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[JWARP](#) > Vol.5 No.1, January 2013



Water Quality in the Gaza Strip: The Present Scenario

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ABSTRACT

The Gaza Strip is one of the most densely populated areas in the world, 4505 people per km² and the only source of water is represent by groundwater. The water quality in Gaza is very poor and the groundwater is affected by many different contaminants sources including soil/water interaction in the unsaturated zone due to recharge and return flows, mobilization of deep brines, sea water intrusion or upcoming and disposal of domestic and industrial wastes into the aquifer. Previous reports on the water quality in Gaza discussed the high levels of major ions (especially of chloride, nitrate and fluoride) in the drinking water. Moreover, little or no information is available for trace elements in the groundwater of the Gaza Strip. The sources of trace elements in groundwater could be natural and anthropogenic. 58 wells were sampled during July 2010, and were analyzed major ions and trace elements to check if the water quality is improving from the previous report. This study has revealed that no groundwater in Gaza Strip meets all WHO drinking water standards. The contaminants which affected the Gaza Strip are of different types and they originate from different sources. The environmental conditions are no safe for the population and some actions to improve the groundwater conditions are necessary to safeguard the population.

KEYWORDS

Gaza; Drinking Water; Trace Elements; Population Safety; Food Security

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References

- [1] B. Shomar, " Groundwater of the Gaza Strip: Is It Drinkable?" *Environmental Geology*, Vol. 50, No. 5, 2006, pp. 743-751. doi: 10.1007/s00254-006-0246-9
- [2] S. Ghabayen, M. S. McKee and M. Kemblowski, " Ionic and Isotopic Ratios for Identification of Salinity Sources and Missing Data in the Gaza Aquifer," *Journal of Hydrology*, Vol. 318, No. 1-4, 2006, pp. 360-373. doi: 10.1016/j.jhr.2011.03.031
- [3] W. D. Newcomb and J. D. Rimstidt, " Trace Element Distribution in US Groundwaters: A Probabilistic Assessment Using Public Domain Data," *Applied Geochemistry*, Vol. 17, No. 1, 2002, pp. 49-57. doi: 10.1016/S0883-2927(01)00089-0
- [4] B. Shomar, A. Yahya and G. Müller, " Potential Use of Treated Wastewater and Sludge in the Agricultural Sector of the Gaza Strip," *Technologies and Environmental Policy*, Vol. 6, No. 2, 2004, pp. 128-137. doi: 10.1007/s10098-003-0228-5
- [5] WHO, " Guidelines for Drinking-water Quality," 2010. <http://www.WHO.int>
- [6] PCBS, " Population, Housing and Establishment Census 2012," Palestinian National Authority, Palestinian Central Bureau of Statistics, Ramallah, 2012.
- [7] Metcalf and Eddy, " Costal Aquifer Management Program," Final Report: Modeling of Gaza Strip Aquifer, US Agency for International Development (USAID) and Palestinian Water Authority (PWA),

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- [8] APHA, " Standard Methods for the Examination of Water and Wastewater," 19th Edition, American Public Health Association, Washington DC, 1995.
- [9] Central Intelligence Agency, " The World Fact Book," 2012. <http://www.CIA.gov>
- [10] B. Shomar, G. Muller, A. Yahya, S. Askar and R. Sansur, " Fluorides in Groundwater, Soil and Infused Black Tea and the Occurrence of Dental Fluorosis among School Children of the Gaza Strip," *Journal of Water and Health*, Vol. 2, No. 1, 2003, pp. 23-35.
- [11] A. Avery, " Infantile Methemoglobinemia: Reexamining the Role of Drinking Water Nitrates," *Environmental Health Perspectives*, Vol. 107, No. 7, 1999, pp. 583-586.
- [12] T. Lebby, J. Roco and E. Arcinue, " Infantile Methemoglobinemia Associated with Acute Diarrheal Illness," *American Journal of Emergency Medicine*, Vol. 11, No. 5, 1993, pp. 471-472. doi:10.1016/j.bbr.2011.03.031
- [13] A. Avery, " Cause of Methemoglobinemia: Illness versus Nitrate Exposure," *Environmental Health Perspectives*, Vol. 109, No. 1, 2001, pp. A12-A14.
- [14] R. J. Freishtat, J. M. Chamberlain, C. M. S. Johns, S. J. Teach, C. Ronzio, M. M. Murphy-Smith and N. Gor, " A Cross-Sectional ED Survey of Infantile Subclinical Methemoglobinemia," *American Journal of Emergency Medicine*, Vol. 23, No. 4, 2005, pp. 574-576. doi:10.1016/j.ajem.2004.12.008
- [15] R. Venkateswari, R. Ganesh, M. Deenadayalan, E. Mahender, B. Ramachandran and L. Janakiraman, " Transient Methemoglobinemia in an Infant," *The Indian Journal of Pediatrics*, Vol. 74, No. 11, 2007, pp. 1037-1038. doi:10.1007/s12098-007-0192-x
- [16] B. Shomar, K. Osenbrückb and A. Yahyaa, " Elevated Nitrate Levels in the Groundwater of the Gaza Strip: Distribution and Sources," *Science of the Total Environment*, Vol. 398, No. 1-3, 2008, pp. 164-174. doi:10.1016/j.scitotenv.2008.02.054
- [17] M. E. Crespo-López, G. L. Macêdo, S. I. D. Pereira, G. P. F. Arrifano, D. L. W. Pican?o-Dinizc, J. L. M. do Nascimento and A. M. Herculano, " Mercury an Human Genotoxicity: Critical Considerations and Possible Molecular Mechanisms," *Pharmacological Research*, Vol. 60, No. 4, 2009, pp. 212-220. doi:10.1016/j.phrs.2009.02.011
- [18] G. F. Craun, " Review of Epidemiologic Studies of Aluminium and Neurologic Disorders," *Environmental Geochemistry and Health*, Vol. 12, No. 1-2, 1990, pp. 125-135. doi:10.1007/BF01734062
- [19] INERIS (Institut National de l' Environnement Industriel et des Risques), " Plomb et ses Dérivés, in Fiche de Donnees Toxicologiques et Environnementales des Substances Chimiques," INERIS, Paris, pp. 1-90.
- [20] R. Fertmann, S. Hentschel, D. Dengler, U. Jan and A. Lommel, " Lead Exposure by Drinking Water: An Epidemiological Study in Hamburg," *International Journal of Hygiene and Environmental Health*, Vol. 207, No. 3, 2004, pp. 235-244. doi:10.1078/1438-4639-00285
- [21] M. Robson, " Methodologies for Assessing Exposures to Metals: Human Host Factors," *Ecotoxicology and Environmental Safety*, Vol. 56, No. 1, 2003, pp. 104-109. doi:10.1016/S0147-6513(03)00054-X