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Over 3.8 million people living in the Dry Zone of Sri Lanka experience lack of drinking water largely due to palatability issues. As an interim measure, the National Water Supply and Drainage Board and private organizations introduced Reverse Osmosis (RO) technology to water desalination which removes almost all solutes in water. However, when inappropriately used, the RO technology desalinates water excessively, which also results in palatability problems due to lack of solutes. Nonetheless, membrane-based technologies are at the forefront of the world since they do not require chemicals excessively. In this research, an appropriate membrane configuration to desalinate groundwater using commercial membranes was examined. Particular attention was paid to treat wastes to minimize soil salinity issues. The concentrate of the community plant which has an approximate Total Dissolved Solids (TDS) of 3000 mg L⁻¹, was mixed with raw water and supplied for washroom use. The flushing water was used for gardening purposes. An automated laboratory-scale Nano Filtration (NF)/RO plant was developed to desalinate water collected from the dry zone using commercially available membranes. Based on the model plant, protocols were made for reverse flush, backwash, and chemical cleaning and used to upgrade a remote controlling application for a plant. The NF/RO treatment configuration was optimized for a community plant, and water quality parameters were modelled for at plant outlets. A chemical cleaning process was established for the community plant to avoid the efficiency decrement from carbonate fouling. The remote controlling application is functioning for a laboratory model. The predicted values of hardness, TDS and F⁻ from the model for treated water were 27.7 mg L⁻¹, 69.0 mg L⁻¹ and 0.31 mg L^{-1} respectively. The measured values for the same parameters were 30.0 mg L^{-1} , 70.0 mg L⁻¹, and 0.30 mg L⁻¹ indicating calculations are agreeing with the measurements. The use of rainwater for membrane cleaning and alternation for conventional pre-treatment units are some of the aspects we wish to examine in the future.

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