

## **HOW TO FACE GROUNDWATER SALINIZATION AND CONTAMINATION UNDER GLOBAL ENVIRONMENTAL CHANGE IN ITS SOCIETAL CONTEXT: CHALLENGE OF WATER QUALITY IN THE URBAN ENVIRONMENT OF RECIFE (BRAZIL)**

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**Abstract.** *Due to an increasing demographic pressure, the Metropolitan Region of Recife (RMR) went through remarkable water and land use changes over the last decades. These evolutions gave rise to numerous environmental consequences, such as a dramatic decline of the aquifer potentiometric levels, groundwater salinization and contamination. This degradation of natural resources is linked to the increase of water demand, punctually amplified by drought periods which induced the construction of thousands of private wells, hindering global political solutions. The RMR thus appears as a typical "hot spot" illustrating the problems of emerging countries such as urbanization, unequal distribution of wealth, limited effects of political decisions, rapid industrial and touristic developments. All these factors induce high pressures on water resources both on quantity and quality in the context of global social and environmental changes. Under these conditions, the COQUEIRAL research project proposes an interdisciplinary investigation program aiming to study the human impact on coastal overexploited aquifers. The project is structured in three principal converging axes: (1) the analysis of pressures on the groundwater resources and their societal and structural reasons; (2) the identification of sources and mechanisms of groundwater quality and quantity degradation, focusing on the physical and chemical processes as vectors of the reaction of the system to the external pressures; and (3) the assessment of the regional impact of global changes on water resources. This project approaches the degradation of the groundwater resources by questioning the specific conditions of urbanization and water administration in Recife at multiple levels: (1) the macro-sociological level with the political and institutional stake of water management; (2) the meso-sociological level with the water's collective stakes and their perceptions; and (3) the micro-sociological level, meaning the representations, practices, individual and collective uses of water. Geomorphological-urban maps will complete the knowledge. In parallel to the acquisition of new geological, hydrological and hydrogeological data, the objective is to elaborate methods to determine the origin and processes of salinization, including a multi-tracer approach, to identify sources and pathways of inorganic contamination and to determine the residence time of water within the aquifers.*

**Keywords:** groundwater salinization, societal context, geochemistry, isotope