

Design Challenge

RIO Urban Water

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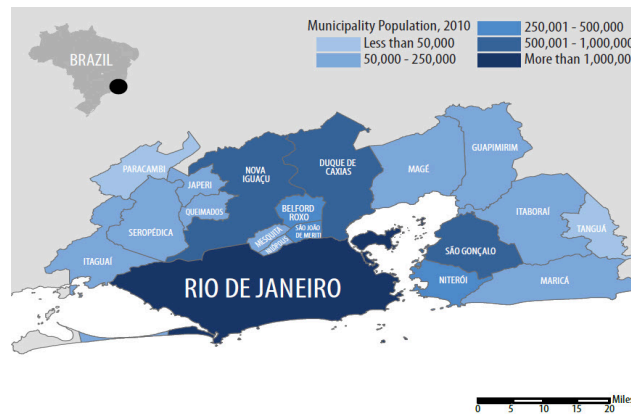
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Water



- ≈ Brazil has vast water resources, but poorly distributed to the urban population
 - ~ 12% of total fresh water in the world is in Brazil (69% on the Amazon Rainforest)
- ≈ Rio is the second largest city in Brazil with 11.5 mi people living in the metropolitan area
- ≈ Rio has an above-average water consumption rate
 - ~ 253 L/person/day (52% above the Country's average)
- ≈ High water system leakages
 - ~ 58% of its water is lost by leakages
 - ~ 15% loss by illegal connections



Water Supply



- ≈ Critical drought season (2014-2015)
- ≈ Strong hydric stress in the River Basin of Paraíba do Sul
- ≈ Most of the water supply to the metropolitan area of Rio de Janeiro depends on Paraíba do Sul River
- ≈ All reservoirs from in the River Basin of Paraíba do Sul are drastically below their capacity and operating at reduced flow
- ≈ In August 2015, Paraibuna Reservoir levels reached 1.7%
- ≈ Water shortages and temporary reduction in water flow



Sanitation



- ≈ 1944 - Guanabara Bay Depollution Programme
- ≈ Population with access to sanitation:
 - ~ 77% of wastewater is collection
 - ~ 51% of generated wastewater is treated
 - ~ Untreated wastewater is discharged directly in the Guanabara Bay

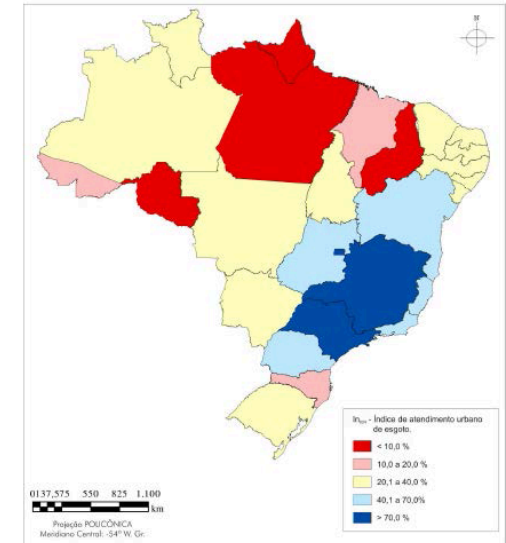


Sanitation



≈ Sanitation challenges are a huge

- ~ Impossibility to implement sewer pipes.
- ~ Difficulty of connections and obstacles to provide service
- ~ Increasing number of peripheries and irregular occupations



Flood and Landslides



≈ Impermeability of urban soil

≈ canalization of rivers and streams, and failure in the maintenance and conservation of municipal water streams, which are points of outflow of rainwater

≈ Excessive earthmoving exposing soil to erosion

≈ Urban sprawl

≈ Lack of control and monitoring of floods

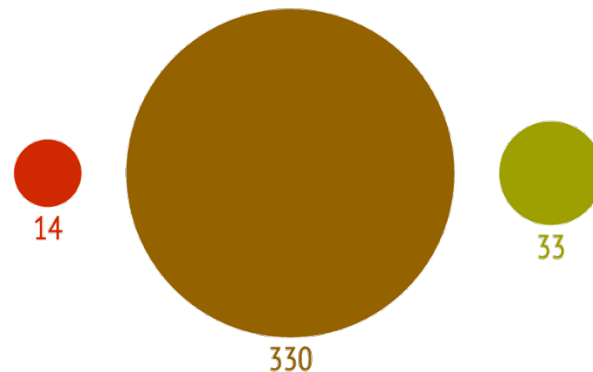
≈ Rio's topography together with heavy rain and irregular occupation by the population





Solid Waste

- ≈ 1.6 kg solid waste/person/day
- ≈ Over 300 ton solid waste/day reaches Guanabara Bay
- ≈ Waste collection services in parts of the city, but high density-slum areas do not receive waste collection services
- ≈ Sanitary landfills (recyclable or not)
- ≈ Failure to dispose of household hazardous waste and chemical and pharmaceutical waste separately from regular municipal waste
- ≈ Fairly low recycling rate (<5%)



● Trash caught by 11 barriers ● Trash that reaches the bay ● Trash collected by boats



Opportunities



Water Supply



- 1 SIN Acari
- 2 SIN Guandu
- 3 SIN Imunana-Laranjal
- 4 SIN Ribeirão das Lajes

