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Water quality and possible health impacts in Kaduwela area: An assessment using GIS techniques to find the possible interrelations

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Ground water quality generally deviates from one place to another according to its geological nature, climate changes, and anthropogenic activities. This study was conducted to investigate the possible relations between ground water quality and prevalence of diseases in seven gramaniladari divisions in the Kaduwela area. Thirty ground water samples were collected from 30 representative wells for each dry season and wet season**.**All water related diseases were correlated using Pearson's Correlation coefficient with chemical parameters including (1) Nitrate (NO_3^{2-}), (2) Chloride (Cl^-), (3) Sulphate (SO_4^{2-}), (4) Phosphate (PO_4^{3-}), (5) Total coliform, (6) *E. coli*, (7) Total hardness, (8) Total ammonia, and (9) Total iron.Data on water borne diseases were extracted from the Kaduwella MOH office and the PHI divisions ranked according to the high number of cases.The first two PHI divisions which are Nawagamuwa and Dedigamuwa were selected based on that rankings. Further a questionnaire data set was collected in the study area to make the correlation value more reliable. Thematic maps for each physico-chemical parameter were generated using ARCGIS 10.3. Boiling and filtering showed a strong interrelation in eradicating coliforms, while septic tank data from the questionnaire data set did not show a strong interrelation between tested water samples, as the distance between wells and septic tank has influenced that interrelation. Also a safety apron hasnot revealed any interrelation.Almost all water quality parameters are beyond the permissible limit, except coliforms in some area as per SLS 614: 2013 and WHO standards. However It was seen that there is nothing that can be potable, because the *E. coli* and total coliforms in the study area were weighted at 0.00004 by the idw tool. But the SLS standard is 0. So a proper environment management plan must be adopted to control drinking water pollution immediately. It is also recommended to use water only after boiling and filtering or by Reverse Osmosis treatment for drinking purpose by the individuals, to prevent adverse health effects.

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