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Knowledge and Perception of Brine Waste Management Policies in the Desalination Industry, Malaysia

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Abstract

Desalination can be implemented to ensure sufficient water supply for agricultural and economic sectors, as well as daily population demand. This detailed study explores various methods for handling brine discharge in Malaysia by analyzing environmental regulations and practices from other countries. A survey of 20 expert engineers from the Department of Environment Malaysia (DOE) and community leaders has been conducted in the study. Later, a Fuzzy Delphi Method (FDM) was used to evaluate the key parameters of temperature limit (P1), pH limit (P2), salinity impact zone (P3), and salinity limit (P4) from the output of the questionnaire. The assessment indicated that P1, P2, P3, and P4 obtained fuzzy scores of 0.770, 0.790, 0.792, and 0.803, respectively. Moreover, factors such as the construction of a desalination plant need to be included in the prescribed activities of Schedule 1 (S1) or Schedule 2 (S2) under the Guidelines of Environmental Impact Assessment (EIA),

which are also being evaluated. The regulations on brine waste disposal in the Environmental Quality Act 1974 (S3) must be imposed and considered to be embedded in this regulation. From the survey, it has been indicated that S1, S2, and S3 had fuzzy scores of 0.803, 0.743, and 0.725, respectively. The expert chose the approach with the highest fuzzy score as the most acceptable option. This comprehensive analysis provides insight knowledge for Malaysia to have clear understanding and later develop sustainable approach in managing brine waste from desalination process and updating the current environmental regulations. © 2025 The authors. This article is published by IIETA and is licensed under the CC BY 4.0 license (<http://creativecommons.org/licenses/by/4.0/>). This article is licensed under the CC BY 4.0 license (<http://creativecommons.org/licenses/by/4.0/>)

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brine waste; environmental impact assessment; fuzzy Delphi study; seawater desalination; sustainability

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