SALINE GROUND WATER MANAGEMENT FOR SUSTAINABLE ENVIRONMENT

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ABSTRACT

A strategy incorporating solar pumping of saline groundwater to shallow ponds incorporating a novel evaporation reduction technique, and subsequent dilution with winter rainfall to produce brackish quality water suitable for livestock and irrigation has been developed in Alexandria and is described in this paper.

Solar pumping from a depth of 14m is used to fill three interconnected ponds of approximately 115m diameter and 0.35 to 2.6m in depth. Approximately 130,000m^3 of saline groundwater (1,200mS/m, 6600mg/L) is pumped to the ponds each season which when diluted with average winter rainfall of 500-650mm/year provides a resultant shandy of water which can be classified as moderate/brackish (850 mS/m). This is suitable for irrigation of date palms and alfalfa crops and for livestock. The system is made viable through the innovative use of date palm leaves which are floated out over the ponds as a mat and reduce evaporation by over 80% of net pan evaporation.

KEYWORDS: Evaporation, Saline Water, Groundwater, Solar Pumping, Alexandaria, Brakish Water, Leaf Mat, Evaporation Rate