MANAGED AQUIFER RECHARGE (MAR) AS PART OF INTEGRATED WATER RESOURCES MANAGEMENT (IWRM) IN NORTHEAST BRAZIL – OBJECTIVES AND METHODOLOGY

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SUMMARY

Northeast Brazil faces numerous challenges when it comes to water resources. The semi-arid inland suffers from increasing drought periods, while the tropical coastal area receives rainfall in abundance during its several months of wet season. However, these vast water quantities can only be stored in the region to a limited extend. High agricultural land use with irrigation (sugar cane) and quick population growth increase the pressure on the local groundwater system. Sustainable management of the water resources is urgently required but hindered by a very bad data situation.

The study aims at establishing a complete water resources system analysis for the case study area of João Pessoa, including budgets of water availability and demand on a spatio-temporal distribution. The hypothesis is that the implementation of an MAR (Managed Aquifer Recharge) system will increase the coastal agricultural and urban area's resilience towards dry periods and improve the groundwater resources sustainability.

Results show there is a high spatial and temporal discordance of water availability and demand in the study area. Without proper storage of water surpluses during the rainy season, the deficits during the dry season can only be satisfied at cost of the groundwater resources, leading to a depletion in groundwater levels over time. Natural groundwater recharge proves, based on the available calculated data, insufficient in the long run. It can be increased via a decentralized MAR system, which ultimately will increase the system's resilience and help sustain local groundwater resources. It must be noted that the overall poor data situation remains a vast problem for any water management in the region and lots of assumptions