenjo laut	52,903	1.7	0.8
	Total	6,330,405	200.7	100

New connection fee is Rp. 607,000,- and the base water tariff is Rp. 900/m3. Average water consumption is 19 m3/month/connection and average tariff Rp. 1.734 per m3 while the total operating cost is Rp. 2.336 per m3.

The financial condition of PDAM Sukabumi in year 2004 was considered not good, as shown by operating ratio indicator towards the sold water of 74,21% and payment periods of 92 days

The number of employees in the year 2004 is 154 persons.

From the assessment result after considering both technical and non-technical conditions, needed programs for the first year would be:

- The level of water lost of 51% is very high, meaning every month the PDAM Kab. Sukabumi suffers a lost of revenue equal to Rp. 436.612.530. The program that should be prioritized is an effort to reduce the water loss.
- The idle capacity of 210 lps that is still high with the assumption of 20 m3 consumption per customer/month and level of water loss at 40%, then the needed capacity to meet the assumption is only 146 lps.
- The customers reclassification to increase revenue. The composition of household customers at present is only one classification.

PDAM SUKABUMI MUNICIPALITY

The size of Sukabumi City area is 48 km2, consists of 4 sub-districts with a total population of 290.000 people in the year 2004.

By the end of 2004 PDAM Sukabumi serve 23.292 connection units or equal to serve 131,760 people. In other words, the number of population that could be served is 45% of the total.

The sources of raw water for PDAM Sukabumi consist of 2 springs (Cigadog and Cirumput) with installed capacity of 200 lps, 8 units of deep wells with 106 lps capacity and from Cigunung river with 250 lps, so the total installed capacity is 556 lps.

The water production/distribution in the year of 2004 is 9,481,361 m3/year (average of 300 lps) and the water sold is 4,288,285 m3/year (136 lps). So the level of water loss at PDAM Kota Sukabumi is 55%.

New new connection fee is Rp. 400,000,-. And base tariff is Rp. 600 per m3. Average water consumption per month in the year was 16 m3 with and average tariff was Rp. 1.517 per m3, while the total operating cost is Rp. 1.700 per m3.

The financial condition of PDAM Kota Sukabumi in year 2004 was considered not good. Such is shown by the operating ratio indicator towards the sold water of 89,24% and payment periods was 238 days

In the year of 2004, the number of employees is 163 persons.

From the assessment result by giving attention to the technical and non-technical conditions, the needed first year program would be:

- The lost of water is very high. Every month the PDAM Kota Sukabumi suffers a lost of revenue equal to Rp. 1.101.071.595. The program that should be prioritized is the effort to reduce the lost of water.
- The idle capacity of 200 lps that is still high, with an assumption of 20 m3 per customers consumption per month and level of water loss at 40, so the needed capacity to meet the assumption is only 237 lps.
- Reclassification of customers to increase the present revenue, through rearrangement of household customers classification.
- About 10.000 of customers consume less than 10 m3 water per month and about 3.500 customers who have 0 m3 consumption. These need to be studied.
- The quantity fluctuation of Batu Karut spring that only produces 30 – 40 lps during dry seasons or drop of 70%.

APPENDIX II-C

PDAM ASSESSMENT– WEST SUMATRA PROVINCE

Initially, the assessment in West Sumatra would be conducted at the same time for 5 PDAMs, PDAM Padang municipality , PDAM Solok municipality, PDAM Solok district, PDAM Bukit Tinggi municipality and PDAM Tanah Datar district . Assessment of PDAM Padang was done on July/August, due to the condition of PDAM Padang, where at the beginning there were difficulties in obtaining data from PDAM Padang,

The result of the assessment in West Sumatra Province indicated an interesting finding for which almost all clean water system managed by the assessed PDAM does not installed master meters at the inlet of the distribution pipe, so the volume of water produced and or distributed is not known. The data from PDAM on the volume of water produced or lost were only estimation.

Updating some data's was also not being done due to the fact that there was seemingly an "idle" capacity of water sources. This happened because the data on water source discharge that is being used is the data from previous recording and the current recording indicated that there is a decrease in the water discharge.

What is also difficult in the assessment is that the data from technical and financial department are different. Furthermore, there are some locations with water distribution services less than 12 hours/day. This is an indication that the management of the respective PDAM needs improvement.

Table 2C-01. Water Source, Production, Distribution, Sold Water and Water Loss, West Sumatra Province - Year 2004.

No	Description	PDAM				
		Padang Municipality	Solok Municipality	Solok District	Bukit Tinggi District	Tanahdatar Municipality
1	Number of Service Area					
	* Main Area	1	1	1	1	1
	* Sub Area (IKK)	-	-	12	-	10
2	No of Water Prod. Sources					
	* spring	-	4	12	2	11
	* river	8	1	5	1	0
	* deep well	12	-	-	3	0
	* others	-	-	-	1	0
	Total	20	5	17	7	11

No	Description	PDAM				
		Padang Municipality	Solok Municipality	Solok District	Bukit Tinggi District	Tanahdatar Municipality
3	Water Production Capaci (l/s)					
	* spring	-	180*	125	151*	303
	* river	970	40	35	40	0
	* deep well	243	-	-	23*	0
	* other	-	-	-	5	0
	Total	1,212	220		219	303
4	Average Production (l/s)	784.4	81.6	57.1	151	72
5	Ave. Distribution (l/s)	784.4	69.6	57.0	137	72
6	Ave. Water Sold (l/s)	504.8	52.5	38.9	108	55.8
7	Water Loss (%)	34.3	35.6	31.9	28.0	23.0

Table 2C - 02. Population, Population Served, No of Connection and no of PDAM Employee, West Sumatra Province - Year 2004.

No	Description	PDAM						
		Padang Muni-cipality	Solok Muni-cipality	Solok District		Bukit Tinggi M.cipality	Tanah datar District	
				Main	IKK		Main	IKK
1	Population							
	* Total	776,000	66,430	20,735	313,090	98,511	36,183	266,627
	* Served Area	663.600	54,480	13,378	101,315	88,670	31,791	82,325
	* Served	477.935	32,664	11,370	40,370	50,540	29,440	63,230
2	%tage served, from							
	* total population	62	49	55	13	51	81	24
	* served area	72	60	65	40	57	92	77
3	No of connection	52.279	5,618	1,446	5,236	9,518	5,798	11,966
4	Hour/day served	24	12	24	8	12	24	24
5	No of employee	299	48	83		78	106	

Table 2C - 03. Base Tariff, Average Tariff and Connection fee West Sumatra Province - Year 2004

No	Description	PDAM				
		Padang Municipaility	Solok Municipality	Solok District	Bukit Tinggi Municipality	Tanah Datar District
1	Base Tariff (Rp/m3)	800	550	450	350	350
2	Average Tariff (Rp/m3)					
	* Year 2004	1,931	1,013	1,107	959	1,137
	* Year 2003	1,725	1,102	871	957	1,115
3	Connection fee (Rp)	850,000	748,000	550,000	600,000	265,000

Table 2C - 04. Financial Datas (Rp. Mill), West Sumatra Province – Year 2004

No	Description	Unit	PDAM				
			Padang Muni-cipality	Solok Muni-cipality	Solok District	Bukit Tinggi m.cipality	Tanah Datar District
1	Annual operation ex-penses (not include depreciation & interest)	Rp.mill/ Year	35,055.9	2,100.1	1,340.8	2,861.1	2,487.3
2	Annual Operating reve-nue	Rp.mill/ Year	38,774.0	1,678.9	1,358.8	3,347.5	3,318.7
3	Annual operating cost (include depreciation & interest)	Rp.mill/ Year	38,642.4	2,955.3	1,851.9	3,282.4	3,162.6
4	Current assest	Rp mill	NA	739.3	NA	1,639.9	1,423.5
5	Current liabilities	Rp mill	79,208.1	1,601.8	NA	1,060.3	4,310.3
6	Annual debt service	Rp.mill/ Year	NA			217.5	1,129.6
7	Nett operating income (before interest & tax)	Rp mill	9,842.7	(105.6)	(581.0)	(0.8)	14.6
8	Historical value of tangi-ble assests	Rp mill	269,163.0	2,292.9	NA	3,358.6	4,650.8
9	Depreciated historical value of tangible assets	Rp mill	NA	3,487.1	418.3	5,916.8	5,503.9
10	Operating income (before depreciation)	Rp.mill/ Year	9,842,7	(105.6)	(581.0)	54.2	831.5
11	Annual labour cost	Rp.mill/ Year	6,025.5	602.6	642.6	623.3	1,025.7
12	Annual energy cost	Rp.mill/ Year		169.6	4.4	126.8	56.8
13	Revenue from annual water sales	Rp.mill/ Year	31,863.0	1,652.5	1,131.6	2.763.7	2,794.3
14	Year end accounts receivable	Rp mill		390.0	NA	NA	847.5
15	Revenue from annual domestic water sales	Rp.mill/ Year	24,197.1	1,205.6	1,102.2	1,312.0	2,424.1
16	Revenue from annual social water sales	Rp.mill/ Year	2,134.5	190.3	25.2	412.2	105.2
17	Revenue from annual commercial & industruial water sales	Rp.mill/ Year	5,530.9	359.3	4.2	1,039.5	265.0
18	Total Debt	Rp mill	68,540.0	543.1	0	1,628.0	3,149.2
19	Shareholder equity	Rp mill	69,163.0	1,551.2	NA	3,078.1	3,149.2

Table 2C - 05
Qualitative Data
West Sumatra Province

Description	West Sumatra			
	Solok (M)	Solok (D)	B.Tinggi (M)	T.Datar (D)
Corporate Plan (CP)				
* Already has CP	yes	yes	yes	yes
* Latest year of CP was perpared/up dated	2004	2001	2001	2004
* CP used as one of basic consideration for yearly programs?	yes	no	no	yes
PDAM Orientation to Customer				
* Ever been conducted Customer Survey Satisfaction	yes	no	no	yes
* Latest year to conduct CSS	2003	-	-	2003
* Any part of PDAM organization structure that responsible to handle/	no	no	yes	yes
handle complaint/information from customers/communities				
Training				
* Generally training attended by PDAM staffs, give benefits to PDAM	yes	yes	yes	yes
* PDAM staffs still need trainings	yes	yes	yes	yes
Inter-regional issue of PDAM				
* Any inter-regional/national issue that required to be discussed/solved	yes	yes	yes	yes
* If Any, write down	raw	tariff	raw	raw
	water		water	water
	tariff		tariff	tariff
	debt		debt	debt
Bench-marking				
* PDAM has been joining Bench-marking program	no	no	no	yes
* Reason does not join Bench-marking program	-	-	-	-
* PDAM get the benefits by joining BM program	-	-	-	yes
* BM useful for making yearly PDAM targets	-	-	-	yes
Water Quality monitoring				
* PDAM monitor water quality	no	no	no	no
* Reason does not monitor the water quality	-	-	-	-
* PDAM has appropiate equipments/tools for taking a water sample	no	no	no	no
* PDAM has appropiate facilities/laboratory equipments	no	no	no	no
GIS/MIS				
* PDAM has drawings 0f sping capture/intake/Water Treatment Plant	part of	part of	part of	yes
* Accuracy of distribution network drawings	?	?	?	30%
* PDAM has been using GIS since	not yet	not yet	not yet	not yet
Water Loss (NRW)				
* NRW level already urgent to be handle	yes	yes	yes	yes
* PDAM has yearly target to reduce NRW level	yes	yes	yes	yes
* PDAM conduct reducing NRW based on programmed	no	no	no	no
* Any part of PDAM org. structure responsible to reduce NRW	no	no	no	no
* PDAM staffs that handling water losses already has proper skill	no	no	no	no
* PDAM has proper equipment for reducing water lossactivies	no	no	no	no

Table 2C - 05
Qualitative Data
West Sumatra Province (cont.)

Description	West Sumatra			
	Solok (M)	Solok (D)	B.Tinggi (M)	T.Dátar (D)
Tariff				
* Latest year of tariff increase	2001	2001	2001	2001
* Current basic tariff (Rp./m3)	550	450	350	500
* PDAM need to evaluate present tariff in near future	yes	yes	yes	yes
* Connection installation fee (Rp.000)	750	550	1000	514
* Possible to pay in-installments for new connection fee	yes	yes	yes	no
Efficiency of Sub-System (IKK)				
* PDAM consider IKK as a problem for PDAM, especially from financial point of view	-	yes	-	yes
Meter Reading & Billing				
* Any problems of meter reading (either meter reader, effectiveness, efficiency and and accuracy)	yes	yes	yes	yes
* Meter reading conducting by PDAM or third parties	PDAM	PDAM	PDAM	PDAM
* Average number of meter read/day/meter reader	50	80	50	70
* Any routine audit of meter reading	not yet	not yet	not yet	not yet
* Any problems with billing (procedure, making bill & bill collection)	yes	yes	yes	yes
* PDAM already satisfied with billing collection performance	no	no	no	no
Energy Consumption & Pressure Management				
* Percentage of energy cost from total O&M cost (not incl.depreciation)	5%	0%	8%	2%
* PDAM consider energy cost as one of the biggest expenditure	yes	no	yes	yes
* Need to reduce energy consumption	yes	no	yes	yes
Production & Distribution cost				
* O&M maintenance has been doing effective and efficient	not yet	not yet	not yet	not yet
* Already have Standard Operation Procedure for O&M activities	not yet	not yet	not yet	part of
* Any installed equipment make less effective/efficiency of O&M	no	no	no	no
* Chemical dosing comply with raw water quality	no	no	no	yes
Acces urban poor to PDAM piped water				
* PDAM give priority to serve urban poor	yes	yes	yes	yes
* PDAM already give enough opportunity for urban poor to consume clean water from PDAM	yes	yes	yes	yes
Debit & Quality of water sources				
* Quantity of raw water sources is different during rain season and dry season	yes	yes	yes	yes
* Quantity of raw sources is less than previous years ago	yes	yes	yes	yes
* Quality of raw water is different during rain season and dry season	yes	yes	yes	yes
* Quality of raw water is less than previous years ago	yes	yes	yes	yes
Increasing Production capacity				
* Production capacity comply with design capacity	no	no	no	no
* PDAM need to increase production/distribution facilities	yes	yes	yes	yes

PDAM SOLOK MUNICIPALITY

The clean water system of PDAM Solok municipality has an initial capacity of 180 lps and the water sources are from 4 springs (Pincuran Gudang – 20 lps, Tabik Puyuh – 40 lps, Air Tabik – 20 lps and Guntung River – 40 lps) as well as one Water Treatment Plant (WTP) with a capacity of 40 lps.

The average water produced in 2004 was 81.6 lps, distributed 69.6 lps, and the average sold water was 52.5 lps. It means average water loss was 35.59 %.

It is estimated that there is a decreased of water capacity and at present, total capacity is 112.6 lps, from springs 72.6 lps and WTP 40 lps.

Only 32,664 people or 49% from the total population has been served in year 2004 by PDAM Solok or 60% of the service area (54, 480 people). The distribution is delivered through 5.618 connection units.

Because of the high cost of energy, the pumping of clean water from the water treatment plant is only carried out 10 hours/day, compared to the water distribution from the springs function for 24 hours/day.

The PDAM Solok municipality has a Corporate Plan through PERFORM Project-USAID.

The PDAM failed to have positive net income in the last three years. The average price of water per m3 is still below the cost of water per m3. From 2002-2004 the average price is ranging from Rp 798 to Rp 997, while the cost is ranging from Rp 1,300 to Rp 1,783. The result is the operating ratios in those periods are less than 1, meaning full cost recovery has not been attained. The liquidity is not sound as shown by current ratios of less than 1.

The present main problem of PDAM Solok municipality are:

- The existing base tariff of Rp. 450,-/m3, make difficult to achieve the full cost recovery.
- One of the reasons why the performance of the PDAM is not improved is due to the limitation of staffs capabilities that consist of 24% from Elementary School, 8% Junior-High, 60% from Senior-High and 8% Graduates. The number of PDAMs employees who have been trained so far is less than 10% of the existing employees.
- The level of water loss today reached 35.59% and there are 8.5 km of ACP pipe that categorized as leak sensitive.
- The use of pump from the treatment installation that is only being operated 10 hours/day due to energy cost. There is a need for a re-evaluation.
- The main source of water is located in Solok District area and management problems have begun to appear – for example the issue on raw water retribution.
- The PDAM realized the importance of water quality, but today the proper equipment as well as fund allocation to monitor the quality of water is not available.
- Today's service coverage has only achieved 49% of the total population of Solok municipality.

PDAM SOLOK DISTRICT

The PDAM Solok district managed 11 service units area that consist of:

- Main unit, Kota Baru Selayo, using 3 springs with installed capacity of 25 lps and production capacity of 13,5 lps.
- 10 IKK units using 10 springs and 6 water treatment plants, with total installed and production capacities as shown in table below:

No	Service Unit Area	Installed capacity (l/s)				Production Capacity (l/s)
		Spring		WTP	Total	
		unit	l/s			
1	Alahan Panjang	2	12.5	10	22.5	4
2	Talang Cupak	1	15		15	8
3	Muara Panas	1	20		20	16
4	Pasir Talang	1	22.5		22.5	7.5
5	Koto Sani	2	12.5	5	12.5	10.8
6	Bukit Sileh	1	2.5	5	7.5	.9
7	Sulit Air			10	10	1.0
8	Surian			10	10	1.2
9	Kayu Aro	2	20		20	4.2
10	Sirukam			5	5	Trial
	Total	10	105	45	150	53.6

The aboved water sources data are rather doubtful, therefore field assessment are necessary.

Population served through 1.446 connections at Kota Baru Selayo is 11.378 people or 65% from the service area and 55% from the population of the administrative area (20.735 people).

The number of served population through 5.236 connections at other service units is 40.370 people or 40% from the service area (101.315 people) and 13% from the administrative area population (313.090 people).

For the main unit at Kota Baru Selayo, average water distributed in 2004 was 34.819 lps, and sold water was 28.423 lps and the average water loss was 20%.

For total of the other units, distributed water in 2004 was 135.936 m3, sold water was 93.705 m3 and average water loss was 31%.

A master meter has not yet been installed at all of the clean water systems, so the amount of distributed water and water loss are derived by estimating.

The PDAM failed to have positive net income in the last three years. The average price of water per m3 is still below the cost of water per m3. From 2002-2004 the average price is ranging from Rp 700 to Rp 922, while the cost is ranging from Rp 1,100 to Rp 1,500. The result is the operating ratios in those periods are less than 1, meaning full cost recovery has not been attained. The current ratios are good (more than 1) for year 2002 and 2003.

The main problems of PDAM Kab. Solok today are:

- PDAM Solok District has no Corporate Planning, so there is no clear vision of the PDAM as yet.
- The existing tariff is not adequate to achieve full cost recovery. Today's base tariff is Rp. 450,-/m3 and by the end of 2004 it still suffered of Rp. 580 million lost.
- The PDAM staffs capability need to be improved to increase the performance. From all of the employees. Only less than 10% of the staff has been trained.
- There were no master meters installed and the number of water produced and loss are only estimation.
- With the capacity of existing sources of water and service coverage, there is still 37% excess for potential services.
- Due to the scattered of locations of the system that are far from each others, an integrated meter reading and billing system are required, so the work can be done efficiently and accurately.
- There is no equipment to monitor the quality of water at the PDAM.

PDAM BUKIT TINGGI MUNICIPALITY

Through 9,518 connections, by the year of 2004, 6,100 people of Bukit Tinggi municipality have received water service from PDAM Bukit Tinggi. Population served is 51% from the total population of the city (98.511 people) or 57% from the number of population of the service area of PDAM Bukit Tinggi (88, 670 people).

Based on data from PDAM Bukit Tinggi, the capacity of the system is 219 lps, and use raw water from 2 springs (145 lps from Tanang river and 6 lps from the spring of Cingkariang river), 3 deep wells (3 lps from Birugo, 10 lps from Tabek gadang and 10 lps from Palolok) as well as 40 lps from WTP Belakang Balok.

The average water produced in 2004 was 151 lps, while the distributed water was 137 lps, and the average sold water was 108 lps. Average water loss was 28% and the idle capacity was 68 lps.

There is no master meters installed at these water systems, so the volume of water produced is based on estimated for which the validity is doubtful. This is also supported by evidence that the clean water service in Bukit Tinggi municipality is less than 12 hours/day average.

The PDAM failed to have positive net income in the last three years, but is improving as shown with a negative net income of only Rp 0.767 million in 2004. The average price of water per m3 is still below the cost of water per m3. From 2002-2004 the average price is ranging from Rp 780 to Rp 800, while the cost is ranging from Rp 950 to Rp 1,100. The operating ratios in those periods are good, above 1, in 2003 and 2004 meaning full cost recovery has been attained. It looks contracdictory with the average price that are lower

than cost. The reason most likely is revenue from connection fee is contributing much to PDAM operating revenue. The current ratio is good (more than 1) for each year.

The main problems of PDAM Kota Bukti Tinggi are:

- PDAM Kota Bukit Tinggi has no Corporate Planning, so there is no clear vision.
- The capability of the PDAM staffs at present is limited and therefore their performances are difficult to be increased. From the total number of PDAMs employees, only less than 10% have been trained.
- The water service as for today is less than 12 hours/day and there are still many pipe we re inherited from the Dutch era.
- There are no master meters installed so far and the figure of water loss is estimated. It mesn "idle capacity" is doubtful.
- Many of water sources located outside of Bukit Tinggi city, and it could be a problem in the future in such as protection of water sources as well as utilization of the water sources.
- The energy cost each year is sharply increased, more than 50%.
- There is not yet conducted customers satisfaction survey, so the real opinion of the customers about the PDAMs performance is not known.
- The service coverage achieved is only 62% and the water distribution less than 12 hours/day.

PDAM TANAH DATAR DISTRICT

The PDAM Tanah Datar District manage 11 service units area that consists of:

- Main unit Batu Sangkar, with 141 lps installed capacity and 61 lps production capacity.
- 10 IKK units with a total installed capacity of 162 lps and 42 lps production capacity, That consist of:
  - unit Sengayang - 15 lps
  - unit PD Ganting - 6 lps
  - Unit Simawang - 9 lps
  - Uni Malalo - 12.5 lps
  - Unit Rambatan - 10 lps
  - Unit Lintau Buo - 45 lps
  - Unit Lima Kaum - 22.5 lps
  - Unit Jaho - 20 lps
  - Unit KT Hiling - 7.5 lps
  - Unit Salimpuang - 15 lps

All water come from springs and distribute by gravity with 24 hours/day.

The number of served population through 5,798 connections at the main unit of Batu Sangkar is 29,440 people or equal to 92,5% from the service area (31,791 people) and 81,4% from the administrative area population (36,183 people).

Through 11,966 connections, others service units area was served 63,230 people or equal to 76,8% from the service area (82,235 people) and 23,7% from the administrative area population (266.627 people).

The average distributed water of unit Batu Sangkar in 2004 was 26.5 lps, since average water sold was 20.6 lps. It means average water loss was 22.3%.

Atother service units area, the total average of distributed water in 2004 was 45.5 lps, and the sold water average was 35.2 lps with water loss of 23%.

There is no master meter installed at all clean water systems, and the figure distributed water and the water loss were estimated.

PDAM Tanah Datar already has a Corporate Plan through PERFORM Project-USAID and join Benchmarking program from Indonesian PDAMs Association (PERPAMSI) as well.

The PDAM are able to earn positive net income, although small, in year 2004 at Rp 14 million. The average price of water per m3 is still below the cost of water per m3. From 2002-2004 the average price is ranging from Rp 1,140 to Rp 1,590, while the cost is ranging from Rp 1,400 to Rp 1,800. The operating ratios in those periods are good, above 1, in 2003 and 2004 meaning full cost recovery has been attained. It looks contracdictory with the average price that are lower than cost. The reason most likely is revenue from connection fee is contributing much to PDAM operating revenue. The current ratio is good (more than 1) for each year.

Today's main problems of PDAM Kab. Tanah Datar are:

- They need a system that technical and financial data be a the same system and relate to each others in order to achieve works efficiency and to speed up administrative process.
- The need to improve the PDAM employees capabilities through trainings.
- The operational and maintenance of IKK units are generally high cost, so there is a need to be more efficient.
- Master meters are not yet installed, so the level of water loss calculation is by estimated. Therefore need activities regarding NRW control such as the study of NRW, master meters installment, etc.

PDAM PADANG MUNICIPALITY

Coverage area of PDAM Padang, at the end of 2004, is 477,9 Ha or 72% of administrative area through 52,279 customer connections or 62% of total population at administrative area

PDAM Padang Municipality has 1,213 l/s installed production capacity, consists of 8 units of water treatment plant - 970 l/s, and 12 units of deep well - 243 l/s. Two units of deep well with 45 l/s capacity each, can not be operated due to the ground water level is drop, ie deep well at kelurahan Koto Panjang and at Kelurahan Cengkeh. PDAM Padang municipality distribute the water to customers is 24 hours/day

Average water produced/distributed in the year 2004 was 784 lps, and average water sold was 504 lps, with the app. water loss in 2004 was 34.3%.

New connection fee is Rp 800,000 and base water tariff is Rp 560/m3 and average tariff in year 2004 was Rp. 1,931per m3, since operating cost was Rp 2,152/m3. In year 2004, PDAM Padang has profit Rp.2.12 billion.

In year 2004 PDAM Padang has 299 employees.

Currently the problems faced by PDAM Padang are :

- Existing base tariff is only Rp 800,-/m3, and it is too low that. It could be seen from average tariff was Rp 1,931/m3 since average operating cost was Rp 2,152/m3
- Level of Non revenue Water is still high, 34.3%
- Limitation of professional human resources, only 31 of 299 employees has S1 or S2 education background.
- Raw water is limited, in terms of quantity and quality
- During previous 5 years (2000-2004) PDAM had loss Rp 11.13 Billion, and only year 2004 PDAM got profit Rp 2.12 billion.
- Debt of PDAM was 79.21 billion. Accumulation of debt due to the until year 2003 still has no profit and every year PDAM only paid part of debt that has to be paid by PDAM.
- Generally the age of transmission and distribution pipe is already old and pipe condition is corrosive

APPENDIX II-D

PDAM ASSESSMENT– NORTH SUMATRA PROVINCE

The initial plan was to assess 5 PDAMs of North Sumatra Province, PDAM Medan, Karo district, Langkat district, Binjai municipality and Deli Serdang, however, only 3 PDAMs were assessed, PDAM Karo district, Langkat district and Binjai municipality. The PDAM Deli Serdang is managed by PDAM Medan, while PDAM Medan has been selected based on the PDAM financial condition as considered as "Tier I" category. Nevertheless the data collecting was conducted at PDAM Medan.

The data recapitulation of the assessment result for PDAMs in West Sumatra Province can be seen in tables 2D-01 to 2D-05, while the assessment report of each PDAM can be read from descriptions of each PDAM.

Table 2D-01. Water Source, Production, Distribution, Sold Water and Water Loss, North Sumatra Province - Year 2004.

No	Description	PDAM				
		Karo	Langkat	Binjai	Tirtanadi -Medan	
		District	District	Municipality	Medan Area	KSO Area
1	Number of Service Area					
	* Main Area	1	1	1	1	-
	* Sub Area (IKK)	9	13	-	-	9
2	No of Water Prod. Sources					
	* spring	23	1	0	1	6
	* river	-	8	1	4	3
	* deep well	-	25	2	4	1
	* others	-	-	-	-	3
	Total	23	34	3	9	13
3	Water Source Capacity (l/s)					
	* spring	313	5.0	-	600	368
	* river	-	232.5	200	3,500	174
	* deep well	-	97.0	10	75	62
	* other	-	-	-	-	65
	Total	313	334.5	210	4,175	669
4	Average Production (l/s)				4,263	555
5	Ave. Distribution (l/s)	191	191.0	107.0	4,167	555
6	Ave. Water Sold (l/s)	85.0	96.4	77.6	3,284	402
7	Water Loss (%)	55.8	49.5	27.5	21.2	27.6

Table 2D - 02. Population, Served, No of Connection and no of PDAM Employee, North Sumatra Province - Year 2004

No	Description	PDAM				
		Karo District	Langkat District	Binjai Municipality	Tirtanadi –Medan	
					Medan Area	KSO Area
1	Population					
	* Total	-	-	-	2,003,328	2,256,353
	* Served Area	-	-	-	2,003,328	2,256,353
	* Served	-	-	-	1,858,458	418,086
2	%tage served, from					
	* total population	-	-	-	92.8	18,5
	* served area	-	-	-	92.8	18,5
3	No of connection	14.137	14.920	9.379	294,821	40,518
4	Hour/day served	-	-	-	24	24
5	No of employee	96	176	-	950	219

Table 2D - 03. Base Tariff, Average Tariff and Connection fee, Nort Sumatra Province Year 2004

No	Description	PDAM				
		Karo District	Langkat District	Binjai Municipality	Tirtanadi –Medan	
					Medan Area	KSO Area
1	Base Tariff (Rp/m3)	700	740	595	335	Various
2	Average Tariff (Rp/m3)					
	* Year 2004	1,278..0	1,591.0	-	1560	
	* Year 2003	615.5	-	-	1534	
3	Connection fee (Rp)	767,420	420,000	750,000	1,000,000	various

Table 2D - 04. Financial Data (Rp. Mill), North Sumatra Province – Year 2004

No	Description	PDAM				
		Unit	Karo District	Langkat District	Binjai m.cipality	Medan
1	Annual operation expenses (not include depreciation & interest)	Rp.mill/ year	3,604.2	4,201.0	4,423.1	164,841.3
2	Annual Operating revenue	Rp.mill/ year	13,839.4	4,665.6	4,071.0	200,850.9
3	Annual operating cost (include depreciation & interest)	Rp.mill/ year	4,817.0	7,4665.6	8,147.7	192,304.6
4	Current assest	Rp mill	1,156.0	2,091.0	869.6	29,555.8
5	Current liabilities	Rp mill	6,030.6	8,985.3	13,111.9	50,594.7
6	Annual debt service	Rp.mill/ year	261.3	0	0	17,549.3
7	Nett operating income (before interest & tax)	Rp mill	(148.9)	(2,734.0)	(4,076.2)	7,929.2
8	Historical value of tangible assests	Rp mill	2,687.3	9,675.8	9,647.8	151,252.0
9	Depreciated historical value of tangible assets	Rp mill	4,369.9	15,067.3	(11,501.6)	245,448.4
10	Operating income (before depreciation)	Rp.mill/ year	(593.5)	0	(52.2)	25,657.7
11	Annual labour cost	Rp.mill/ year	1,398.8	1,628.0	1,319.4	54,744,0
12	Annual energy cost	Rp.mill/ year	906.5	0	0	30,280.3
13	Revenue from annual water sales	Rp.mill/ year	2,804.7	4,498.9	3,786.4	179,487.3
14	Year end accounts receivable	Rp mill	1,982.9	0	784.2	13.004,6
15	Revenue from annual domestic water sales	Rp.mill/ year	1,706.7	3,886.8	-	133.645,1
16	Revenue from annual social water sales	Rp.mill/ year	506.2	41.6	-	3.009,0
17	Revenue from annual commercial & industruial water sales	Rp.mill/ year	591.9	825.9	-	42.883,3
18	Total Debt	Rp mill	4,832.8	18,615.1	16,439.8	42,370.0
19	Shareholder equity	Rp mill	(1,031.1)	14,52.5	(18,439.4)	92.980,6

Table 2D - 05
Qualitative Data
North Sumatra Province

Description	North Sumatra			
	Karo (D)	Langkat (D)	Binjai (M)	Medan (M)
Corporate Plan (CP)				
* Already has CP	yes	yes	not yet	yes
* Latest year of CP was perpared/up dated	2000	2000	-	2004
* CP used as one of basic consideration for yearly programs?	no	no	-	part of
PDAM Orientation to Customer				
* Ever been conducted Customer Survey Satisfaction	not yet	not yet	not yet	yes
* Latest year to conduct CSS	-	-	-	2003
* Any part of PDAM organization structure that responsible to handle/	yes	yes	yes	yes
handle complaint/information from customers/communities				
Training				
* Generally training attended by PDAM staffs, give benefits to PDAM	yes	yes	yes	yes
* PDAM staffs still need trainings	yes	yes	yes	yes
Inter-regional issue of PDAM				
* Any inter-regional/national issue that required to be discussed/solved	yes	yes	no	yes
* If Any, write down	raw	raw	-	raw
	water	water		water
	IKK	IKK		
		tariff		
Bench-marking				
* PDAM has been joining Bench-marking program	not yet	not yet	not yet	yes
* Reason does not join Bench-marking program	budget	budget	budget	
	limitation	limitation	limitation	
* PDAM get the benefits by joining BM program	-	-	-	yes
* BM useful for making yearly PDAM targets	-	-	-	yes
Water Quality monitoring				
* PDAM monitor water quality	not yet	not yet	limited	yes
* Reason does not monitor the water quality	budget	budget	-	
		limitation		
* PDAM has appropiate equipments/tools for taking a water sample	no	no	limited	yes
* PDAM has appropiate facilities/laboratory equipments	no	no	limited	yes
GIS/MIS				
* PDAM has drawings 0f sping capture/intake/Water Treatment Plant	yes	yes	yes	yes
* Accuracy of distribution network drawings	70%	50%	not compl	80%
* PDAM has been using GIS since	not yet	not yet	not yet	2000
Water Loss (IRW)				
* NRW level already urgent to be handle	yes	yes	yes	yes
* PDAM has yearly target to reduce NRW level	yes	yes	yes	yes
* PDAM conduct reducing NRW based on programmed	yes	yes	yes	no
* Any part of PDAM org. structure responsible to reduce NRW	no	no	no	no
* PDAM staffs that handling water losses already has proper skill	no	no	no	no
* PDAM has proper equipment for reducing water lossactivies	no	no	no	yes

Table 2D - 05
Qualitative Data
North Sumatra Province (Cont.)

Description	North Sumatra			
	Karo (D)	Langkat (D)	Binjai (M)	Medan (M)
Tariff				
* Latest year of tariff increase	2003	2002	2003	2003
* Current basic tariff (Rp./m3)	700	740	595	335
* PDAM need to evaluate present tariff in near future	yes	yes	yes	yes
* Connection installation fee (Rp.000)	767.4	420	750	1000
* Possible to pay in-installments for new connection fee	no	no	yes	no
Efficiency of Sub-System (IKK)				
* PDAM consider IKK as a problem for PDAM, especially from financial point of view	yes	yes	-	
Meter Reading & Billing				
* Any problems of meter reading (either meter reader, effectiveness, efficiency and	yes	yes	yes	yes
and accuracy)				
* Meter reading conducting by PDAM or third parties	PDAM	PDAM	PDAM	PDAM
* Average number of meter read/day/meter reader	133	100	100	100
* Any routine audit of meter reading	not yet	not yet	not yet	not yet
* Any problems with billing (procedure, making bill & bill collection)	yes	yes	yes	yes
* PDAM already satisfied with billing collection performance	no	no	no	no
Energy Consumption & Pressure Management				
* Percentage of energy cost from total O&M cost (not incl.depreciation)	25%	40%	?	16%
* PDAM consider energy cost as one of the biggest expenditure	yes	yes	yes	yes
* Need to reduce energy consumption	yes	yes	yes	yes
Production & Distribution cost				
* O&M maintenance has been doing effective and efficient	not yet	not yet	not yet	yes
* Already have Standard Operation Procedure for O&M activities	part of	part of	not yet	yes
* Any installed equipment make less effective/efficiency of O&M	yes	yes	no	yes
* Chemical dosing comply with raw water quality	?	?	yes	yes
Acces urban poor to PDAM piped water				
* PDAM give priority to serve urban poor	no	no	yes	no
* PDAM already give enough opportunity for urban poor to consume	already	already	already	yes
clean water from PDAM				
Debit & Quality of water sources				
* Quantity of raw water sources is different during rain season and dry season	10%	20%	yes	yes
* Quantity of raw sources is less than previous years ago	10%	20%	yes	yes
* Quality of raw water is different during rain season and dry season	yes	yes	yes	no
* Quality of raw water is less than previous years ago	no	no	no	no
Increasing Production capacity				
* Production capacity comply with design capacity	85%	80%	75%	yes
* PDAM need to increase production/distribution facilities	yes	yes	yes	yes

PDAM TIRTA MALEM – KARO DISTRICT

Kabupaten Karo consists of 13 sub-districts, 248 villages and 10 Kelurahans. The sub-districts of Kabupaten Karo are: Kabanjahe, Brastagi, Tigapanah, Merek, Barusjahe, Simpang Empat, Payung, Kutabuluh, Munte, Juhar, Tigabinanga, Laubaleng and that of Mardinding.

The number of Kabupaten Karo's population until the end of 2003 is 311.012 people, while in 2004 it was estimated 322.500 people. The service coverage of PDAM Tirta Malem until December 2004 has not yet achieve 30% from the total population.

All water sources use by PDAM TIrta Malem are from the springs. There are about 25 spring that have been using by PDAM Tirta Malem starting from 1 to 60 lps, with total installed capacity of 313 lps. Quality of raw water is good and no need special treatment.

The service coverage of PDAM Tirta Malem include Kabanjahe and 9 IKK, as for the service system units can be seen in table 1.1 below. The water supply system that served Brastagi area is managed by PDAM Tirtanadi's - Medan.
The number of customer connections of PDAM Tirta Malem at the end of 2004 is 14.137 that consist of 8.531 connections at Kabanjahe and 5.606 connections at other IKKs, as can be seen in table 1.2.

Table 1.1. Service Area of PDAM Tirta Malem

No.	Location	Distribution system	Connection (units)
1.	Kabanjahe	Pumping & Gravitation	8.531
2.	IKK Barus Jahe	Gravitation	690
3.	IKK Tiga Binanga	Gravitation	1.427
4.	IKK Tiga Panah	Gravitation	1.207
5.	IKK Lau Baleng	Gravitation	149
6.	IKK Simpang Empat	Gravitation	330
7.	IKK Kuta Buluh	Gravitation	258
8.	IKK Juhar	Gravitation	734
9.	IKK Munthe	Gravitation	367
10.	IKK Payung	Gravitation	444
	Total		**14.137**

Source : PDAM Tirta Malem

Table 1. 2. No of connection PDAM Tirta Malem

No.	Type of Connection	Number of Connection (unit)
1.	House connection	12.421
2.	Social (general)	47
3.	Social (special)	109
4.	Goverment Institution	194
5.	Small comercial	1042
6.	Large comercial	320
7.	Small industry	4
	Total	**14.137**

Source : PDAM Tirta Malem

Until December 2004 the water produced and distributed by PDAM Kab. Karo was 6.038.818 m3/year or 503.235 m3/month or 191 lps, and sold water was 2.676.974 m3/year or 223.081 m3/month ot 85 lps. The water loss of PDAM Kab. Karo was 55,67%.

Due to the slope nature from the sources to the service areas, water distribution system in all IKK at Karo District use gravity system, except at Kabanjahe. Elevation of service area at Kabanjahe is relatively higher than elevation of the water source and to flow the water use pumping and gravity system. Energy consumption and cost of pump is very high, due to the water volume distributed by pump at Kabanjahe is more than half of total volume of water distributed by PDAM Karo, and pumping head achieved 90 m.

The quality and quality of ground water in the service area mainly at Kabanjahe is not good, and it is an opportunity for PDAM Tirta Malem to increase their number of customers.

The existing organizational structure of PDAM Tirta Malem of Kabupaten Karo is determined by the Local Government decree of Karo District No. 061/320 Year 1995 on Organizational Structure of PDAM Tirta Malem, consist of:

- 3 (three) Directors: President Director, Director of General Affairs and that of Technical.
- 1 (one) Head of Internal Supervisory Unit.
- 6 (six) Section Heads (Financial, Customer, General, Production, Distribution and Technical Planning).
- 11 (eleven) Sub-Section Heads (3 persons under Financial Section Head, 2 under Customer Section Head, 2 under General Section Head, 3 under Distribution Section Head and 1 under Technical Planning Section Head).
- 9 (nine) IKK Heads

The number of employee work at PDAM Tirta Malem at 31 December 2004 is 112 persons, consist of:

- From Local Gov. : 1 person
- Officials of PDAM : 95 persons.
- Temporary Staffs : 16 persons

As for the main findings of this assessment are:

- The service coverage of PDAM Tirta Malem in Karo District in 2004 is under 30% from the 322,500 people of total population in 2004.
- The water source installed capacity is 313 lps while the produced water capacity is only 191 lps so there is an idle capacity of about 120 lps.
- The average water consumption per connection was 15,8 m3/unit/month.
- The present figure of capacity need to be further studied because it is only an estimation from the technical division, due to the several production meters is not working, and some production facilities are not installed production meters.
- Lack of distribution network data including the blueprint drawing of the system.
- The amount of energy consumption is high enough, about 20% from total cost per year. Although pumping system is only used at Kabanjahe, but it's capacity is more than half of the total capacity of PDAM Tirta malam and head of pump is 90 m.
- The amount of IKK system, i.e. 9 units with a number of connections from 149 to 1.400 units is rather a heavy burden for PDAM Tirta Malem.
- The water loss at the system is big enough, i.e. 56%.
- The billing and reporting system are still done manually, often they are not efficient nor effective.
- The average number of employees for each customer is 8 employees/1000 customers.
- The amount of long-term debt is Rp. 4,8 Billons.
- The operating ratio is about 82%.
- The existing Corporate Plan has been expired this year, i.e. from 2001 – 2005, but its implementation for the most part did not happen as yet.
- The human resources at PDAM Tirta Malem are very limited as well as very rare to have opportunity to get training.

The recommendations for PDAM Tirta Malem – Karo District are:

- PDAM Tirta Malem could still increase its service coverage by utilizing the idle capacity that is still big enough, i.e. about 120 lps.
- The average clean water consumption, mainly at Kabanjahe, can still be increased through socialization of the importance of using clean water.
- To utilize the idle capacity and decrease the selling cost per unit, the PDAM is recommended to increase the number of connections
- By utilizing 50% of the idle capacity, increasing the average water consumption, decreasing water loss even by 10% as well as enlarging the service coverage into 30% from the total population, the number of connections could be increased about 9000 customers in 5 years. Nevertheless these need hard work, because historically from 2001 until 2004 the additional average connections were only 500 per year.
- PDAM Tirta Malem has one city system and nine IKKs that are located far from each other and therefore need a better system arrangement. The arrangement involved the production system, distribution network to increase the performance of streaming system, master meter utilization as well as the use of electrical energy that until now has not function optimally. The partial use of master meter causing also invalid water consumption and water loss recording.

- The organization of administrative and financial systems is badly, as well as the billing recording is done manually, so there is big possibility of faulty registration and most hampering in the service activities to the people. Therefore program to improve the administrative and financial system using *computer* become very urgent to be done.
- The level of water loss (NRW) at present that achieved 50% need a very serious attention. Through billing and financial system improvement mentioned above, as well as the improvement of overall production and network system, the water loss can be decreased effectively. The cause of NRW has not been studied in detail but we believe that besides the administrative aspect, technically is big part of water loss and it is also caused by the malfunctioning of water meters. By using a better management system, the water supply level, service coverage and the revenue will also be increased as well as cost down.
- The validity of the existing Corporate Plan has been expired and not being fully implemented due to some reasons. Therefore the Corporate Plan for the year 2006 – 2010 need to be programmed and also socialized towards all stakeholders.
- The increasing of PDAM Tirta Malem's human resources is also need to be programmed, covering the operational, administrative, financial, and motivation, because in all of these aspects, PDAM has problems.

TIRTA WAMPU – LANGKAT DISTRICT

Kabupaten Langkat has a size area of 626.329 km2, consist of 20 sub-districts, 221 villages and 14 Kelurahans. The sub-districts are: Bahorok, Salapian, Sei Bingei, Kuala, Selesai, Binjai, Stabat, Wampu, Batang Serangan, Sawit Seberang, Padang Tualang, Hinai, Secanggang, Tanjung Pura, Gebang, Babalan, Sei Lepan, Brandan Barat, Besitang and Pangkalan Susu.

The number of population of Kabupaten Langkat at the end of 2003 was 944.580 people, while in 2004 it was estimated has reached 950.826. The service coverage of PDAM Tirta Wampu at the end of December 2004 is about 10% from the total population.

PDAM Tirta Wampu has 34 installed water production consist of: 1 spring, 3 deep wells, 22 arthesis well and 8 locations of rivers, with total installed capacity is about 335 lps, as can be seen in table 2.1.

From 14 service area units Langkat District, 13 units use pumping system and only 1 unit (Unit Rumah Galuh) from spring with capacity 5 l/s using gravitation flow. Most system services areas that relatively flat.

In December 2004, the clean water produced by PDAM Tirta Wampu Kabupaten Langkat was 6.972.739 m3/year or 581.062 m3/month or 221 lps, while the distributed water was 6.033.352 or 502.779 m3/month or 191 lps. The sold water was 3.048.935 m3/year or 96,42 lps. So the water loss of PDAM Tirta Wampu Kabupaten Langkat was 2004 is 49,47%.

The number of customer connections at PDAM Tirta Wampu was 14.920 as shown in table 2.3. The quantity and quality of ground water condition in most of the service area is not good, and it is a market opportunity for PDAM Tirta Wampu to increase their number of customers.

The existing organizational structure of PDAM Tirta Wampu Kabupaten Langkat is determined by a decree of Local Government of Langkat District No. 29 Year 2003 on the Organization Structure of PDAM Tirta Wampu Kabupaten Langkat dated October 15 2003, that consist of:

- 1 (one) Director
- 1 (one) Internal Supervisory Unit Head
- 3 (three) Department Heads (Administration and Finance, Customer Relations and Technical).
- 10 (ten) Section Heads (4 persons under Administration and Finance Head, 4 under Customer Relations Head and 4 persons under the Technical Head).
- 13 (third teen) Unit Heads

The number of employee work for PDAM Tirta Wampu at 31 December 2004 are 112 persons, consist of:

- Employee of Pemda Kab. Langkat : 1 person
- Employees of PDAM : 150 persons
- Temporary Staffs : 28 persons

Table 2.1. Installed Capacity of PDAM Tirta Wampu

No	Instalation	Installed capacity (lps)	Served Unit	Note
1.	WTP Pelawi I	80	1. Pangkalan	Not well function
2.	WTP Pelawi II	20	Brandan	
3.	Deep well Teluk Meku	5		
4.	Deep well Kampung Baru	2,5		
5.	Arthesis well Sei Bilah	2		
6.	WTP Pantai Gemi	70	2. Stabat	Not well function
7.	Deep well RSS Kelapa Sawit	5		
8.	Deep well Jl Agus Salim	5		
9.	Deep well Pangkalan Susu	5	3. Pangkalan Susu	
10.	Deep well Jl Taman Bahagia	5		
11.	Deep well Jl Swadaya	5		
12.	Deep well Kampung Dalam	5		
13.	Deep well Bukit Rata	5		
14.	WTP Jl Langkat	40	4. Tanjung Pura	Not well function
15.	Deep well Ds Teluk Bakung	3,5		
16.	Deep well Desa Pantai Cermin	5		
17.	Deep well Jl Langkat	2,5		
18.	Arthesis well Ktr Unit Tj Pura	2		
19.	Deep well Jl Sudirman	2		
20.	Deep well Ds Air Tawar	5	5. Gebang	
21.	Deep well Ds Air Hitam	5		
22.	Deep well Batu Malenggang I	2,5	6. Tanjung	
23.	Deep well Batu Malenggang II	5	Beringin	
24.	Deep well Tanjung Selamat	5	7. Tanjung	
25.	Arthesis well Ds Tanjung Putus	2	Selamat	

26.	WTP Bahorok	10	8. Bahorok	Not well function
27.	WTP Tanjung Langkat	5	9. Tanjung Langkat	Not well function
28.	WTP deep wellBukit Kubu	1,5	10. Besitang	
29.	WTP deep well Bukit Mas	1,5		
30.	WTP Kuala I	2,5	11. Kuala	Not function
31.	WTP Kuala II	5		Not function
32.	Spring Desa Telagah	5	12. Rumah Galuh	
33.	Deep well Ds Hinai Kiri I	5	13. Secanggang	
34.	WTP deep wellBor Ds Hinai Kiri II	5	14. Selesai	Treated water is no so good
	Total	**334,5**		

Source : PDAM Tirta Wampu Kabupaten Langkat

Table 2.2. Service Area - PDAM Tirta Wampu

No.	Unit	Flow System	No of Connection (unit)
1.	Pangkalan Brandan	Pumping	5.853
2.	Stabat	Pumping	2.435
3.	Pangkalan Susu	Pumping	1.643
4.	Tanjung Pura	Pumping	1.620
5.	Gebang	Pumping	518
6.	Tanjung Beringin	Pumping	522
7.	Tanjung Selamat	Pumping	397
8.	Bahorok	Pumping	369
9.	Tanjung Langkat	Pumping	363
10.	Besitang	Pumping	299
11.	Kuala	Pumping	296
12.	Rumah Galuh	Gravity	268
13.	Secanggang	Pumping	251
14.	Selesai	Pumping	86
	Total		**14.920**

Source : PDAM Tirta Wampu Kabupaten Langkat

Table 2.3. No of Connection - PDAM Tirta Wampu

No.	Connection type	Unit
1.	Houese connection	13.257
2.	Social (general)	63
3.	Social (special)	138
4.	Goverment	170
5.	Small comercial	1.233
6.	Large commercial	14
7.	Small industry	15
8.	Large industry	2
9.	Army/police	28
	Total	**14.920**

Source : PDAM Tirta WampuKabupaten Langka

As for main findings from the assessment are:

- The service coverage of PDAM Tirta Wampu in Kabupaten Langkat in 2004 is about 10% from the total population of 950.826 people.
- The installed water sources capacity is 335 lps, while the produced water capacity was 221 lps so the idle capacity was about 114 lps.
- The average of water consumption per connection was 17,03/unit/month.
- Almost all water treatment installations need to be repaired, due to the limitation of maintenance cost of the PDAM.
- The level of services to customers in terms of quality, quantity, continuity and pressure is very minimum, and yet the additional customers opportunity is very high.
- The existing figure of capacities need to be studied further, because is only estimation figure by technical department due to not functioning of master meters or due to no water meter installed at production facilities.
- The distribution network data is very limited including as built drawing of the system.
- The energy consumption at intake facilities is high enough because all system use the pumping system except 1 unit at Rumah Galuh by gravitational system, but its capacity is very small, i.e. not reach 1% of the total system capacity.
- Many of the service units that are scattered, except the units of Pangkalan Brandan, Pangkalan Susu, Tanjung Pura and Stabat, 10 other service units with 80 to 520 connections is burdening enough for PDAM Tirta Wampu because in terms of system is scarce indeed.
- The water loss of the system is high enough, i.e. 50%.
- The billing system has been computerized but need to be developed because it has not been integrated with the financial system. As for the reporting, it has also been computerized although with very limited condition.
- The number of employee for each 1000 customer is 12 employees/1000.
- The financial is *the weakest aspect at PDAM, the amount of long-terms debt has reached Rp 18,6 Billions with no ability to pay*. The Regent has asked support from PDAM Tirtanadi to cooperate, but has not been realized to this day due to varied reasons.
- Operating ratio of about 62%.
- The existing Corporate Plan has been expired this year, i.e. from 2001 – 2005, nevertheless for the most part of it are not implemented.
- The human resource of PDAM Tirta Wampu is very limited and the opportunity to follow training is very scarce.

To be recommended:

- PDAM Tirta Wampu could increase its service coverage though utilizing the idle capacity that still big enough, i.e. about 114 lps.
- The average of clean water consumption mainly at 4 biggest units as Stabat, Pangkalan Brandan, Pangkalan Susu and Tanjung Pura could be increased but need sufficient support from the PDAM as well in terms of production and network system readiness. Due to the bad ground water in Kabupaten Langkat's area, the market opportunity is very high, so even with minimum services to the customers, they will still eager to pay.

- To utilize the idle capacity that has not been used and reduce the selling cost per unit, it is recommended that the PDAM make a program of additional number of connections.
- Through the optimalization program, i.e. utilizing the idle capacity, increasing average water consumption, reducing water loss into 30% as well as enlarging the service coverage to become 13% from the total population, the number of connection could be added about 11.800 customers in 5 years. But to achieve it, PDAM has to work hard because historically from the year 2002 until 2004 the average added connections were only 200 per year.
- PDAM Tirta Wampu has 14 service area units which are located far away from one to each other, need a better system arrangement. The improved system both at production and distribution network as well is to increase performance of the streaming system, master meter functioning and also the electrical energy that has not been optimally used. The insufficient used of master meters and even still many customers who does not use water meter are also caused invalid water consumption and water loss registration.
- The administrative and financial system arrangement is badly need also because the billing recording of consumed water, although has employed computer system but still very limited at the Stabat office, while in the other office units are still manual so the possibility of error in recording is very high and hampering the service activity towards customers. Therefore the improvement of the administrative and financial by using computer is urgent.
- The present level of water loss (NRW) that achieved 50% need a serious attention. Through the billing and financial arrangement mentioned above as well as the production and overall network system, the water loss could be reduced effectively. The cause of NRW has not been studied in detail but we believe that beside the administrative aspect, technically speaking most of the water loss are caused by broken (*about 3.300 customers have their water meters broken or lost*) and inefficient used of water meters. Through a better system arrangement, the water supplied, service coverage and also the revenue of PDAM will be increased as well as cost down.
- The validity of the existing Corporate Plan has been expired while mostly have not been implemented due to several reasons. Therefore a Corporate Plan for the year 2006 – 2010 need to be programmed as well as informed to all stakeholders. A strong support from the government, especially that from the Kabupaten as well as from the province and central government are needed, because the present management condition *mainly the financial matters face a very serious problem.*
- The human resources development at PDAM Tirta Wampu also need to be programmed, covering the operational, administrative, financial, motivational and that of others –because in all of these aspects, PDAM has limitations

PDAM TIRTA SARI - BINJAI MUNICIPALITY

Kota Binjai has an area of 90.32 km2 that consists of 5 sub-districts and 37 vilages. The sub-districts are: South Binjai, Binjai Kota, East Binjai, North Binjai and the West Binjai.

The number of population of Kota Binjai at the end of 2003 is 223.451 people, while in 2004 it is estimated as having reached 224,814. The service coverage of PDAM Tirta Sari until December 2004 is about 21% from the total population of the city.

At present, PDAM Tirta Sari Kota Binjai has 3 (three) Production facilities with total installed 210 l/s, consist of 1 (one) water treatment plant from the river with 200 lps capacity and 2 (two) deep well with 5 lps capacity each.
Service area at kota Binjai is relatively flat. All of the distribution system is using pumping system. In order to reduce energy cost, currently PDAM does not operate deep wells anymore. Problem facing by PDAM is swallowing process happened at intake because of the sand mining along the river flow nearby. This condition cause reducing of the height of the water surface at the raw water intake.

In December 2004 the clean water produced by PDAM Tirta Sari Kota Binjai was 295.981 m3/month or 112,32 lps, while the distributed water was 282.105 m3/month or 107 lps. The sold water was 204.467 m3/month or 77,6 lps. So the water loss at PDAM Tirta Sari Kota Binjai in 2004 was 27,52%.

The number of customer at PDAM Tirta Sari at the end of 2004 is 9.379 connections. The ground water condition in most of service area is not good in terms of quality, so this become a market opportunity for the PDAM to increase its number of customers.

The existing organizational structure of PDAM Tirta Sari Kota Binjai was established by a Decree of Binjai Municipality Mayor No. 061.1 – 530 / SK / 2000 on the Adjustment of Organization and Management of PDAM Tirta Sari Kota Binjai dated May 9, 2000, that consist of:

- 1 (one) Director
- 2 (two) Department Heads (General Administration & Finance and Technical)
- 8 (eight) Section Heads (4 persons under General Administration & Finance Head, 4 under the Technical Head).
- Head of Internal Supervisory Unit – the same level as a Section Head.

The main findings of the assessment result are:

- The service coverage of PDAM Tirta Sari Binjai municipality in 2004 is about 21% from the total population of 224.814 people for the same year.
- The water sources installed capacity is 210 lps while the produced water capacity was 112,32 lps, so the idle capacity was about 111,68 lps.
- The average water consumption per connection was 21,80 m3/unit/month.
- Decreasing of the height of surfaced water at the river water source happened due to the sand mining along the river flow nearby.

- The water treatment plant need a little repair at the bottom part of unit.
- The recorded capacity at present need to be evaluated further because it was estimation from the technical department due to the malfunctioning or master meter is not installed at several production facilities.
- There is very limited data available on the distribution network system, including the as built drawing of the system.
- The energy consumption is high enough, achieving 30% from the total cost.
- The average water loss of the system was 27,52%.
- The billing system has been computerized but not yet integrated with finance, need to be developed. As for the reporting, it has also used computer system although in a very limited condition.
- The financial aspect is *the weakest in the PDAM, the amount of long-term debt has reached Rp 16,1 Billions with no ability to pay whatsoever.*
- The operating ratio is about 50%.
- The existing Corporate Plan has been expired this year, i.e. from 2002 – 2005, mostly never been implemented.
- The human resources of PDAM Tirta Sari are very limited and the opportunity to receive training is very scarce.

As for the recommendations are:

- The PDAM Tirta Sari could still increase its service coverage by utilizing the idle capacity that are still big enough, i.e. about 111,68 lps.
- The average water consumption at each connection is good enough and could still be increased, but need of support with an adequate production and network readiness from the PDAM. Besides, the market opportunity is very promising, due to the bad quality of soil water in Kota Binjai.
- In order to utilize the idle capacity and reduce the cost of selling water per unit, it is recommended that the PDAM prepare and implement a program to increase the number of connections.
- Through the optimization program, such as utilizing the idle capacity, increase the average of water consumption, reduced water loss from 27,5% to 20% and enlarge the service coverage from 21% to 30% of total population, then expected the number of connection could be increased about 5.300 customers in 5 years. But those targets need hard work, because historically from 2002 until 2004 the average addition of connections only 300 per year.
- The PDAM Tirta Sari has one integrated system that need a better arrangement. The improvements are necessary for the production system and distribution network to increase the performance of the distribution, volume measuring as well as electrical energy consumption that so far has not optimally functioning. The uninstalled of the master meter used caused invalidity of water consumption as well as water loss recording.
- The rearrangement of the administrative and financial system is also needed because either the existing billing recording of water consumption, already computerized, but still very limited, mostly still manually done, so the possibility of recording mistakes is very high and hampering the service activity toward the society. Therefore the program to improve the administrative and financial *using computer* is mostly needed.
- The present 27,5% level of water loss (NRW) is good enough, but need to be studied further because it is still an estimation only. By the arrangement

of billing and financial system mentioned above as well as that of the production and the overall network, the water loss could be reduce effectively. The causes of NRW has not been studied in detail, but we believe that beside the administrative aspect, and water loss from technical side is due to broken water meters as well as inefficient use of them. A better arrangement of the system, will increase of supplied water, service coverage and revenue with lower cost.

- At present, the validity of a Corporate Plan has been expired and yet it has not been implemented because of several reasons. Therefore the making a Corporate Plan for 2006 – 2010 need to be programmed. A strong support from the government is required, especially from the province and central government, because the present condition of management, mainly regarding financial matters, is *having a very serious problem*.
- The improvement of human resource capability at PDAM Tirta Sari is also need to be programmed, covering the operational, administrative, financial, motivational, etc because in all of these aspects the PDAM has limitations.

PDAM TIRTANADI - MEDAN

Medan City has area of 265 km2. The area of Medan city and its surrounding area defined as service area of PDAM Medan added by several sub-districts in Kabupaten Deli Serdang that are bordering with Kota Medan, covered the sub-districs of Deli Serdang, Sunggal, Pancur Batu, Percut Sei Tuan, Namorambe, Labuhan Deli, Tanjung Morawa, Hamparan Perak and Batang Kuis.

Based on Joint Cooperation Agreement (KSO), PDAM Medan also serves several areas outside the city of Medan, i.e. in Kabupaten Tanah Karo, Deli Serdang, South Tapanuli, Mandailing Natal, Nias, Central Tapanuli, Toba Samosir, Parapat/Simalungun, Samosir and that of South Nias.

By the end of 2004, PDAM Tirtanadi Medan serves 1,858,458 people at Medan City and surrounding area (service zone I) and 418,086 people at KSO area (service zone 2). Besides providing clean water for the people, PDAM Kota Medan also managed the waste water system, with 9,568 connections.

As for the number of customers, by the end of 2004 PDAM Kota Medan has 322,757 customers with details as follow:

- Kota Medan, Sibolangit (service zone 1): 294,821 connections
- KSO Area (service zone 2) : 40,518 connections, consist of :
  - Deli Serdang District (Sub-districts Lubuk Pakam, Perbaungan, Tanjung Morawa, Tembung, Batang Kuis and Pantai Cermin): 10,445 connections
  - Brastagi: 6,122 connections
  - South Tapanuli District: 9,302 connections
  - Central Tapanuli District(Sub-district Pandan): 2,115 connections

- Nias District (Kota Gunung Sitoli and Teluk Dalam): 4,416 connections
- Mandailing Natal District: 1,018 connections
- Parapat: 2,485 connections
- Samosir: 1,217 connections
- Toba Samosir District: 3,398 connections

To serve the customers, PDAM Tirtanadi – Medan is using some water production facilities as follow

Service Zone-1:

- Several springs at Sibolangit: 600 lps
- WTP Sunggal-Belawan river: 1,500 lps
- WTP Deli Tua-Deli river: 1,400 lps
- WTP Belumai-Belumai river: 400 lps
- WTP Hamparan Perak-Belawan River; 100 lps
- Several Deep Well at Belawan: 75 lps

Service Zone-2 :

- Deli Serdang, WTP Sungai Ular 118 lps and deep wells 72 lps
- Brastagi, Spring : 88 lps
- South Tapanuli District: spring, 168 lps
- Central Tapanuli District; WTP-river 49 lps
- Nias Distrit (Kota Gunung Sitoli and Teluk Dalam): spring 38 lps and WTP 7 lps
- Mandailing Natal District: spring 15 lps and WTP-Lake Toba 10 lps
- Parapat: spring 19 lps
- Samosir: WTP-Toba lake, 20 lps
- Toba Samosir; spring 40 lps and WTP-Lake Toba 35 lps

From the 4,175 lps installed production capacity at service zone 1, water produced in 2004 was 4,263 lps (134,438,300 m3/year), distributed water of 131,398,931 m3/year (average 4,167 lps) and sold water of 103,559,185 m3/year (average 3,284 lps). So the water loss in 2004 was 21.2%. We can see that water production volume is bigger than installed water production capacity. It could happened due to the demand is higher than installed capacity, and to cover those demand, WTP Sunggal was operated higher than its capacity. And the consequencies is backwash process is more frequent than original design.
Since at service zone 2 (KSO area) from the 669 lps installed production capacity, water produced/distributed in 2004 was 555 lps (17,488,616 m3/year), and sold water of 12,670,351 m3/year (average 402 lps). So the water loss in 2004 ws 27.6%.

Table 4.1. show number of connection, volume of water production, water sold an Non Revenue Water at Service Zone 1 (Medan and surrounding area) and each KSO area (Operations agreement area).

Average consumption in 2004 was 29.5 m3/month/customer and average tariff was Rp 1.560/m3.

The number of employees in 2004 is 1,169 persons, which 425 persons are working at central office, 525 person at Service zone 1 and 219 persons at KSO office.

The existing Corporate Plan only cover until the year of 2005. Therefore in the first year a new Corporate Plan will be made, including a Customer Satisfaction Survey as well as other things that relate to increase the financial performance of the PDAM, among others tariff review, production and distribution cost reduction as well as capacity development.

Table 4.1. Number of Connection, Water Production, Water Sold and Non Revenue Water, PDAM Tirtanadi – Medan , Year 2004

No	Service Area	Number of Connection (unit)	Installed Capacity (l/s)	Average Production (l/s)	Average Water Sold (l/s)	NRW (%)
A	Service Zone 1					
1	- Medan&bordering area	294,821	4,175	4,263	3,284	21.2
B	KSO Area					
1	- Brastagi	6,122	88	111*	86	22.3
2	- Deli Serdang	10,445	180	129	75	41.32
3	- Parapat	2,485	19	30*	23	25.0
4	- Samosir	1,217	20	9	NA	NA
5	- Toba Samosir	3,398	75	42	32	25.0
6	- Central Tapanuli	2,115	49	44	33	25.0
7	- South Tapanuli	9,302	168	165	101	38.8
8	- Mandailing Natal	1,018	25	14	10	25.0
9	- Nias & South of Nias	3,654	45	8	44	25.0

APPENDIX II-E

PDAM ASSESSMENT–SPECIAL IMPERATIVE AREA–PDAM BALIKPAPAN

Balikpapan is the capital of East Kalimantan Province, consist of 5 Kecamatans (Balikpapan Selatan, Balikpapan Timur, Balikpapan Utara, Balikpapan Tenga dan Balikpapan barat) and 27 Kelurahans, with totl area of app. 500 km2 and population of 28.5 million people.

Average water production in year 2004 was 755 l/s and serve 73% of total population through 61,233 customer connections. Actually installed water production capacity of PDAM Balikpapan is 1,115 l/s, but due to the decreasing of raw water quantity during dry season, PDAM Balikpapan in year 2004 only produced clean water 755 l/s average, and distributed 731 l/s, since average water sold only 506 l/s. It mean average water loss was 31%

PDAM has 6 unit water treatment production, as shown at table 2.1 below :

Table 2E - 01. Water Treatment Plant, Reservoir Production and Water Sources PDAM Balikpapan – year 2004.

No	Water Treatment Plant		Capacity of Production Reservoir (m3)	Raw water Resources
	Location	Capacity (l/s)		
1	Kampung Damai	400	1,650	Manggar Dam & Klandasan river and 3 units deepwell
2	Batu Ampar	550	1,750	Manggar Dam & 8 units deepweel
3	Manggar	20	125	Manggar Dam & 2 units deepwell
4	Gunung Sari	100	100	6 units deepwells
5	Gunung Tembak	5	30	Selok Api River
6	Teritip	40	125	9 units deepwell
	Total	1,115	3,705	

Beside 6 production reservoirs, PDAM Balikapan has another 10 distribution/booster reservoirs with total capacity of 7,600 m3

Main problem of PDAM Balikpapan is availability of raw water during dry season. During dry season the volume of all raw water are decreased, as well as water volume of Manggar Dam. Water in Manggar Dam is from rain water.
To solve this problems, PDAM is exetending the capacity of Manggar Dam from 3 million m3 to be 16 million m3.

Due to Balikpapan city is hilly area, to distribute clean water at Balikpapan need pumping system, as well as flowing the water at transmission pipe.

The age of pump, either deep well pumps, intake pumps or distribution/booster pumps already old and pump efficiency is already decrease and estimated only 50-60%. This condition make energy consumption is high and energy cost is 40% from total operation and maintenance cost. Other problems are facing by PDAM Balikpapan, is Non Revenue Water is 31%, water pressure at distribution network is not spread evenly, and balance/distribution is never full water. It is predicted NRW is high due to the condition of many pipe is not good, many illegal connections and meter reading is not accurate

New connection fee is Rp 1,350,000 and base water tariff is Rp 3,321/m3. Average consumption in year 2004 was 22 m3/month/connection, since average tariff was Rp. 3.937 per m3.

Table 2E-02, 2E-03 and 2E-04 show some technical, coverage level and tariff of PDAM Balikpapan, since table 2E-05 shows financial data's of PDAM. Qualitative data of PDAM could be seen on table 2E-06.

Table 2E-02. Water Source, Production, Distribution, Sold Water and Water Loss, PDAM Balikpapan - Year 2004.

No	Description	Volume	Remarks
1	Number of Service Area		
	* Main Area	1	
	* Sub Area (IKK)	0	
2	No of Water Prod. Sources		
	* spring	-	
	* river	2	Klandasan & Selok Api rivers
	* deep well	24	
	* others	1	Manggar Dam
	Total	27	
3	Installed Production. Capacity (l/s)	1,115	
4	Average Production (l/s)	755	
5	Ave. Distribution (l/s)	731	
6	Ave. Water Sold (l/s)	506	
7	Water Loss (%)	31	

Table 2E - 03. Population, Population Served, No of Connection and no of PDAM Employee, PDAM Balikpapan - Year 2004

No	Description	Volume	Remarks
1	Population	495,314	
	* Total	447,900	
	* Served Area	324,592	
	* Served		
2	%tage served, from		
	* total population	66	
	* served area	72	
3	No of connection	61,323	
4	Hour/day served	24	
5	No of employee	285	Permananet staff 280, and non permanent 5

Table 2E - 04. Base Tariff, Average Tariff and Connection fee, PDAM Balikpapan - Year 2004

No	Description	Rp.
1	Base Tariff (Rp/m3)	3,321
2	Average Tariff (Rp/m3)	
	* Year 2004	3,937
	* Year 2003	3,403
3	Connection fee (Rp)	1,350,000

Table 2E - 05. Financial Data (Rp. Mill)
PDAM Balikpapan – Year 2004

No	Description	Unit	Vol
1	Annual operation ex-penses (not include depreciation & interest)	Rp.mill/year	34,403.8
2	Annual Operating revenue	Rp.mill/year	55,880.3
3	Annual operating cost (include depreciation & interest)	Rp.mill/year	46,380.9
4	Current assest	Rp mill	40,102.5
5	Current liabilities	Rp mill	12,207.2
6	Annual debt service	Rp.mill/year	43,018.1
7	Nett operating income (before interest & tax)	Rp mill	17,030.3
8	Historical value of tangible assests	Rp mill	59,934.4
9	Depreciated historical value of tangible assets	Rp mill	96,457.5
10	Operating income (before depreciation)	Rp.mill/year	32,476.6
11	Annual labour cost	Rp.mill/year	10,078.9
12	Annual energy cost	Rp.mill/year	11,964.9
13	Revenue from annual water sales	Rp.mill/year	55,880.3
14	Year end accounts receivable	Rp mill	7,022.0
15	Revenue from annual domestic water sales	Rp.mill/year	52,709.2
16	Revenue from annual social water sales	Rp.mill/year	1,178.1
17	Revenue from annual commercial & industruial water sales	Rp.mill/year	6,823.0
18	Total Debt	Rp mill	13,466.0
19	Shareholder equity	Rp mill	71,187.2

Table 2E - 06
Qualitative Data
PDAM Balikpapan

Description	SIA Balikpapan (M)
Corporate Plan (CP)	
* Already has CP	yes
* Latest year of CP was perpared/up dated	2000
* CP used as one of basic consideration for yearly programs?	yes
PDAM Orientation to Customer	
* Ever been conducted Customer Survey Satisfaction	yes
* Latest year to conduct CSS	2005
* Any part of PDAM organization structure that responsible to handle/	yes
handle complaint/information from customers/communities	
Training	
* Generally training attended by PDAM staffs, give benefits to PDAM	no training
* PDAM staffs still need trainings	
Inter-regional issue of PDAM	
* Any inter-regional/national issue that required to be discussed/solved	yes
* If Any, write down	-
	yes
	yes
Bench-marking	
* PDAM has been joining Bench-marking program	yes
* Reason does not join Bench-marking program	-
* PDAM get the benefits by joining BM program	yes
* BM useful for making yearly PDAM targets	yes
Water Quality monitoring	
* PDAM monitor water quality	yes
* Reason does not monitor the water quality	
* PDAM has appropiate equipments/tools for taking a water sample	yes
* PDAM has appropiate facilities/laboratory equipments	yes
GIS/MIS	
* PDAM has drawings 0f sping capture/intake/Water Treatment Plant	yes
* Accuracy of distribution network drawings	90%
* PDAM has been using GIS since	2000
Water Loss (NRW)	
* NRW level already urgent to be handle	yes
* PDAM has yearly target to reduce NRW level	yes
* PDAM conduct reducing NRW based on programmed	yes
* Any part of PDAM org. structure responsible to reduce NRW	yes
* PDAM staffs that handling water losses already has proper skill	no
* PDAM has proper equipment for reducing water lossactivies	yes

Table 2E - 06
Qualitative Data
PDAM Balikpapan (cont.)

Description	SIA Balikpapan (M)
Tariff	
* Latest year of tariff increase	2004
* Current basic tariff (Rp./m3)	3321
* PDAM need to evaluate present tariff in near future	no
* Connection installation fee (Rp.000)	1350
* Possible to pay in-installments for new connection fee	no
Efficiency of Sub-System (IKK)	
* PDAM consider IKK as a problem for PDAM, especially from financial point of view	
Meter Reading & Billing	
* Any problems of meter reading (either meter reader, effectiveness, efficiency and	yes
and accuracy)	
* Meter reading conducting by PDAM or third parties	PDAM
* Average number of meter read/day/meter reader	250
* Any routine audit of meter reading	no
* Any problems with billing (procedure, making bill & bill collection)	yes
* PDAM already satisfied with billing collection performance	no
Energy Consumption & Pressure Management	
* Percentage of energy cost from total O&M cost (not incl.depreciation)	40%
* PDAM consider energy cost as one of the biggest expenditure	yes
* Need to reduce energy consumption	yes
Production & Distribution cost	
* O&M maintenance has been doing effective and efficient	not yet
* Already have Standard Operation Procedure for O&M activities	part of
* Any installed equipment make less effective/efficiency of O&M	yes
* Chemical dosing comply with raw water quality	yes
Acces urban poor to PDAM piped water	
* PDAM give priority to serve urban poor	no
* PDAM already give enough opportunity for urban poor to consume	already
clean water from PDAM	
Debit & Quality of water sources	
* Quantity of raw water sources is different during rain season and dry season	60%
* Quantity of raw sources is less than previous years ago	yes
* Quality of raw water is different during rain season and dry season	yes
* Quality of raw water is less than previous years ago	yes
Increasing Production capacity	
* Production capacity comply with design capacity	no
* PDAM need to increase production/distribution facilities	yes

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