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Agrochemical Concentration Level in Zaria Dam Reservoir and Ground Waters in the Environs

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ABSTRACT

This study examines the effect of agrochemical used for faming in the Galma Dam area on the quality of water in the reservoir and well water around the reservoir. Nine sampling points upstream of the Galma Dam were randomly se- lected for the study. Also, six hand dug wells in use by adjacent communities were identified for ground water samples. The study covered the period July to September 2011. All measurements were in accordance with the Standard Methods for the Examination of Water and Wastewater. The parameters measured and their mean concentrations from the reser- voir are in the order of: Chlorides (0.600 - 0.900 mg/l); Nitrates (0.009 - 0.019 mg/l); Bicarbonates; 0.444 - 1.900 mg/l); Total Phosphates (0.173 - 3.077 mg/l); Sulphates (0.617 - 3.587 mg/l); and pH (6.4 - 7.5). For the well water samples, the results ranged from 1.58 - 3.10 mg/l; 0.14 - 0.03 mg/l; 0.60 - 2.73 mg/l; 0.08 - 1.89 mg/l; 0.33 - 2.66 mg/l and 6.05 - 7.0 respectively in the order previously listed. The results were statistically analyzed using ANOVA at 95% confidence level. Chlorides showed no significant variation between sampling points but significant variation with dates of sam- pling for surface and well waters. Nitrates variations with both sampling points and dates of sampling were insignificant. Bicarbonates variations with sampling points and dates of sampling were highly significant. Total Phosphates and Sul- phates variations with sampling points and dates of sampling were insignificant and significant respectively. pH values variations with sampling points and dates of sampling were insignificant and highly significant respectively. Generally, the mean concentrations are within the WHO maximum limits of the parameters in drinking water and recommenda- tions were made regarding the use of agrochemicals for farming in the area.

KEYWORDS

Surface and Ground Water Qualities; Agrochemicals; Mean Concentration Levels

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References

[1] S. M. Zubair Pirzada, "Estimating of Useful Life of Zaria Dam (Galma Reservoir), Kaduna State," M.Sc Project, Unpublished, 1978.

[2] Final Draft, "Fertilizers and Pesticides," Issue Paper, Vol. 4, No. 2, 1997, pp. 1-15. Final Draft\gwmp\vol4-rev\appnd-2\fertpest.doc,

[3] O. D. Jimoh, M. A. Ayodeji and B. Mohammed, "Effects of Agrochemicals on Surface Waters and Ground Waters in the Tunga-Kawo (Nigeria) Irrigation scheme," Hydrological Sciences, Vol. 48, No. 6, 2003, pp. 1013-1023.

[4] R. C. Gilden, K. Huffling and B. Sattler, "Pesticides and Health Risks," Journal of Obstetric, Gynecologic, & Neo- natal Nursing, Vol. 39, No. 1, 2010, pp. 103-110. doi:10.1111/j.1552-6909.2009.01092.x

[5] R. L. Kellogg, R. Nehring, A. Grube, D. W. Goss and S. Plotkin, "Environmental Indicators of Pesticides Leaching and Run-Off from Farm Fields," United States Department of Agriculture Natural

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Resources Conservation Service, 2000. http://www.nrcs.usda.gov/Technical/Land/Pubs/eip-pap.html

[6] S. Kuniuki, "Effects of Organic Fertilization and Pesticide Application on Growth and Yield of Field-Ground Rice for 10 years," Japanese Journal of Crop Science, Vol. 4, No. 70, 2001, pp. 530-540.

[7] A. Hotton, J. I. Barminas and S. A. Osemeahon, "Pesticide Umnary Metabolite and Deposit on Agro-chemicals Retail Outlets in Taraba Nigeria," European Journal of Scientific Research, Vol. 46, No. 4, 2010, pp. 584-591.

[8] A. Hotton, J. I. Barminas and S. A. Osemeahon, "Evaluation of Exacholorocyclodhexane Isomers in the Blood of Agrochemicals Retailers in Taraba," Nigeria American Journal of Scientific and Industrial Research. http://www.schub.org/AJSIR ISSN: 2153-649X

[9] R. Knuston, "Economic Impact of Reduced Pesticide Use in the United States," Agricultural and Food Policy Centre, Texas A & M University, 1999. http://www.afpc.tamu.edu/pubs/1/148/99-2.pdf

[10] D. S. Powlson, T. M. Addiscott, N. Benjamin, K. G. Kassman, T. N. de Kok, H. V. Grinsven, J. L. L'hirondel, A. A. Avery and C. V. Kessel, "When Does Nitrate Become a Risk for Humans. American Society of Agronomy, Soil Science Society of America, Crop Science Society of America," Journal of Environmental Quality, Vol. 37, No. 2, 2008, pp. 291-295. doi:10.2134/jeq2007.0177

[11] J. Jurewicz and W. Hanke, "Parental and Childhood Exposure to Pesticides and Neurobehavioral Development: Review of Epidemiological Studies," International Journal of Occupational Medicine and Environmental Health, Vol. 21, No. 2, 2008, pp. 121-132. doi:10.2478/v10001-008-0014-z

[12] K. L. Bassil, C. Vail, M. Samborn, D. C. Cole, J. S. Kaur and K. J. Kerr, "Cancer Health Effects of Pesticides: Systematic Review," Can Farm Physician. Vol. 53, No. 10, 2007, pp. 1704-1711.

[13] Department of Health, "Toxic Substances Fact Sheet: Nitrates in Drinking Water," Office of Environmental Health Programs, Olympia, 1990.

[14] B. A. Adelekan, "Water Quality of Domestic Wells in Typical African Communities: Case Studies from Nigeria," International Journal of Water Resources and Environmental Engineering, Vol. 2, No. 6, 2010, pp. 137-147.

[15] G. T. Miller, "Sustaining the Earth," 6th Edition, Thomp- son Learning, Inc., Pacific Grove, 2007, pp. 221-216.

[16] D. Gunnell, M. Eddleston, M. R. Phillips and F. Konradsen, "The Global Distribution of Fatal Pesticides Self- Poisoning: Systematic Review," BMC Public Health, Vol. 7, 2007, p. 357. doi:10.1186/1471-2458-7-357

[17] Norther Nigeria Geological Survey Map, "Sheet 102, Zaria-Kaduna," 2nd Edition, 1965.

[18] Official Methods of Analysis of the Association of Official Analytical Chemists, "Methods 960.30," Manual, 15th Edition, 1990.

[19] American Public Health Association, American Water Works Association and Water Environmental Federation, "Standard Methods for the Examination of Water and Wastewater, 1992.

[20] American Society for Testing and Materials, "Mannual of Water and Environmental Technology Method D1385- 88," ASTM, West Conshohocken, 1987.

[21] P. L. Viola, "Carcinogenic Effects of Vinyl Chloride," 10 th International Cancer Congress, Huston Texas, 22-29 May 1970.

[22] C. Maltoni, "Cancer Detection and Prevention," 2nd International Symposium on Cancer Protection and Prevention, Bologna, 9-12 April 1972.

[23] EPA, "Toxicological Review of Vinyl Chloride in Support of Information on the IRIS," Washington DC, May 2000.

[24] EPA, "National Emission Standards for Hazardous Air Pollutants for Vinyl Chloride Sub Part," Vol. 66, No. 186, Washington DC, 2001.

[25] WHO, "Guidelines for Drinking Water Quality," 3rd Edition, World Health Organization, Geneva, 1993.

[26] WHO, "Guidelines for Drinking Water Quality," Vol. 1, 3rd Edition, World Health Organization, Geneva, 2004.

[27] Biomedx, "The pH Equation of Health: How You Rot and Rust," 1998. http://biomedx.com/micrscpes/rrinfro/rr4.html

[28] W. Stumm and J. J. Morgan, "Aquatic Chemistry," Wiley, New York, 1981, p.780.

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