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 M 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.

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.

Banjarmasin, the capital of South Kalimantan, was founded in 1525 for its prime river trade location. The city is exists on a delta island.

The city is home to some of the densest urban slums in Southeast Asia. Riverfront slum areas are amongst the most rapidly densifying areas.

720,000
79681.29 ha
74.37 PERSONS PER HECTARE

CLIMATE & HYDROLOGY

Having a tropical rainforest 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 However, these systems are now ill-maintained and out of date with current land uses.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
Troubled Waters

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.

**UNSTABLE BUILDING CONSTRUCTION**

**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.

**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.

**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.

**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 ECOSYSTEM**

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.

**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.**

**RECENT OUTBREAKS E.COLI & CHOLERA**

**RIVERS LOST IN THE LAST FIVE YEARS 11**

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

- A. Yani: 5,000 m³
- IPA II Pramuka: 10,000 m³
- S. Parman: 2,500 m³
- S. Lulut: 200 m³
- Banua Anyar: 2,500 m³
- Gerilya: 2,500 m³

Water Intake:

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

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

The challenges:

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

Personels:

- Direktur
- Senior Manager
- Manager
- Supervisor
- Koordinator
- Asisten IT
- Staff

PDAM BANDARMASIH
<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>1.</td>
<td>Inhabitants</td>
<td>565.000</td>
<td>569.875</td>
<td>606.405</td>
<td>665.267</td>
<td>645.305</td>
<td>658.344</td>
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<tr>
<td>2.</td>
<td>Service Coverage</td>
<td>58%</td>
<td>68%</td>
<td>77%</td>
<td>98.53%</td>
<td>92.90%</td>
<td>97.91%</td>
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<tr>
<td>3.</td>
<td>Number of connections</td>
<td>48.791</td>
<td>58.914</td>
<td>77.920</td>
<td>122.179</td>
<td>131.098</td>
<td>139.381</td>
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<tr>
<td>4.</td>
<td>Population served</td>
<td>327.700</td>
<td>386.261</td>
<td>480.042</td>
<td>655.474</td>
<td>599.500</td>
<td>644.610</td>
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<tr>
<td>5.</td>
<td>Installed capacity (l/s)</td>
<td>1.071</td>
<td>1.071</td>
<td>1.071</td>
<td>1.490</td>
<td>1.490</td>
<td>2.100</td>
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<tr>
<td>6.</td>
<td>Continuity of distribution in 24h</td>
<td>60%</td>
<td>71%</td>
<td>94%</td>
<td>97</td>
<td>97%</td>
<td>100%</td>
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<tr>
<td>7.</td>
<td>Profit/Loss (Billion Rp.)</td>
<td>-(5.348)</td>
<td>-(3,596)</td>
<td>1,365</td>
<td>4,523</td>
<td>5.580</td>
<td>5.921</td>
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<tr>
<td>9.</td>
<td>Operation ratio</td>
<td>79%</td>
<td>92%</td>
<td>103%</td>
<td>97%</td>
<td>97%</td>
<td>97%</td>
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<tr>
<td>10.</td>
<td>Total Assets (Billion Rp.)</td>
<td>98</td>
<td>110</td>
<td>164</td>
<td>397.75</td>
<td>405.29</td>
<td>453.63</td>
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development of sanitation banjarmasin

wastewater sector development

<table>
<thead>
<tr>
<th>Year</th>
<th>MDGs target (%)</th>
<th>PD. PAL services performance (%)</th>
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<tbody>
<tr>
<td>2006</td>
<td>76.82</td>
<td>-</td>
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<tr>
<td>2007</td>
<td>76.82</td>
<td>0.65</td>
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<tr>
<td>2008</td>
<td>76.82</td>
<td>1.54</td>
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<tr>
<td>2009</td>
<td>76.82</td>
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<tr>
<td>2010</td>
<td>76.82</td>
<td>3.41</td>
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<tr>
<td>2011</td>
<td>76.82</td>
<td>3.56</td>
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<tr>
<td>2012</td>
<td>76.82</td>
<td>3.95</td>
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</tbody>
</table>

drainage sector development

coverage of drainage (%)

- 2006: 20.87
- 2007: 21.88
- 2008: 22.62
- 2009: 23.79
- 2010: 24.35
- 2011: 24.81
- 2012: 25.57

the waste sector development

waste transportation services (%)

- 2006: 38
- 2007: 38
- 2008: 40
- 2009: 49
- 2010: 50
- 2011: 49
- 2012: 50

achievements
SOURCES OF WATER POLLUTION

Households: 51%
Industries: 47%
Agriculture/Fisheries: 2%

Source: Banjarmasin Environmental Agency
<table>
<thead>
<tr>
<th>Year Range</th>
<th>Rank 1</th>
<th>Rank 2</th>
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<td>2010 - 2011</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>2011 - 2012</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>2012 - 2013</td>
<td>9</td>
<td>1</td>
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</table>

Source: Banjarmasin Environmental Agency
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)

- Wastewater from the household
- Recycle
- Leftover solids sedimentation

Wastewater Management Installation (WMI)

- WMI Lambung Mangkurat (1,000 m³/day)
- WMI Pekapuran Raya (2,500 m³/day)
- WMI HKN (5,000 m³/day)
- WMI Basirih (2,000 m³/day)
- WMI Tanjung Pagar (2,000 m³/day)
- WMI Sungai Andai (3,000 m³/day)
- WMI Sulatan Adam (Development Phase)
# Banjarmasin’s Wastewater Management Installations Development

<table>
<thead>
<tr>
<th>NO.</th>
<th>Wastewater Management Installation (WMI)</th>
<th>Installed Capacity (m³/day)</th>
<th>Used Capacity (m³/day)</th>
<th>Unused Capacity (m³/day)</th>
<th>House Joint</th>
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<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
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<tr>
<td>1</td>
<td>WMI Lambung Mangkurat</td>
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<td>443</td>
<td>1.359</td>
<td>50</td>
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<td>2</td>
<td>WMI Pekapurau Rayा</td>
<td>2.500</td>
<td>534</td>
<td>1966</td>
<td>1617</td>
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<td>3</td>
<td>WMI Hasan Basry</td>
<td>5.000</td>
<td>358</td>
<td>4.642</td>
<td>1.103</td>
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<tr>
<td>4</td>
<td>WMI Basirih</td>
<td>2.000</td>
<td>134</td>
<td>1.866</td>
<td>429</td>
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<tr>
<td>5</td>
<td>WMI Tanjung Pagar</td>
<td>2.000</td>
<td>10</td>
<td>1.990</td>
<td>32</td>
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<tr>
<td>6</td>
<td>WMI Sungai Andai</td>
<td>3.000</td>
<td>-</td>
<td>3.000</td>
<td>-</td>
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<tr>
<td>7</td>
<td>WMI Sultan Adam (Development Phase)</td>
<td>-</td>
<td>-</td>
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End of Presentation