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Identification of groundwater potential zones by using remote sensing and GIS techniques: A case study in Chittoor district Andhra Pradesh, India

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Groundwater is an important resource contributing significantly in total annual supply. However, overexploitation has depleted groundwater availability considerably and also led to land subsidence at some places. Assessing the potential zone of groundwater recharge is extremely important for the protection of water quality and the management of groundwater systems. Groundwater potential zones are demarked with the help of remote sensing and Geographic Information System (GIS) techniques. In this study a standard methodology is proposed to determine groundwater potential using integration of RS & GIS technique. The composite map is generated using GIS tools. The accurate information to obtain the parameters that can be considered for identifying the groundwater potential zone such as geology, slope, drainage density, geomorphic units and lineament density are generated using the satellite data and survey of India (SOI) toposheets of scale 1:50000. It is then integrated with weighted overlay in ArcGIS. Suitable ranks are assigned for each category of these parameters. For the various geomorphic units, weight factors are decided based on their capability to store groundwater. This procedure is repeated for all the other layers and resultant layers are reclassified. The groundwater potential zones are classified into five categories like very poor, poor, moderate, good & excellent. The use of suggested methodology is demonstrated for a selected study area in Chittoor district of Andhra Pradesh. This groundwater potential information will be useful for effective identification of suitable locations for extraction of water.

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Biochemical-remediation and physicochemical analysis of abattoir waste water effluent: A case study of Birnin-Kebbi abattoir

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Water quality and treatment is of increasing concern, especially in the developing countries where water quality is poor and proper treatment is lacking. The purification of abattoir waste effluent by bioremediation, and chemical remediation were carried out with the view of mitigating environmental pollution, disease outbreak and enhance recycling of slaughter house waste water effluent. Effluent collected from Birnin Kebbi abattoir was digested anaerobically for five (5) days using Staphylococcus aureus and Streptococcus pyogenes inoculated together, then the digested water sample was grouped into six (A B C D E F and H) these were subsequently flocculated with alum, moringa seed extract, alum and moringa seed extract, and chlorine, for four hours after which the samples were decanted then the resultant filtrates were subjected to the following physicochemical tests pH, turbidity, chemical oxygen demand (COD) and biological oxygen demand (BOD), also the whole set up were subjected to microbiological test such as colony plate count to enumerate the bacteria in CFU/ml, which were found to be within the range of 6x102– 210x102, while that of coliform count in ml/l 3 -200. The following pH average values was obtained at 7.24 and the COD range was 250 – 500,while the BOD range was 6.8 – 14.2 and the turbidity range in NTU was 55 – 650, for samples digested by the combined efforts of S. aureus and S. pyogenes. When all the results were compared to that of the world health standard all the tested parameters were found to be in conformity, but when compared with sample G (undigested waste water) they significantly differ, indicating that the treated waste effluents may be portable, and when released may cause no harm to the environment in the overall the combination of alum, moringa seed extract and chlorine yielded the best result for all the parameters tested.

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