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Managed Artificial Recharge in Jamaica- A Case Study

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Abstract

The Managed Artificial Recharge Facility in Innswood, St. Catherine is the largest artificial recharge facility in the Caribbean. It was conceptualized based on studies completed in 1982 by the then-Underground Water Authority, and was completed in 2017 by the National Water Commission and Rural Water Supply Limited. The facility's purpose is to provide direct recharge of the underlying Limestone Aquifer to mitigate against the observed impacts of saline intrusion due to over-pumping and sea level rise. There is currently a moratorium on new abstractions in this limestone aquifer because of these impacts, and one of the goals for the MAR Facility is to provide sufficient and continuous recharge to the aquifer in order to ease the existing moratorium.

The MAR's designed capacity is 5 million imperial gallons per day. To facilitate its operations, water is diverted from a nearby irrigation canal into four sedimentation basins to remove any suspended particles, and then the overflow from these basins flows into a series of wetlands/reed beds to filter any other contaminants which may be present in the water. The treated water is collected in an outflow sump, and then flows via pipes to a series of sinkholes and injection wells where the water enters the aquifer for storage and eventual restoration of water quality and retreat of the saline intrusion. The underlying issue of saline intrusion and water abstraction restrictions in this region is a very pressing issue, as there is significant residential growth in the area and a subsequent significant increase in water demand for domestic and other usages. While the MAR is a significant potential solution to the question "How can we sustainably provide water for this area without further deterioration of water quantity and quality?" routine monitoring is required to assess the facility's intended impact. Previous and ongoing assessments of the MAR's input is crucial for any similar infrastructural construction in the future.

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