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Strengthening coastal aquifer resilience and groundwater use against climate change effects and anthropogenic dynamics in the caribbean coast of Colombia: Case of the arroyo grande aquifer**Dayana Carolina Chala Diaz***Universidad de Cartagena, Colombia*

Humans, by nature, tend to take advantage of resources that are readily available and economically exploitable. The last principle, however, has not been applied to the case of groundwater resources in Colombia, with a potential supply of groundwater up to 5,848 km³ and a deficit in the resource management especially in the coastal regions. Currently, there is a lack of information on the groundwater vulnerability to the effects of climate change and overexploitation in the Colombian Caribbean Region. The quality and quantity of coastal aquifers are decreasing. Plans to protect aquifers are not developed yet and consequently, the coastal communities continue decreasing their strength and ability to improve living conditions.

This study focuses on the development of a hydrogeological and environmental profile of the Arroyo Grande Coastal aquifer as a strategy to strengthen the aquifers resilience and groundwater use. The aquifer serves five municipalities and has the potential to serve the City of Cartagena. However, due to the lack of information and the discrepancies of the existing data, the water quality, quantity and vulnerability to salinity intrusion is unclear.

The hydrogeological profile includes an appropriate delimitation of the study area, identification of the hydrogeological behavior, state of the environment, and an appropriate assessment of the impacts of possible effects of climate change and anthropogenic dynamics, through simulations in laboratory and mathematical models. This profile sets a precedent that can be replicated at the 30 aquifer systems distributed in the Colombian Caribbean Region, with a low sustainability index for the groundwater (0.47), compared to resource potential. Additionally, the importance of strengthening the social awareness about the groundwater use, the training of local qualified specialists' in the groundwater analyses, and continuously developing studies to reduce uncertainties related to the dynamics of the subterranean resource are discussed.

Biography

Dayana Chalá is a doctoral candidate in the Doctoral program of engineering focused on renewable energy and sustainability from the University of Cartagena, Colombia. She received her B.Eng (2016) in Civil Engineering from the University of Cartagena. In her Ph.D. she works developing numerical models to simulate solute transport processes in coastal aquifers. During her doctoral program, she is involved in two projects related to groundwater. One focused on the study of the hydrogeology and environmental conditions of the Arroyo Grande coastal aquifer in Cartagena, Colombia, and the other on the design and construction of experimental setups to simulate two dimensional dynamics of coastal aquifers. During her Ph.D. she has worked with Toronto Metropolitan University, Canada under the scholarship of Queen Elizabeth Advanced Scholars and the Emerging leaders of the Americas program. She continues to work under the supervision of professors from TMU, University of Cartagena, and University of Leeds.