Investigating the Extent of Saltwater Intrusion in the Coastal Aquifers of Sanga-Sanga Island, Tawi-Tawi

ABSTRACT

Saltwater intrusion (SWI) is a common issue in coastal groundwater systems, where seawater encroaches into freshwater zones, leading to elevated salinity levels. In Sanga-Sanga Island, Tawi-Tawi, limited access to water services has resulted in a heavy reliance on groundwater for domestic use. However, elevated salinity levels have been reported in several wells. Despite the growing concern over groundwater salinity, limited information is available on the extent of seawater intrusion and the factors influencing its occurrence on the island. To address this gap, this study aims to evaluate the extent of saltwater intrusion in the freshwater lens of Sanga-Sanga Island. Chloride concentrations will be measured as the primary indicator of saltwater intrusion, and the results will be used to delineate affected areas and assess the severity of SWI. In addition, an integrated conceptual model incorporating hydrogeochemical data, hydrogeological records, hydrometeorological conditions, and groundwater pumping information will be developed to identify potential drivers of salinization. The results of this study will provide baseline data on the occurrence and possible controls of groundwater salinization on the island, providing a foundation for future research and supporting more informed water management.