

Determination of the Physicochemical and Bacteriological Parameters of Water Used for Irrigation in Kano, Nigeria

Basiru Abdulsalam¹, Abubakar Abdullahi Musa¹, Sarki Aliyu Salisu¹

Muhammad Bello Ibrahim¹, Salahu Hamza Mohammed¹

Sani Suleiman¹, Abubakar Ahmed²

Department of Civil Engineering¹

Department of Electrical Engineering²

Hussaini Adamu Federal Polytechnic, Kazaure-Jigawa State, Nigeria

Abstract: Irrigation is the artificial application of water to the soil for agricultural purposes. In most cases, existence of dry season is what gives birth or necessitates irrigation. Irrigation water from three sources (Challawa river, Jakara river, and Thomas dam at Dambatta) within and around Kano metropolis were analysed. The physicochemical parameters examined and their concentrations for the three itemised sources respectively include: PH (1.9, 6.9, and 7.2); Electrical Conductivity in $\mu\text{S/cm}$ (8240, 1020, and 430); Magnesium in mg/l (49.27, 68.55, and 41.23); Sodium in mg/l (40.78, 28.11, and 36.55); Total Hardness in mg/l (1200, 450, and 200); Copper in mg/l (0.51, 0.08, and 0.02); Arsenic in mg/l (0.26, 0.04, and 0.01); Zinc in mg/l (2.94, 4.57, and 0.58); Lead in mg/l (0.699, 0.276, and 0.013) and Total Dissolved Solids in mg/l (4055, 2433, and 1069). While the bacteriological parameters examined were: *E. coli*; *Salmonella*; *Shigella*, *Vibrio Cholerae*; *Pseudomonas* and Total Coliform Bacteria (TCB). All the irrigation water sources have demonstrated an alarming presence of all the bacterial contaminants with the exception of Challawa whose all samples showed negative for *Shigella* only. Total Coliform Bacteria (179.63, 1026.55, and 256.12/ml) also far exceeded the provided guideline of 1000/100ml. open defecation and poor management of the large volume of waste produced (including raw sewage) due to excessive domestic and commercial activities that also gets into the water sources may have caused this. The water can therefore be said to be contaminated making it unsuitable for irrigation purpose. On the physicochemical parameters, many of them like Electrical Conductivity, Zinc, and Total Dissolved Solids were found to be well above the maximum allowable limits in at least two of the three sources. Even though, Sodium, Total Hardness and Lead were found to be within acceptable limits in all the three sources, but the presence of concentrations of the other parameters in excess of allowable limits calls for serious concern that makes the water sources unsuitable for irrigation. Serious measures must be put in place to curtail the sources of this contamination before making more efforts again to neutralise the one already in there

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