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Characterization of the origin and hydrogeochemical facies of physic-chemicals parameters in groundwater: The case of catchment Ehania, South-Eastern Côte d'Ivoire

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The threat of groundwater quality has become a major concern for the world's population, mainly in agricultural areas. To solve this problem, several methods such as vulnerability to pollutants and statistics methods, have been adopted to protect these groundwaters. In this study, statistical tests and hydrogeochemical characterization were used to determine the likely source of pollutants in the groundwater resources and the hydrogeochemical facies. First, we make a comparative analysis and then analyzed pollutants parameters using Kohonen self-organizing map (SOM) which allows basic on the similarity to help out any correlation between the physic-chemical parameters. Then, hydrogeochemical analyses were used to describe the bodies of groundwater in aquifers. The results indicate very high levels of certain pollutants such as NO₃⁻, Cl⁻ and SO₄²⁻ with generally higher than World Health Organization (WHO) standards values. The analysis of the data from SOM method reveals a strong correlation between pollutants (NO₃⁻, SO₄²⁻, Cl⁻) and conductivity showing the likely origin of these surface pollutants. An origin that is linked to the existence of larges agro-industrials exploitations. The characterization of this resource with the triangular diagram Piper allowed identifying two families water that are waters chlorinated sulfated calcium and magnesium which represent 35 % of these resources on the one hand the bicarbonate calcium and magnesium water that represent 65% on the other.

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