Assessment of Irrigation Water Use through Groundwater Extraction in the Semiarid Northeast of Brazil

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Project: Geoecology III

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in Iguatu, CE, Brazil

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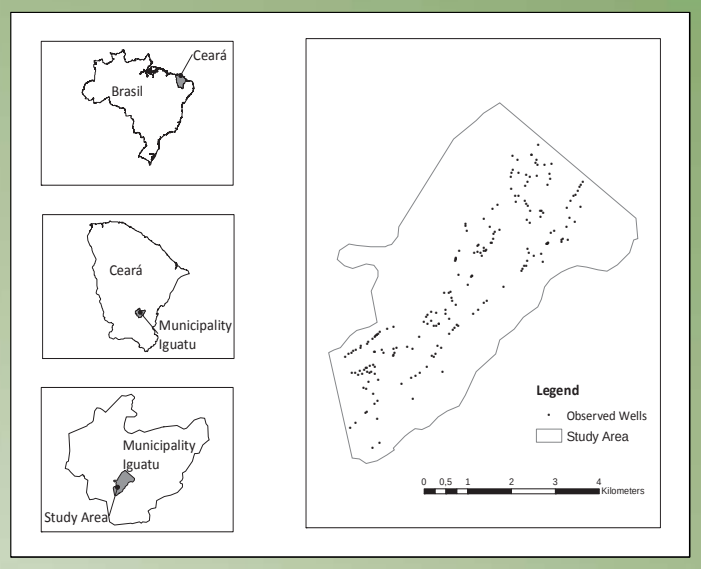
Introduction

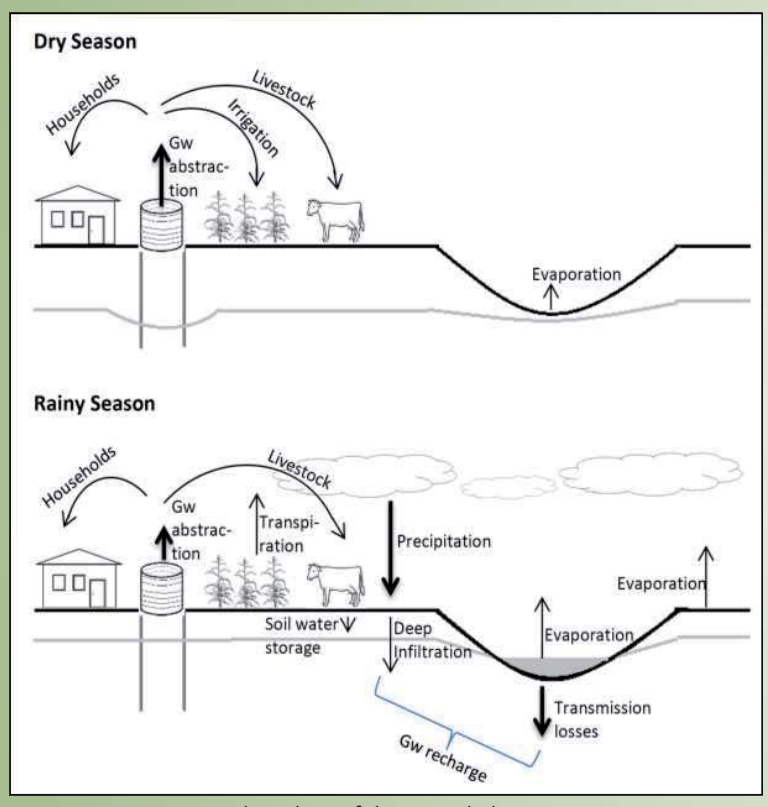
- Semiarid climate: Low precipitation and high evapotranspiration lead to water scarcity
- Ceará: Water for irrigated agriculture is supplied at 56 % by surface reservoirs and 44% by groundwater abstraction
- Objective: Quantify and analyze the alluvial groundwater extraction in the study area
- Pump and demand based calculation
- Water balance of groundwater withdrawal and recharge

Typical landuse: Banana and cattle

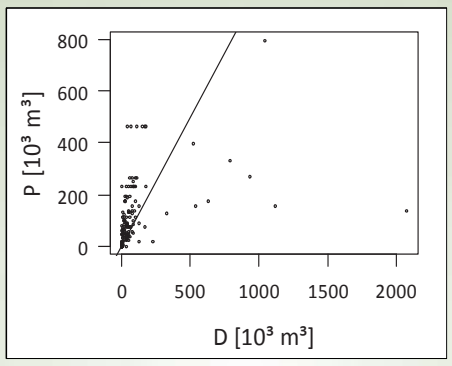
The observed river reach in the dry season



Location of the study area



Flow-chart of the water balance



Pump based (P) and demand based (D) calculation

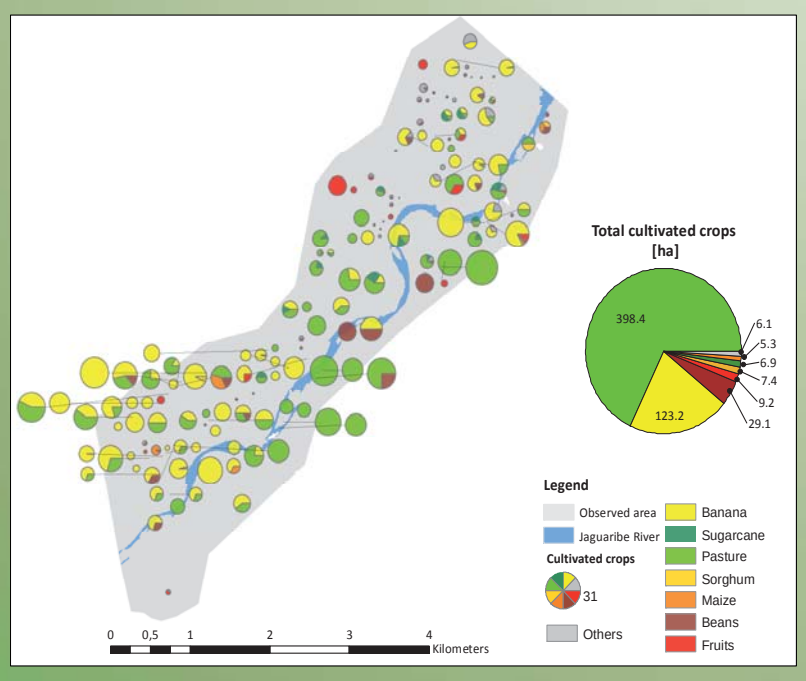
Methods

- Investigation of 14.5 km²; 200 wells in the alluvium of the river Jaguaribe near Iguatu
- Interviews about qualitative and quantitative aspects of water use
  - crop, cultivated area, irrigation system
  - Pump capacity, pumping hours per day
- Measurement of depth to water table

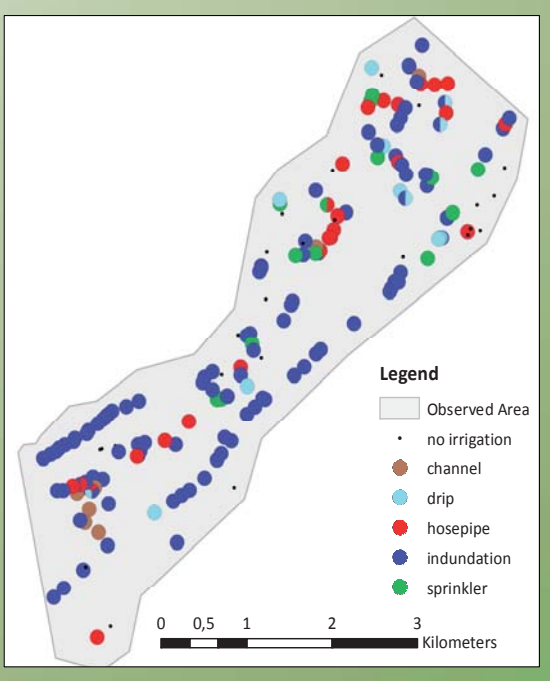
Different well types

Results

- Most wells are shallow
- Mainly applied irrigation method is inundation
- Irrigated acreage covers 40 % of the study area
- Most important crops: Pasture as food for cattle, banana
- 97.6 % of the abstracted water is used for irrigation
- 99.4 % of the groundwater extraction occurs in the dry season
- Pump based calculation exceeds demand based, difference: 15.5 %
- Groundwater recharge from precipitation is much lower than infiltration to the alluvium from the river



The cultivated crops in the study area



The applied irrigation systems

References:

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