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SITE RECOMMENDATION FOR THE INSTALLATION OF WATER TREATMENT PLANT AT VILLAGES IN THE DRY ZONE OF SRI LANKA

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Sri Lanka is not a water scarce country. The water distribution within the country is uneven, hence acute water stress conditions are experienced in the dry zone of Sri Lanka. Majority of the dry zone groundwater wells experience high Total Dissolved Solids (TDS), fluoride and hardness which render water unpalatable. To combat water palatability, reverse osmosis (RO) water treatment plants were introduced both at house hold and community levels in dry zone villages. Recently, nano membrane (NF) and electrodialysis (EDR) water treatment methods have been introduced in two villages. In this work, we assess the hydro-geochemistry of well waters in two villages in the dry zone, namely Padhaviya, Ruwanpura (PR) (GPS: 8.8411, 80.8255) and Mihinthale, Natiyagama (MN) (GPS: 8.3310, 80.6011) which are facing acute water related health issues. Their water abundance and distribution were examined using Six 2-dimensional resistivity surveys.

The obtained results for average water quality parameters including TDS, total hardness and fluoride concentration for PR and MN are 300, 247.01, 0.25 and 460, 415.55, 1.10 in ppm, respectively. Lithologically both sites belong to Wanni Complex of Sri Lanka. Hornblende-biotite and charnockitic gneisses are the host rocks in PR site whereas hornblende-biotite and granitic gneisses are prevalent in MR site. From the resistivity models in PR site, 5-7 m thick groundwater table was observed in 2-3 m depth. Water filled deep fractures were not observed in the resistivity profile. Hence taking high yield from this site is questionable for larger scale plant, as drastic decrease of groundwater table can be expected. In MN site groundwater table was observed around 3 m depth constrains by two deep fractures possibly filled with water were identified. Hence highest yield of water can be expected from a deep well constructed in the MN site. Finally, the hydrogeo-chemical data coupled with resistivity data suggest Natiyagama, Mihintale as best location for the installation of community water treatment plant based on hybrid membrane technology.

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