Developing the Urban Water System towards using the Paranoá Lake in Brasília as Receptor and Water Resource

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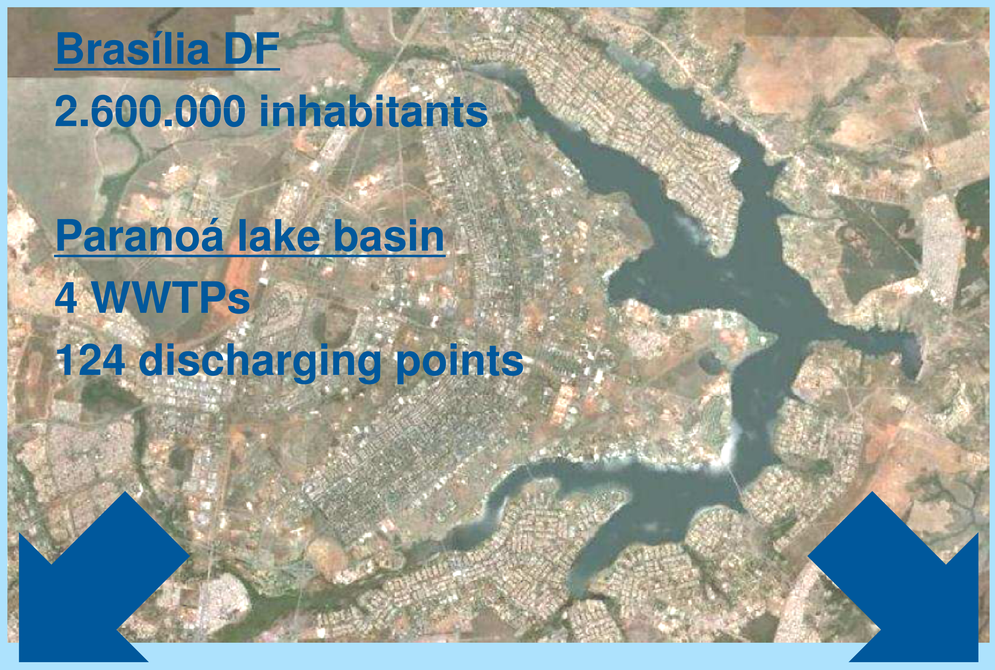
CHALLENGES

- Water shortage in the coming years due to e.g. accelerated urban growth and extreme climatic conditions
- Using the Paranoá lake as an additional water resource
- Four waste water treatment plants (WWTPs) in the Paranoá lake basin and
- Undefined pollutants loads from discharging points (urban areas runoff and mis-connections of the storm water system)

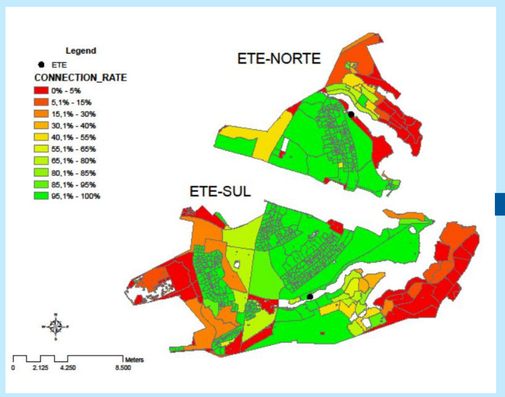


OBJECTIVE

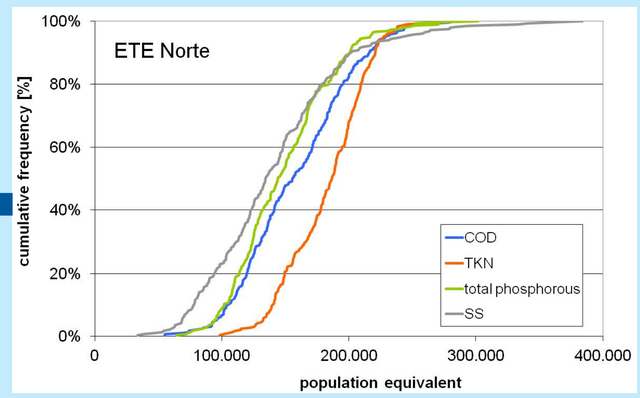
- Identification of the pollution load from diffuse (identify risk areas) and point sources (evaluation of the wastewater treatment plants performance)
- Reduction of the pollution load from diffuse and point sources (advanced waste water treatment techniques – pilot plant)

DIFFUSE SOURCES and RISK AREAS

- Couple census-data from 2000 and 2010 (e.g. connection rate to WWTP) with the actual pollution load of the WWTPs within the Paranoá lake basin
- Difference between census and evaluation of WWTPs indicates the amount of the diffuse pollution load and the changes between 2000 and 2010

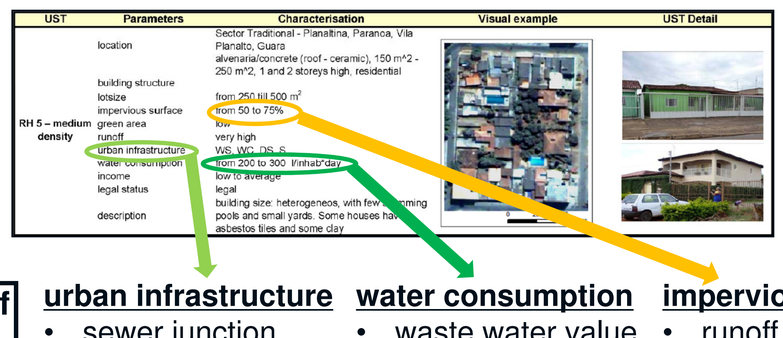


Census 2000: connection rate within Paranoá lake basin



Cumulative frequency of the population equivalent of WWTP 'ETE Norte'

- Couple urban structure types (UST) with census and evaluation of WWTPs
- Identification of risk areas with a high diffuse pollution potential



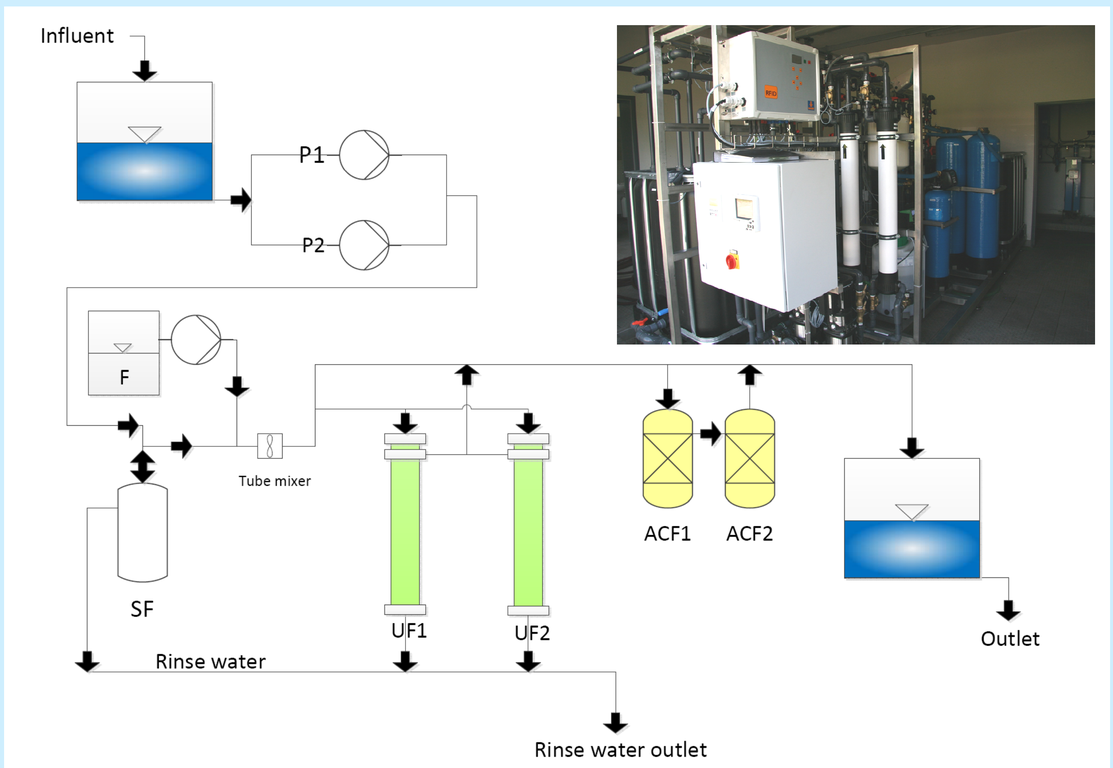
examples of UST data	urban infrastructure	water consumption	impervious surface
	• sewer junction • ceptic tanks	• waste water value	• runoff • percolation surface
waste water parameter	connection rate population equivalent	effluent value mis-connections	percolation potencial

Simplified approach of the couple of UST and waste water parameters

- Identification of pollution-relevant surface types and areas in order to develop effective measures and an integrated management
- Development of strategies for sewer management systems, sewer maintenance and optimization of the WWTP processes and operation

POINT SOURCES and PILOT PLANT

- WWTPs performance indicates good efficiencies for nutrient removal
- Advanced treatment techniques with a special attention to removal of micro-pollutants such as pesticides, pharmaceuticals and personal care products
- Conceptioning of a pilot plant with ultrafiltration (UF) and activated carbon filter (ACF) for the final effluent of the WWTP 'ETE Sul' in Brasília



Simplified flow scheme of the pilot plant and picture of the pilot plant

- Sand filter **(SF)** to safeguard the subsequent units
- Dosage of flocculent **(F)** for better filtration aspects
- Ultrafiltration **(UF)** to retain remaining suspended solids
- Activated-carbon filter **(ACF)** to remove micro-pollutants

- Testing and optimizing of the pilot plant under local waste water conditions on a WWTP in Germany in order to receive reference data
- Implementation of the pilot plant on the WWTP 'ETE Sul' to evaluate the removal of mirco-pollutants

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