



DEVELOPMENT AND PERFORMANCE EVALUATION OF A HOUSEHOLD SLOW SAND FILTER USING LOCAL MATERIALS

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ABSTRACT

A household slow sand filtration unit for domestic purposes has been designed and constructed using locally sourced sand from Kubanni river bed as the filter medium. Also, the performance of the filter unit was investigated in this study. The system was designed by evaluating the sand physical properties, such as effective size and uniformity coefficient, and ascertained that they are within recommended limits for slow sand filtration media. In addition, necessary governing design relations were considered in the design. From the result, the Kubanni river bed sand has an effective size of 0.18 and a uniformity coefficient of 2.72 which are within acceptable ranges for a filter medium. Water quality analyses of the influent and effluent samples taken from the slow sand filtration system reflect that the bacteria count in the raw water reduced from 95 MPN/100ml to 2MPN/100ml in the effluent. While the turbidity of the raw water reduced from 32.5 NTU (Nephelometer Turbidity Unit) to 12.40 NTU in the effluent. Also, the result indicates that the pH changed slightly in the raw water samples A and B from 7.72 to 6.98 and 7.49 to 6.96 respectively. Since the filter media are locally sourced and could achieve a wholesome level of water treatment, portable slow sand filtration unit should be encouraged for domestic purposes especially in the rural areas.

Keywords: Raw water, filter, portable water, artificial lake, water quality

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