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Vulnerability of Groundwater System in Central Jordan Valley/Pollution Indicators and Decontamination Process

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ABSTRACT

More than 60% of the water demand in Jordan is covered by groundwater. Due to the accelerated population growth and development in all sectors including agriculture, more water has been pumped and more fertilizers have been supplied to the natural system. In the Jordan Valley; Agriculture is practiced along the year according to the agro climatic conditions as well intensive patterns of farming are carried out to satisfy the growing food demand in Jordan. Thus, Groundwater quality analysis proved that groundwater quality is relatively polluted with respect to NO_3^- and salinity. The pollution hot spots are mapped to be the vulnerable areas according to the considered variables (Geology, topography, land use etc). Within this work groundwater quality was evaluated according to the global standards to be moderately polluted and not drinkable in more than 50% of the analyzed samples. The groundwater vulnerability map indicates that the pollution sources in the study area are mainly due to the agricultural return flow. To assure safe water supply for rural farmers a solar still was designed and implemented in the area for two months. The discharged water from the still proved to be suitable for drinking with no NO_3^- content and economically it can be handled by locals.

KEYWORDS

Jordan Valley; Groundwater Vulnerability; Solar Distillation

Cite this paper

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References

- [1] K. S. Murray and D. T. Rogers, "Groundwater Vulnerability, Brownfield Re-Development and Land Use Planning," *Journal of Environmental Planning and Management*, Vol. 42, No. 6, 1999, pp. 801-810.
- [2] J. Vrba and A. Zaporozec, Eds., "Guide Book on Mapping Groundwater Vulnerability," *International Contributions to Hydrogeology (IAH)*, Hannover, Vol. 16, 1994, 131 Pages.
- [3] R. C. Knox, D. A. Sabatini and L. W. Canter, "Subsurface Transport and Fate Processes," *Lewis Publishers, USA*, 1993.
- [4] M. Fortin, K. P. B. Thomson and G. Edwards, "The Role of Error Propagation for Integrating Multisource Data within Spatial Models: The Case of the DRASTIC Groundwater Vulnerability Model," *Earth Surface Remote Sensing Procedure SPIE Conference*, London, 30 December 1997, pp. 358-361.
- [5] T. G. Fritch, et al. "An aquifer Vulnerability Assessment of the Paluxy Aquifer, Central Texas, USA, Using GIS and a Modified DRASTIC Approach," *Environmental Management*, Vol. 25, No. 3, 2000, pp. 337-345.
- [6] A. H. Jasem and M. Alraggad, "Assessing Groundwater Vulnerability in Azraq Basin Area by a Modified DRASTIC Index," *Journal of Water Resource and Protection*, Vol. 2, 2010, pp. 944-951.

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- [7] R. A. Freeze, and J. A. Cherry, "Groundwater," Printic-Hall Inc., New Jersey, 1979, 604 Pages.
- [8] SPSS 9.2 for Windows, "Statistical Package for the Social Sciences," Lead Technologies, Inc., Chicago, 2007.
- [9] D. R. Helsel and R. M. Hirsch. "Statistical Methods in Water Resources," USGS, 2002.
- [10] L. V. Wilcox, "Classification and Use of Irrigation Waters," United States Department of Agriculture Cir. 969, Washington DC, 1955, 19 Pages.
- [11] A. Saleh, F. Al-Ruwaih and M. Shehata, "Hydrogeochemical Processes Operating within the Main Aquifers of KUWAIT," Journal of Arid Environments, Vol. 42, 1999, pp. 195-209. doi:10.1006/jare.1999.0511
- [12] K. P. Karanth, "Hydrogeology," McGraw-Hill Publishers, New Delhi, 1989.
- [13] K. P. Karanth, "Impacts of Human Activities on Hydrogeological Environments," Journal of the Geological Society of India, Vol. 38, 1991, pp. 195-206.