

**INVESTIGATING THE QUALITY OF GROUNDWATER OF HAND DUG WELLS IN LAPAI, NIGER STATE USING
PHYSICO-CHEMICAL AND BACTERIO-LOGICAL PARAMETERS**

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Abstract: *Access to portable water is one of the most important ingredients for sustainable development of any community. The quality status of ground water from shallow hand dug well in Lapai area of Niger state North central Nigeria was investigated in the present study using physic-chemical and bacterio-logical Indices. A total of 35 ground water samples were collected from hand dug wells analyzed for chemical and bacterio-logical parameters. Prior to the analysis, the physical parameters were determined insitu using standard equipment in accordance with American public health association standard for water and waste water sampling. The geological mapping of the area revealed granite-gneiss as the dominant rock type. The structural analysis of the study area revealed the principal joint direction as NE- SW. the result of the laboratory analyses of the ground water sample showed that the main concentration of the major cations and anions are below the permissible limit recommended by the Nigerian Standard of Drinking Water Quality. However, the mean concentration of iron, copper and zinc in the locations along transition zone were found to be slightly higher than their respective recommended maximum permissible limit. Their presence in the ground water may be attributed to rock water interaction leading to bedrock dissolution, chemical weathering and dilution effect of the overlapping ferruginous sand stone from the nearby Bida Basin well as Leachate from decomposing metallic objects at dump site. The ground water is extremely poor bacterio-logical ly owing to the proximity of hand dug well to unlined soakaways and pit latherine. The mean concentration of total coil form (150.30cfu/100ml), E.coil (65.50cfu/100ml) and faecal strepp (85.40cfu/100ml) in the hand dug wells from the area implies faecal contamination, an indication that the water is in contact with human or animal faeces and it may be responsible for the occurances of foods borne and water borne diseases in the area. Physical deviation, which is attributable to the presence of the metals and bacteria in the ground water. Boiling of water before use for domestic purposes is recommended as most bacteria do not withstand elevated temperature. Sensitization of the people on the importance of good hygiene should be carried out in the area.*

Keywords: *Elevation, Ground Water Quality, Hand Dug wells. Lapai Niger State.*