

BANJARMASIN CITY

WATER AND SANITATION



Facts & Figures

The city is an island. Banjarmasin is completely encircled by a system of rivers, streams & canals.

PEOPLE & WATERWAYS

72,745

SLUM HOUSING UNITS ARE WITHIN 200 M OF WATERWAYS.

82%

OF RESIDENTIAL AREA IS WITHIN A 5 MINUTE WALK (400 M) OF WATERWAYS.

84%

OF THE CITY'S TOTAL AREA IS WITHIN 400 METERS OF WATERWAYS.

Banjarmasin is undergoing economic and social transformations due to urbanization and climate change. The city's rivers are both its lifeblood and create risk. Due to the city's isolated location and surrounding waterways, self-reliance is key to decreasing vulnerability in the face of these coming changes.

Banjarmasin
South Kalimantan
Indonesia



POPULATION

BY 2030, THE CITY IS EXPECTED TO NEARLY DOUBLE IN POPULATION TO OVER A MILLION, CAUSING EXTREME DISTRESS ON THE CAPACITY OF THE CITY'S RESOURCES, HOUSING, AND INFRASTRUCTURE.

720,000

BANJARMASIN, THE CAPITAL OF SOUTH KALIMANTAN, WAS FOUNDED IN 1526 FOR ITS PRIME RIVER TRADE LOCATION. THE CITY EXISTS ON A DELTA ISLAND.

9681.29 ha

THE CITY IS HOME TO SOME OF THE DENSEST URBAN SLUMS IN SOUTHEAST ASIA. RIVERFRONT SLUM AREAS ARE AMONGST THE MOST RAPIDLY DENSIFYING AREAS.

74.37 PERSONS / HECTARE

CLIMATE & HYDROLOGY

HAVING A TROPICAL RAINFORREST CLIMATE, THE CITY IS INUNDATED BY FLOODING DURING THE RAINY SEASON. THE DUTCH CONSTRUCTED EXTENSIVE CANAL SYSTEMS FOR DRAINAGE. HOWEVER THESE SYSTEMS ARE NOW ILL-MAINTAINED AND OUT OF DATE WITH CURRENT LAND USES.



120.2 KM

500 KM OF RIVERS AND CANALS COURSE THROUGH THE CITY, MAKING UP 8% OF LAND USE. THE CITY HAS EVOLVED AROUND ITS WATERS.

MOST OF THE CITY SITS -0.16 M BELOW AVERAGE SEA LEVEL, CAUSING THE RIVERS TO BECOME BRACKISH AND SALTY IN THE DRY SEASON DUE TO THE INTRUSION OF SEA WATER.

16 CM BELOW SEA LEVEL

VISION OF CITY SANITATION

Sanitation realize 50 AL, 90 PS, 90 DR and 100 AM Banjarmasin City in 2019

**AL : wastewater
PS : waste management
DR : drainage
AM : drinking water**





UNSTABLE BUILDING CONSTRUCTION

The urban poor are skillful at building homes over the water. However, homes are vulnerable due to a lack of high-quality materials or infrastructure and the constant need to raise homes because of flooding. During the dry season, fires ravage the wooden structures.

WATER QUALITY: TRASH & POLLUTION

The rivers have been contaminated by industrial pollution, build-up of urban waste and the elimination of a healthy river ecology.

INDUSTRY & HOUSEHOLDS
PRODUCE WASTE AT A RATE OF

300 TONS / DAY

BUT THE CITY ONLY HAS THE
GARBAGE MANAGEMENT CAPACITY
TO BRING TO THE LANDFILL

180 TONS / DAY

WHERE DOES THE REST
GO? **THE WATER.**

SANITATION & PUBLIC HEALTH

The urban poor are surrounded by rivers but lack access to potable water. Recent public health outbreaks are caused by waterborne bacteria. The city has no comprehensive utility system to reach the riverfront urban poor.

RECENT OUTBREAKS

E. COLI & CHOLERA

EROSION & SEDIMENTATION

The river embankments have eroded, increasing the number of homes over water. At the same time, the number of rivers has decreased from 72 to 61 in the last 5 years due to sedimentation and build-up of urban wastes. Channelization disrupts river's natural self-regulation.

RIVERS LOST
IN THE LAST
FIVE YEARS

11

FLOODING & RISING TIDES

Climate change and sedimentation have caused rising water levels across the city. During the rainy season, the city's estuaries, canals and municipal drainage are overloaded, flooding whole neighborhoods. The lack of adequate drainage infrastructure exacerbates public health issues and degrades built structures.

DAMAGED RIVER ECOLOGY

Water hyacinth has taken over the waterways. The plant, which thrives in polluted water bodies because it has a high capacity for uptake of heavy metals, will starve the water of oxygen and kill fish populations. However, hyacinth can be used to remediate contaminated water and harvested as a valuable ingredient for fertilizer.

Troubled Waters

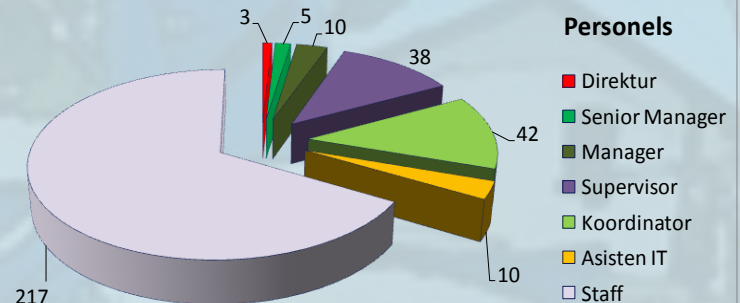
THE CITY'S SOLUTIONS TO THESE SYSTEMIC PROBLEMS ARE ONLY QUICK WINS. BANJARMASIN NEEDS SOLID, LONGER-TERM STRATEGIES.

Water Intake :

- Sungai Lulut
- Sungai Bilu
- Sungai Tabuk
- Riam Kanan Irrigation

3 Water Treatment Plants :

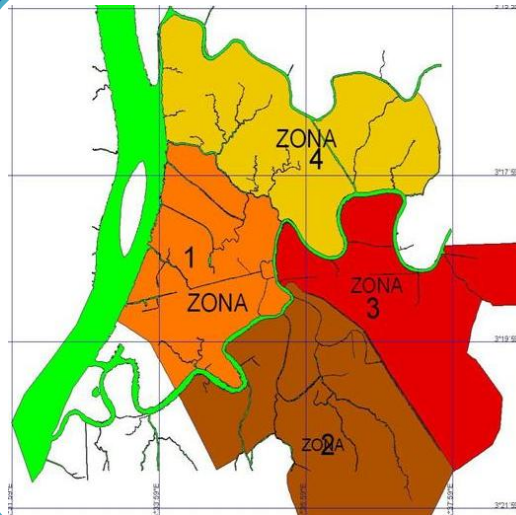
- IPA I A.Yani : 500 l/s
 - IPA II Pramuka : 1.000 l/s
 - Mini Treatment Plan
S.Lulut : 50 l/s
- Total 2.000 liter/s



PDAM BANDARMASIH

Reservoirs dan capacity :

- A. Yani : 5.000 m³
- IPA II Pramuka : 10.000m³
- *S. Parman : 2.500 m³
- *S.Lulut : 200m³
- *Banua Anyar : 2.500m³
- *Gerilya : 2.500 m³



The challenges:

Raw water supply
Production capacity
System reliability
The rate of water loss
Customer service

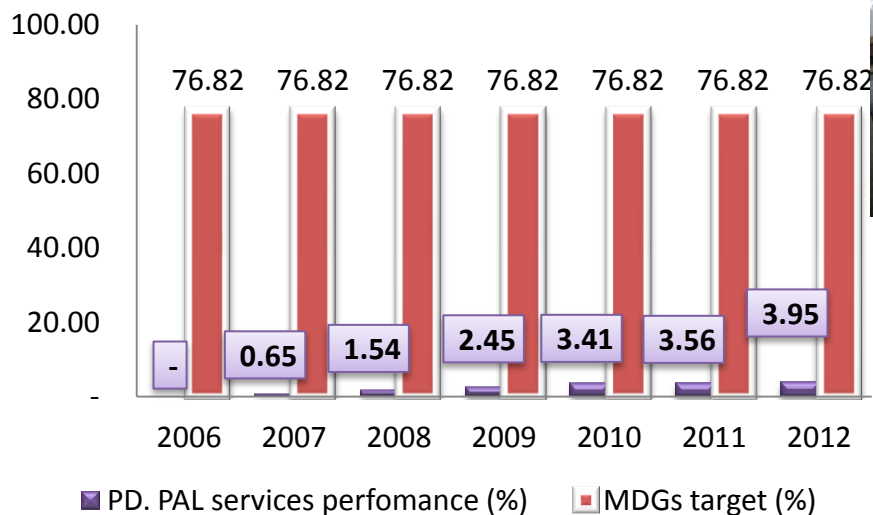


DEVELOPMENT OF PDAM BANDARMASIH 2000-2012

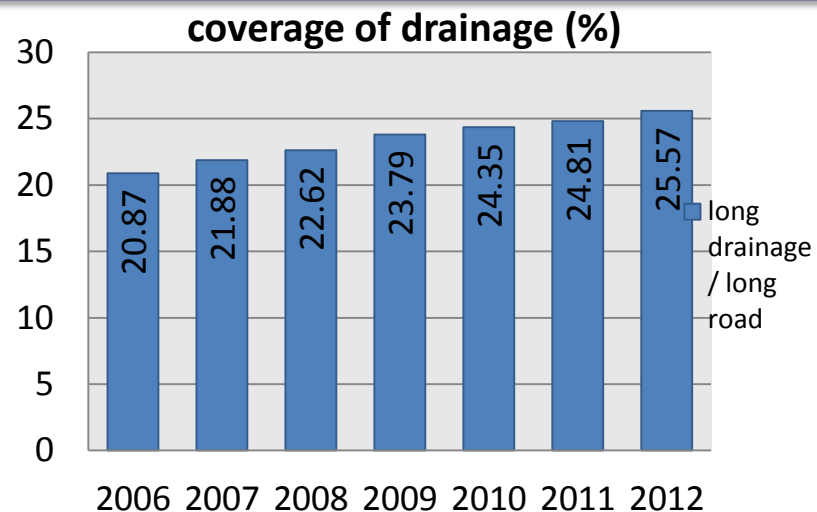
No.	Information	2000	2001	2004	2010	2011	2012
1.	Inhabitants	565.000	569.875	606.405	665.267	645.305	658.344
2.	Service Coverage	58%	68 %	77 %	98,53 %	92,90 %	97,91 %
3.	Number of connections	48.791	58.914	77.920	122.179	131.098	139.381
4.	Population served	327.700	386.261	480.042	655.474	599.500	644.610
5.	Installed capacity (l/s)	1.071	1.071	1.071	1.490	1.490	2.100
6.	Continuity of distribution in 24h	60%	71 %	94 %	97	97 %	100 %
7.	Profit/Loss (Billion Rp.)	-(5.348)	-(3,596)	1,365	4,523	5.580	5.921
8.	Water loss (%)	33.18	30,97	29,88	28,93	26,27	26,19
9.	Operation ratio	79 %	92 %	103 %	97 %	97 %	97 %
10.	Total Assets (Billion Rp.)	98	110	164	397,75	405,29	453,63

development of sanitation banjarmasin

wastewater sector development

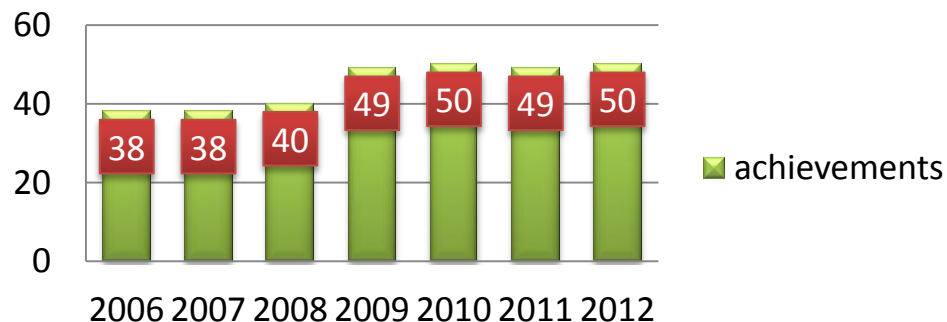


drainage sector development



the waste sector development

waste transportation services (%)



SOURCES OF WATER POLLUTION

Households



51 %

Industries



47 %

Agriculture
/Fisheries



2 %

Rank of Corporate Performance Assessment Programs in Environmental Management



2010 - 2011

2

1

-

2011 - 2012

5

1

2

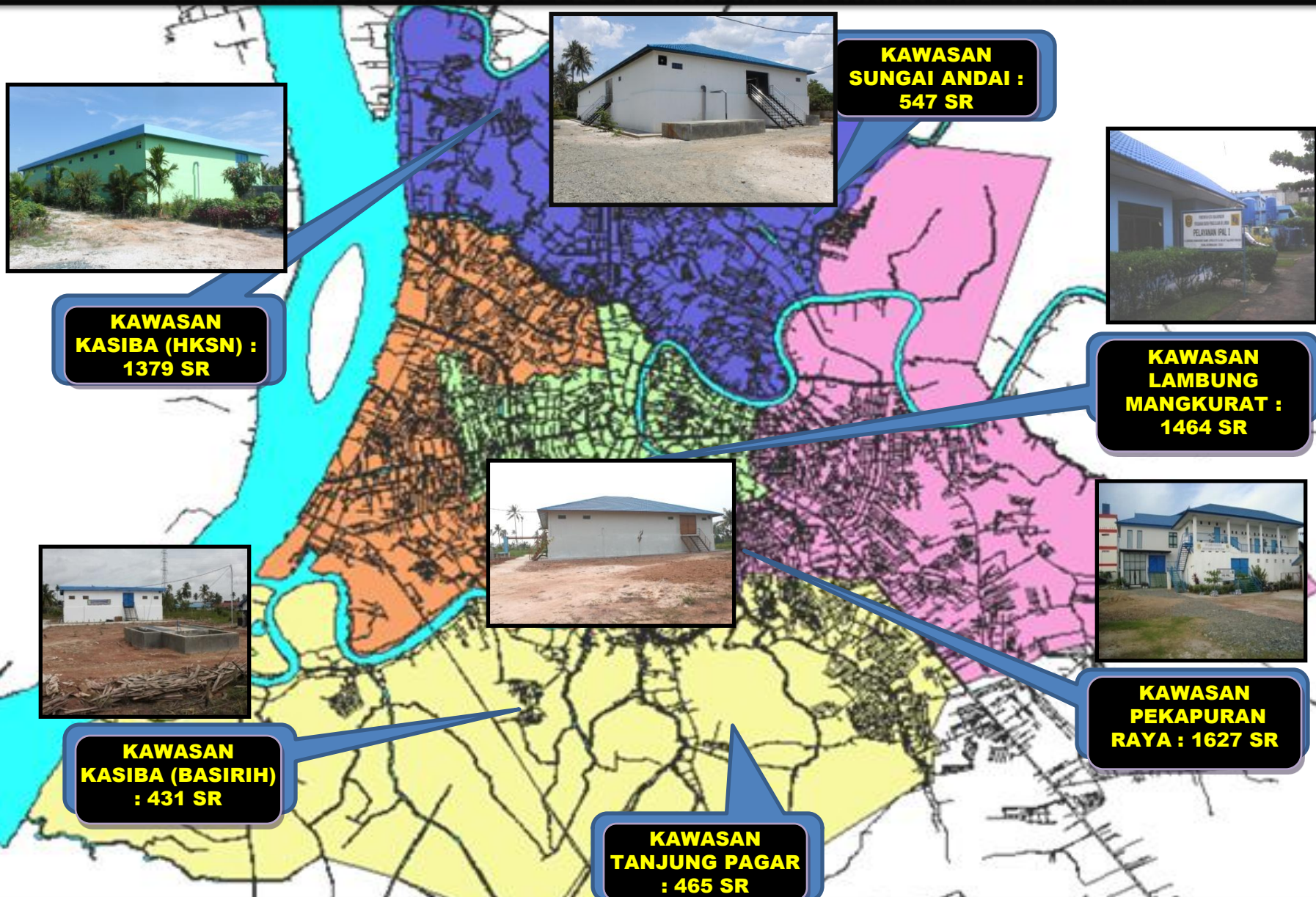
2012 - 2013

9

1

-

CITY WASTEWATER TREATMENT COMPANY (PD.PAL)



SERCIVE COVERAGE : 4,14 % (3RD QUARTERLY DATA - YEAR 2013)

STRUCTURAL ORGANIZATION



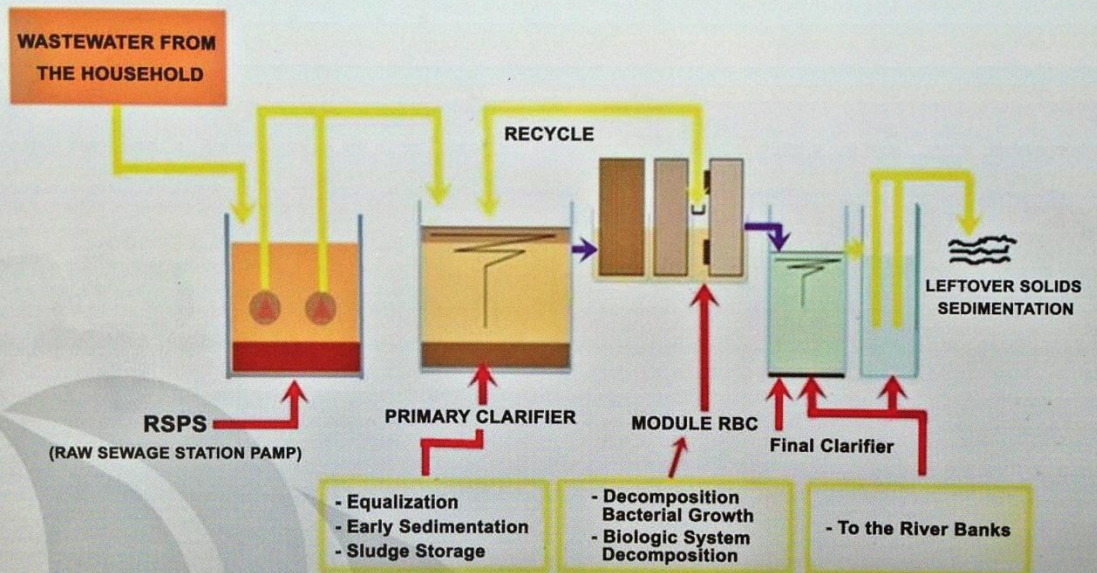
Wastewater Management Installation (WMI)

- WMI Lambung Mangkurat (1.000 m³/day)
- WMI Pekapuran Raya (2.500 m³/day)
- WMI HKS N (5.000 m³/day)
- WMI Basirih (2.000 m³/day)
- WMI Tanjung Pagar (2.000 m³/day)
- WMI Sungai Andai (3000 m³/day)
- WMI Sultan Adam (Development Phase)

CHALLENGES

- Lack of awareness by the citizen
- Lack of knowledge by the citizen about standard septic tank
- Lack of law enforcement

WASTEWATER MANAGEMENT PROCESS (RBC SYSTEM)



BANJARMASIN'S WASTEWATER MANAGEMENT INSTALLATIONS DEVELOPMENT

NO.	WASTEWATER MANAGEMENT INSTALLATION (WMI)		INSTALLED CAPACITY (m ³ /day)	USED CAPACITY (m ³ /day)	UNUSED CAPACITY	HOUSE JOINT
0	1		4	5	6	7
1	WMI LAMBUNG MANGKURAT		1.000	443	1.359	50
2	WMI PEKAPURAN RAYA		2.500	534	1966	1617
3	WMI HASAN BASRY		5.000	358	4.642	1.103
4	WMI BASIRIH		2.000	134	1.866	429
5	WMI TANJUNG PAGAR		2.000	10	1.990	32
6	WMI SUNGAI ANDAI		3.000	-	3.000	-
7	WMI SULTAN ADAM (DEVELOPMENT PHASE)		-	-	-	-

End of Presentation

