

# ***Euro Promocap Iwat project***



A project co-financed by the European Union

EU - Indonesia



Small projects Facility



***Make more with same , or make same with less***

# *Disclaimer*

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# *The Indonesian water sector*



Feb 2007

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Few exceptions are hiding the reality: Indonesian water sector is struggling harder and harder , year after year.



Boyolali



Jakarta



Big cities or small towns

**Indonesian water sector does not get the required recognition as a strategic infrastructure pillar.**





**Palembang assisting poor villagers**

## Water crisis hits evacuees in N. Sulawesi

**Jogjaja Rajawali**  
**The Jakarta Post**  
 Hundreds of residents displaced following the increasing activity of Mt. Karagaung on Sula Island, North Sulawesi, were facing a shortage of drinking water Tuesday.

Since the volcano erupted on the top alert status last week, hundreds of residents on the island, which lies north of the province's capital city Manado, have been told to evacuate their houses and live in shelters.

"We've been experiencing a water shortage since Sunday. It's hard to find clean water to cook with and drink, all the water containers are filled with lava and mud," an East Sula resident who has been staying in a shelter in West Sula, told The Jakarta Post on Tuesday.

Another East Sula resident staying at the shelter, Hulisin Turron, said there was enough rice but nothing to drink.

He said they had to queue for water from the Sula water utility. "In order to get clean water, we can no longer depend on wells or containers, since all of them are dirty and muddy," he said.

More than 3,000 villages had to safety Friday after Mt. Karagaung began belching hot gas and lava. Mining with heavy rain, lava from the volcano has created streams of lava which have pushed down the mountain's slopes and inundated villages.

When asked to confirm the water shortage, the head of East Sula district, R. Arso, denied the village shelter was affected, saying the water utility was delivering water daily.

"We continue to supply them with drinking water. Maybe only one or two people did not get their water, then complained."

He said the administration was working around the clock to ensure the refugees had access to food, shelter and medical treatment. "We've been distributing aid received from Sangihe regency administration as well as from North Sulawesi provincial administration," Arso told the Post.

The alert status for the volcano was not downgraded Tuesday, though the hot gas cloud was declining.

"Based on reports from observation post in Sula, Karagaung remains on top alert status but its activity has decreased," Arso said.

Currently, he said, 1,100 families or 3,400 people from three villages in East Sula, two villages in Central Sula and one village in West Sula were in danger in the event of an eruption. So far, 209 families or 1,389 people have abandoned their homes to live in shelters.

"Evacuees were accommodated in temporary shelters provided by the administration, while some others are staying with their relatives or using relatives in schools or churches. Many of the displaced residents return home in the daytime and back to the shelters at night," he said.

According to data from the mining sectors and survey office in Manado, Karagaung's last recorded eruption was in 1975, with no casualties reported. This was followed by further eruptions, with the last one recorded in 1940 in which two people died and nine others were injured.



## Public told to conserve water

**President Sudho Bambang Yudhoyono** (photo above) refreshes himself with water from a well in Sumber village, Wonorejo, Central Java.

**Resources Purnomo Yudiantoro** said that the country had some 3,000 billion cubic meters of water reserves, and at least 49%

## President SBY visit to central Java

Indonesia had a great deal of water resources, they were not evenly spread. "Some water can be obtained through drilling but that costs a lot," said Sudho.

He also took the opportunity to defend the much-criticized Law No.7/2004 on water resources, saying it was enacted to ensure that the state fulfilled its obligation to provide clean water to the public.

The law is currently being challenged before the Constitutional Court, with non-governmental organizations arguing that it commercializes water and converts it into an economic commodity.

Minister of Energy and Mineral Resources Purnomo Yudiantoro said that the country had some 3,000 billion cubic meters of water reserves, and at least 49% of these areas, people have to pay between Rp 25,000 and Rp 30,000 for just one cubic meter of water. In Jakarta, people only pay about Rp 3,000 for the same amount of water," said Djoko (Minister of Energy and Mineral Resources Purnomo Yudiantoro).

Wonorejo, said Central Java Governor Murdhyaningtyo, resulted in farmers losing up to Rp 227.5 billion (US\$34.5 million) every year.

Minister of Public Works Djoko Klerman said that over 940 villages were categorized as water critical due to problems in accessing water sources.

"In these areas, people have to pay between Rp 25,000 and Rp 30,000 for just one cubic meter of water. In Jakarta, people only pay about Rp 3,000 for the same amount of water," said Djoko (Minister of Energy and Mineral Resources Purnomo Yudiantoro).

## Water shortage makes life hard in Bandung

**Vidi Di Howard**  
**The Jakarta Post**  
 Much of East Sunda's time is spent getting water. The 40-year-old resident of Sindang village, Asraman district of Bandung, must always be on the alert for water flowing through the drum in front of her house, especially during the dry season.

If she hears water in the drum, she quickly opens a valve connecting it to a shallow well about five meters away in front of her house.

The water flowing from the river atop Sindangtaya hill in the district is of great importance to Sula and manufacturing areas of the Bandung basin.

Based on data from the Ministry of Energy and Mineral Resources, the excessive use of ground water in the basin area has significantly deteriorated the ground water conditions there.

Head of the Ground Water Conservation Office, Damar Susno, said that they began recording data about ground water conditions in the Bandung basin area in 1977.

"At that time, we drilled about 180 meters into the ground in the Cikarang river valley area. Water spurted upward as high as 70 meters. But now in the Bandung basin area, for example, cracked areas have, for example, there is not a single drop of water after drilling for 100 meters," he said.

When calculated, the water level in a number of industries in the Bandung basin area was found to have dropped in around 100 meters over a period of around 37 years.

The condition has been declared critical because the water level has dropped more than 60 percent.

The ground water reserve in the Bandung basin area is only 140 million cubic meters per year, but water factories said the government had not yet provided industries with tap water. As a result, the factories still pump ground water for their operational needs.

A researcher from the agency, Agus Taufik, discovered eight locations where sinkholes had appeared because the ground water which had previously supported the surface layers of soil had been siphoned out, and this had created underground cavities called cone depressions.

The worst affected area is located in South Cimahi, where the land surface has sunk at least 22.4 centimeters, according to data recorded in 2005.

Seven other locations experiencing the problem are: Dayeuhkolot (45.8 centimeters), Rancaekek (24.9 centimeters), Banjaran (13.5 centimeters), Bojongsari (14.1 centimeters), Majalaya (15.9 centimeters), and Ujungkiria (16.5 centimeters).

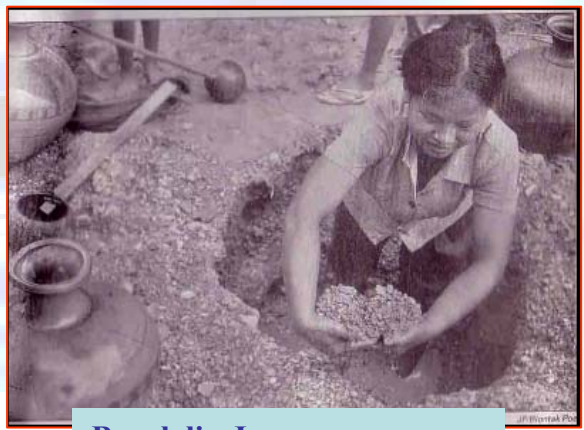
An investigation conducted by the agency on factories since 1970 showed that 888 drilled wells which pumped out around 300,000 cubic meters of ground water annually, existed in South Cimahi area in 1976.

The amount of wells increased preceding the economic crisis of 1998. The industrial boom caused the number of drilled wells to reach 2,387, with the highest volume of ground water pumped reaching 77 million cubic meters.

The closing of numerous factories during the economic crisis has somewhat alleviated the pressure on ground water resources.

In 2005, the number of drilled wells in the Bandung basin area had dropped to 2,238, decreasing the amount of water siphoned to 65 million cubic meters.

The West Java administration has continued reforming the factories in Ciptonegara, the west of Bandung region, where their impact is expected to be less damaging.



**Boyolali - Java**

# Kyoto : Water for all?

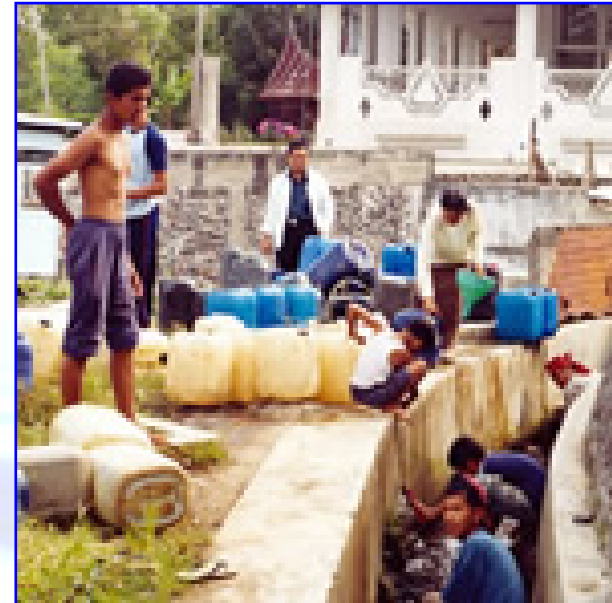




*Indonesian society does not realize yet how critical is the Indonesian Water sector condition.*



**Paris in 1704**



**Many Indonesian cities in 2007**

# Aduh , NRW in Indonesia...

- 2 years ago , watching TV program I heard some comments matching the Water sector

**Kasyandeh loe!!!**

- Today , watching the same Indonesian TV, I discovered a new moto :

**Capek Deh !!!**



# Fundamental economic target of a proper N.R.W. program

- Reduce your losses ,
- Increase your income



Money talks

# N.R.W. is not new in Indonesia

- Many foreign institutions have granted lot of financial support, many initiatives have been developed since many years.../....;
- Private Jakarta operators, duly considered as world leaders, are rating NRW as a top priority
- PDAM are desperate for NRW expertise;
- But ... which model to follow?

# Justification of NRW program

- Like most water distribution systems around the world, Indonesian network may have suffered under-investment for many years.
- Organizations have embarked upon extensive and expensive replacement programs.
- Such re-placement scheme may be considered to be necessary, but it needs to be run in conjunction with active NRW Reduction schemes in order to provide cost-effective solutions.



# By replacing old and leaking pipes, will NRW problem be solved?

- No , for a number of reasons:
  - Most of physical leaks takes place on the tertiary network.
  - Consequently, we could replace all of the distribution pipelines and still continue to suffer a very high NRW rate.
  - If effective pressure management is not undertaken before a system is renewed, the levels of NRW will increase rather than decrease, and will result in a nightmare
  - As pipelines are replaced, the pressures in the distribution system gradually increase. It puts greater stress on an already fragile system causing an increased number of bursts on a weak network.

# What is the risk ?

- If a mains replacement program is carried out without an improvement in the understanding, in the operation and maintenance of the network,
- many problems are likely to be deferred to a later date, only to need further substantial investment to rectify them.

# Non technical obstacles

- Illegal connections represent significant problems in Indonesia, while many countries don't even think setting-up an "Illegal connection dept".
- This inevitably worsens the NRW situation.
- and brings the question of the "WATER CULTURE" in every level of the Indonesian society.



# Illegal connection example



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Typical difficulty: piping variety, poor quality, lack of technical skill .

- There are many types of pipeline material used in the distribution systems AC pipes, cast iron, concrete, GIP, DCI, steel and most commonly plastic (PVC, HDPE);
- Problems are related to corrosion, to breaks and other technical reasons,
- but as well to installation defects, due to poor material knowledge from staff.

# Technical failures due to inappropriate material.



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# Staff qualification and capacity building

- In addition of a strong commitment and support from management ,
- NRW activities require specifically trained and motivated staff engaged on monitoring NRW targets over the years

# Is there any relation between culture and technical environment?

- Indonesian culture is worldwide appreciated for its tolerance, sense of compromise or “flexibility”;
- However, when it comes to technical environment, **GOOD ENOUGH IS NEVER ENOUGH**. We should look for perfection.
- The answer should be “Yes” or “No”, never “OK for this time”!
- But to reach this target, technical expertise is required

# Quality control remains a key issue, while implementing NRW

- A high NRW rate is often linked to field problems;
- Most of field problems come from poor QA/QC system;
- Technical field audits are almost never undertaken, while it should be common practice.

## QA/QC obstacles to an efficient NRW strategy

- Lack of quality assessment references;
- Lack of technical knowledge to perform independent assessment and qualification;
- Poor documentation and lack of inspection tools;
- Prone to internal and external collusion to accommodate “compromise”;



# Inspection, certification and qualification remains a major concern

- Unlike what is happening in the Oil & Gas industry or in the private sector, Indonesian certification organizations are not trusted, while they should be promoted by the whole water sector.
- Standards are almost never analyzed;
- As a result, Indonesian water sector is not building any foundation for a real technical expertise and depend on... Compromise.

# ***Euro Promocap Iwat project***



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**The project vision :**  
**Make more with same, or make same with less**

***PDAM Palembang made it very clear:  
No more N.A.T.O. project please!***



# A political project to support the Indonesian water sector

- This “Grant” project was co-financed by the European Union delegation;
- Main objectives were to promote dialogue, assist the civil society in line with the decentralization process and participate to the development of the Indonesian economy.



*Initially 4 PDAM were selected, but Bandung was later on included*



Banjarmasin



Makassar



Palembang



Manado

# *How did our capacity building program develop?*

- **Having performed a detailed and specific profile analysis for each PDAM,**
- **Having identified strength and weaknesses,**
- **Having undertaken management level workshops on strategy and governance,**
- **Having defined the clear PDAM objectives,**
- **We gave priority to vocational training , targeting field operations: staff involved in installation and maintenance.**



*Through workshops , training sessions and pilot projects :*



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*Several sessions were organized to exchange views and analyze deficiencies*



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# Communication with civil society was promoted systematically



Political bodies and policy makers



# *Involving population*



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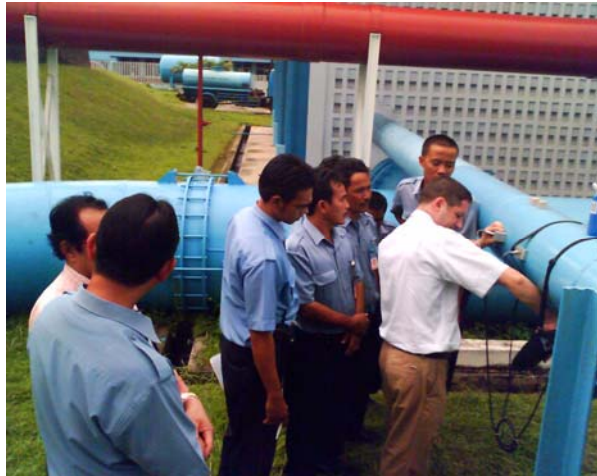
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## The following N.R.W. topics were undertaken

- House connection, under-pressure tapping
- Metering, reading and billing
- Data logging,
- D.M.A. programs,
- Pressure management: PRV.
- Leak detection,
- Leak repair ,
- Pipeline installation, operation and maintenance,
- Flow metering: ultra sonic , electromagnetic.

# Ultra-sonic flow metering workshops



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# Pressure management workshops



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# Organization

- An NRW team was built in each PDAM, which in some PDAM has lead to the setting up of lasting solution:



# *PDAM Palembang created a special NRW team with special office*



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# *PDAM Makassar*



To palliate to the communication gaps between departments and meet project targets, the organization was modified and adjusted several times



*PERPAMSI managed to motivate each PDAM and project clearly progressed thanks to a very strong commitment from PDAM management and mayors*





# *Key performance Indicators were systematically defined*

- Each PDAM was handled according to their specific technical profile,
- Each PDAM decided about their own priority ,
- Performance indicators were clearly defined
- To monitor the project progress and the program efficiency



# *Experts missions were organized*

- To cross-check the technical environment of each PDAMs ;
- Systematic technical audit were organized with each director and PDAM management ;
- Specific technical topics selected by PDAMs were studied



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# *Training sessions*

- Were organized in each PDAM ,
- Involving the appointed PDAM staff participating to the project ,
- Including **daily workers and sub-contractors**



# Workshops

- The training sessions were followed by workshops highlighting quality procedures in accordance with actual needs from each PDAM
- Each session gave priority to communication and was adjusted to local conditions;





# *capacity building workshop in Banjarmasin*

- Based upon **existing leak reports**, and without any further investment, project has lead PDAM to determine its weakness.
- The conclusions allowed PDAM to adopt corrective solutions, **WITH IMMEDIATE IMPROVEMENTS.**





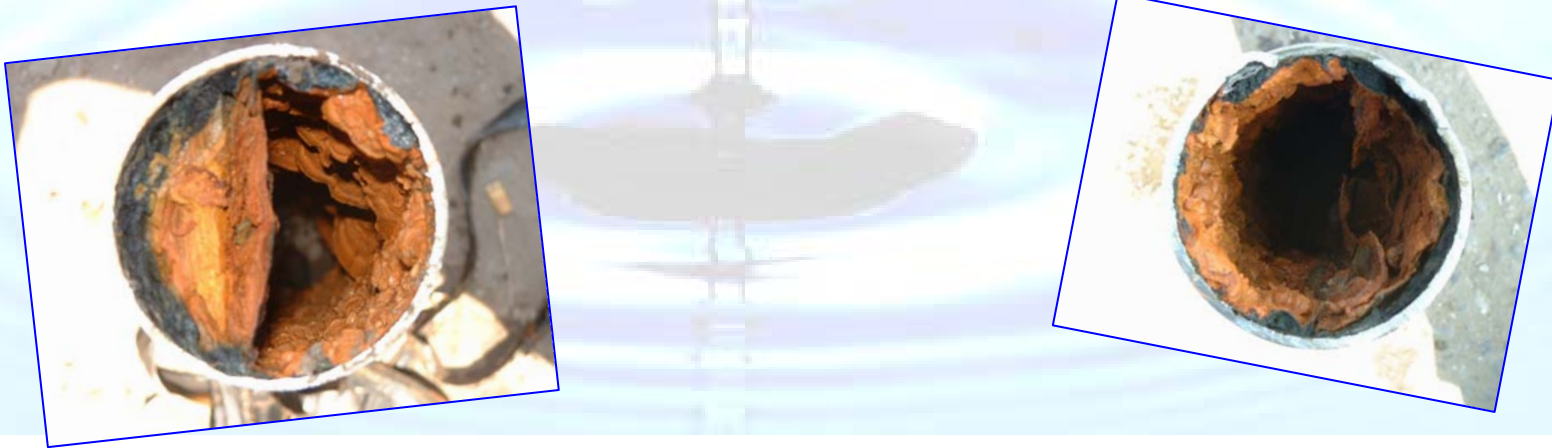
# An example of strategic conclusion

- A field workshop allowed to understand why the volume in the pipe was not enough and why water meters were not reading: tapping was deficient and water was not flowing.



# *capacity building workshop in Makassar :*

- Our actions highlighted the urgent need to change the type of pipe to avoid corrosion, sedimentations and reduce obstructions in steel pipes.
- HDPE pipes was never used in Makassar while it is now systematically installed. This step allowed a better flow, a reduction in pipe failures and a better service to the population.



*Studies were performed on strategic choices:  
cost of a leak per PDAM*

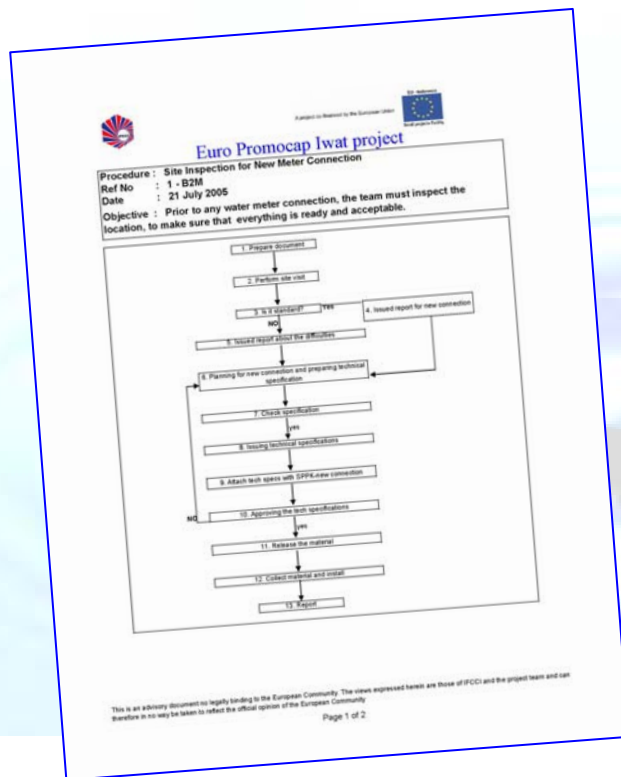


## Leaks were recorded and analyzed .

Category	Cumul
<b>I. Leaks</b>	
1. Boring	1536
2. Pipa Dinas $\varnothing$ ½" - 1¼"	2875
3. Pipa Tersier $\varnothing$ 63 mm - 90 mm	822
4. Pipa Sekunder $\varnothing$ 110 mm - 160 mm	194
5. Pipa Primer $\varnothing$ 200 mm - 850 mm	22
<b>JUMLAH</b>	<b>5449</b>
<b>II. GANGGUAN SUPLAY &amp; KUALITAS</b>	
1. Service Boring ( Air Macet )	727
2. Air Keruh	52
3. Pencucian pipa	542
4. Pengaturan Valve & Air Valve	475
<b>JUMLAH</b>	<b>1796</b>
<b>III. PENUTUPAN PIPA LAMA</b>	
1. Pipa Distribusi $\varnothing$ ½" - 1¼"	340
2. Pipa Tersier $\varnothing$ 2" - 3"	28
3. Pipa Sekunder $\varnothing$ 4" - 5"	0
4. Pipa Primer $\varnothing$ 8"	0
<b>JUMLAH</b>	<b>368</b>
<b>TOTAL JUMLAH</b>	<b>7613</b>

# *To promote sustainability: S.O.P.*

- S.O.P. were tailor written to meet PDAM profiles;
- To allow a better control on their operation ,



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# *Training sessions focused on installation defects and obsolete technologies*



Different drilled flanges



Association of different products



# *Guidance to selection appropriate material*



Many products used in Indonesia don't meet International standards or efficiency criteria. They immediately lead to leak



**Example of leak due to poor installation associated to deficient material**



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# *New installation after 10 minutes*



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# Workshops allowed identifying weaknesses



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# Pilot projects highlighted incompatibilities with correct billing



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# Field staff was given priority



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# *Pilot projects*

- To implement the training sessions , pilot projects were decided ,
- To allow pipe fitters and technicians install material paid by the project :



# *Pilot projects were organized in each city*

- Installation of new house connections ,
- Leak repair ,
- Data collection,
- Special strategy for big customers
- Maintenance of network





PEMERINTAH KOTA PALEMBANG  
**PERUSAHAAN DAERAH AIR MINUM TIRTA MUSI**



TIRTA MUSI

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BEKERJASAMA DENGAN



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*Euro Promocap Iwat project*

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**Proyek Percontohan Pemasangan Sambungan Baru  
 dalam upaya menurunkan tingkat kehilangan air  
 di PDAM TIRTA MUSI Kota Palembang**




PEMERINTAH KOTA BANJARMASIN  
**PERUSAHAAN DAERAH AIR MINUM BANDARMASIH**




BANDARMASIH

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BEKERJASAMA DENGAN



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*Euro Promocap Iwat project*

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**Proyek Percontohan Pemasangan Sambungan Baru  
 dalam upaya menurunkan tingkat kehilangan air  
 di PDAM Bandarmasih Kota Banjarmasin**



*Each pilot case was clearly identified and recorded for further analysis*



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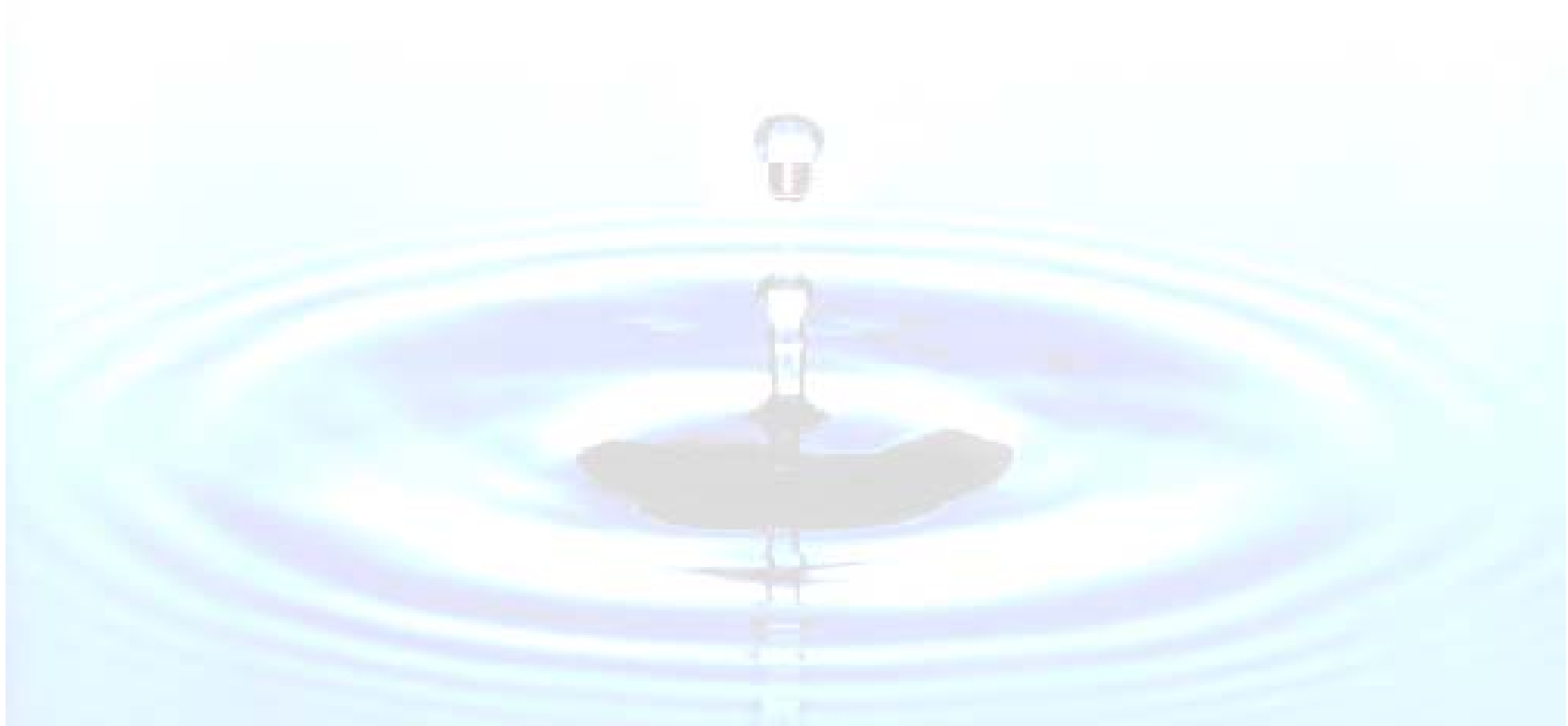
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# Progress was immediate



This kampung in Banjarmasin did not have any water for years

*Progress was closely monitored and analyzed*



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# Strategic approach for big clients

- Special attention was granted to big volume customers.
- Each case was individually analyzed and redesigned to improve meter efficiency
- Material was totally financed by the project
- Installation was undertaken by PDAM





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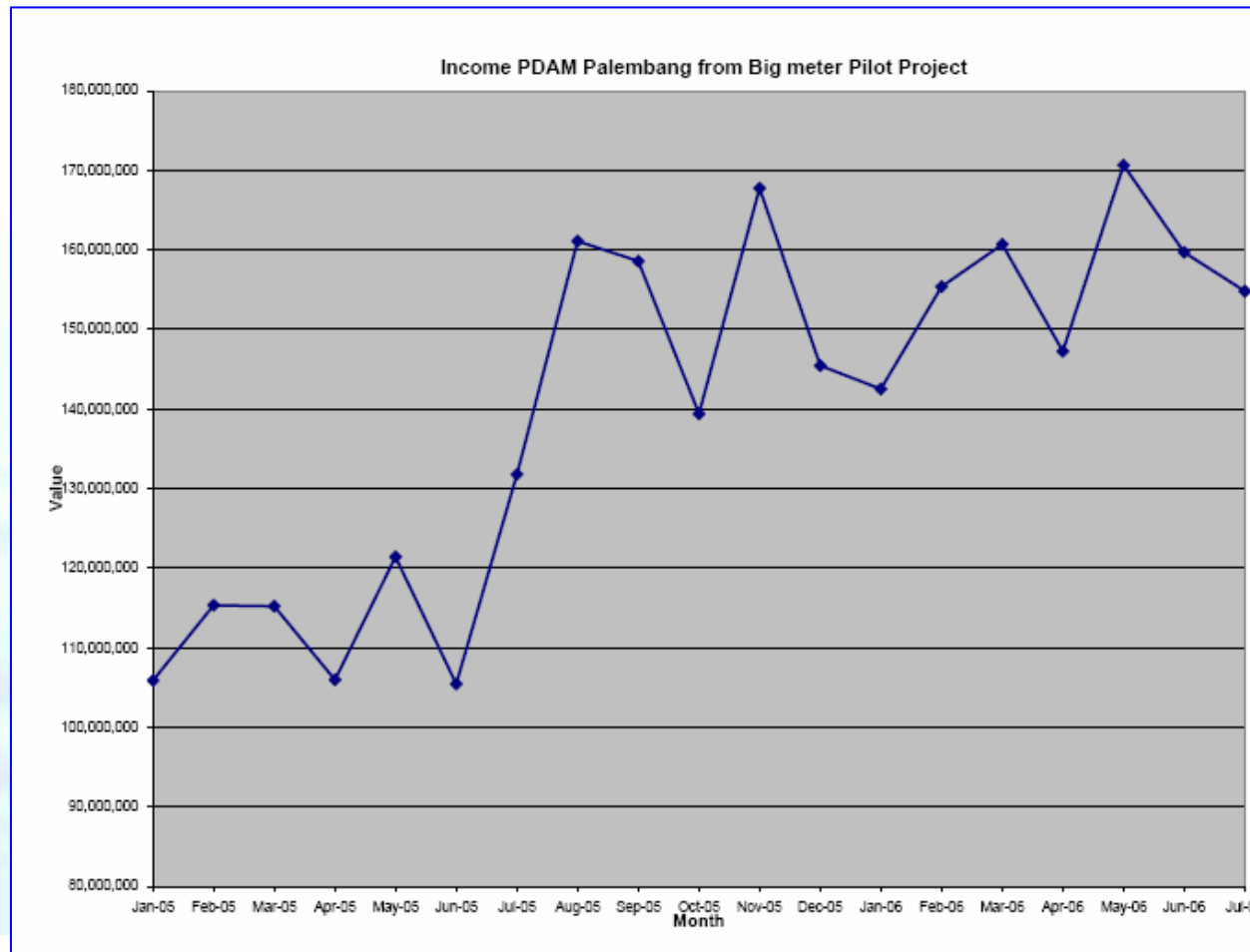
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**PDAM Palembang: 32% Progress on 5 pilot customer.  
Total Investment cost : about 75 M. Rps**

<b>Period</b>	<b>M3 sold</b>	<b>Extra V3</b>	<b>Extra Sales Rps</b>
Starting Month	19,056	0	0
Month 2	25,127	6,071.00	35,667,125.00
Month 3	27,352	8,296.00	48,739,000.00
Month 4	25,067	6,011.00	35,314,625.00
Month 5	29,407	10,351.00	60,812,125.00
Month 6	27,183	8,127.00	47,746,125.00
Month 7	26,353	7,297.00	42,869,875.00
Month 8	31,089	12,033.00	70,693,875.00
Month 9	29,364	10,308.00	60,559,500.00
Month 10	30,174	11,118.00	65,318,250.00
<b>Total</b>		<b>79,612.00</b>	<b>467,720,500.00</b>

# *Income progression for big meters PDAM Palembang*



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# Dissemination progress

- PDAM Palembang decided to immediately implement a special bulk meter strategy;
- Project training output were systematically applied;
- A special team was built
- About 80 locations were totally re-built, from PDAM budget

# A success story in Makassar : Indofood

- INDOFOOD actually requires about 10.000 M3 per month
- PDAM could only supply about 5.000 M3 per month,
- Several trial were undertaken unsuccessfully to increase volume;
- Indofood did not have alternative and drilled their own wells.
- 3 deep wells produce the required balance;
- Meaning extra electricity, chemical and operational cost to operate INDOFOOD own water processing unit.



# The supply and metering area were totally redesigned



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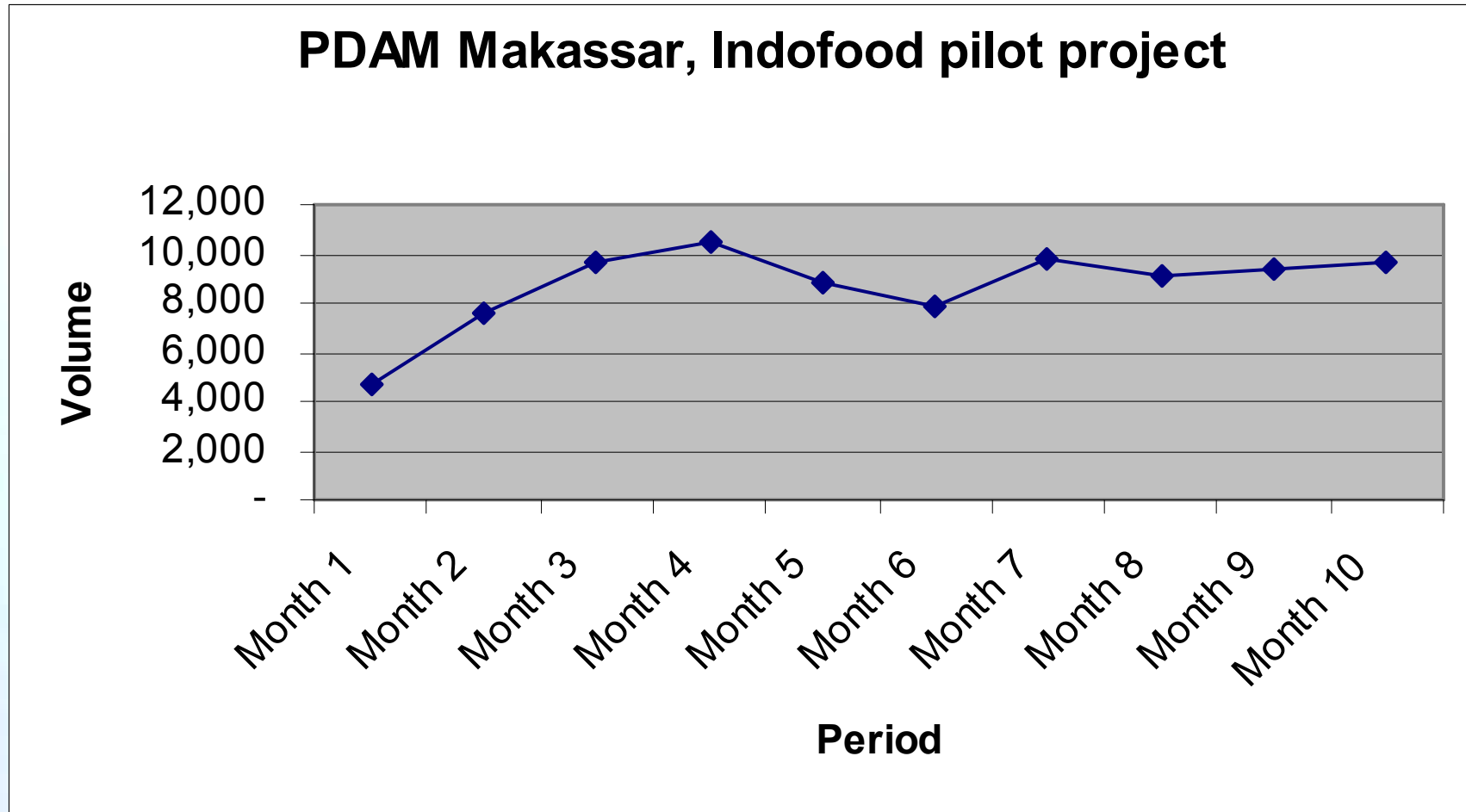
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# Progress analysis

Period	M3 sold	Extra V3	Billing in Rps	Extra Sales Rps
Month 1	4,758		59,475,000.00	
Month 2	7,538	2,780.00	94,225,000.00	34,750,000.00
Month 3	9,719	4,961.00	121,487,500.00	62,012,500.00
Month 4	10,442	5,684.00	130,525,000.00	71,050,000.00
Month 5	8,810	4,052.00	110,125,000.00	50,650,000.00
Month 6	7,839	3,081.00	97,987,500.00	38,512,500.00
Month 7	9,738	4,980.00	121,725,000.00	62,250,000.00
Month 8	9,080	4,322.00	113,500,000.00	54,025,000.00
Month 9	9,440	4,682.00	118,000,000.00	58,525,000.00
Month 10	9,697	4,939.00	121,212,500.00	61,737,500.00
Month 11	10,956		136,950,000.00	
Total		39,481.00		493,512,500.00

# Results are immediate .



*An example of return on investment : INDOFOOD  
Makassar*

<b>Description</b>	<b>Values are in Roupias</b>
Total investment cost	10,553,950.00
Cost of 1 M3 water sold	12,500.00
Initial Consumption in M3	5,000.00
Present Consumption in M3	10,000.00
Extra volume sold in M3	5,000.00
Extra income in Rps per month	62,500,000.00
Return in number of days	5.07



## *Dissemination actions: Internal*

- House connection pilot model is now systematically reproduced in all target PDAMs;
- Big meters strategy is systematically reproduced;
- HDPE pipes are now used instead of GIP pipes;
- Organization have been permanently adjusted to meet NRW strategy in Makassar and Palembang;
- PDAM Banjarmasin is using project procedures as basis for their S.O. P. / ISO 9001 QA/QC policy

## *Dissemination actions: External*

- PDAM Palembang and Makassar have started promoting their experiences to the surrounding PDAMs (Kabupaten) .
- PDAM Palembang has been requested to present their progress to several ASEAN events (Vietnam, Malaysia);
- Project was approached by several new PDAM and other donors (USAid)

# Next step

- To build on Euro promocap Iwat project actions, and with full support from Perpamsi, a proposal has been submitted to E.U. , under Asia Invest program, early March 2007, to
- Promote new partnerships with 10 more cities in Indonesia ,
- Promote Indonesia water sector as a leading body in ASEAN, by disseminating output in 5 other Asean cities.

# Conclusion

- N.R.W. requires a very deep involvement in the FIELD. It cannot be improved from the office;
- Training and capacity building is an absolute necessity, but academic training is prone to failure : N.A.T.O.
- When it comes to NRW, field staff should absolutely be the main training targets.
- Access to technology is available but should be used within an integrated strategy: It does not make sense to dream about Hi-Tech when network is not known!



# The Indonesian peculiarity

- Flexibility can be compensated by procedures and technical training;
- Special effort should be granted to promote at society level a “Water culture” and a “Water ethic”
- Should we think about promoting synergy between the several actors (PDAM, Mayors, ministries, Universities, NGOs)?

*Terima Kasih banyak, sampai jumpa  
lagi*



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# ***Euro Promocap Iwat project***



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***Make more with same , or make same with less***