



## IMPACT OF GRANULAR ACTIVATED CARBON AND MAGNETIC FIELD IN SLOW SAND FILTER ON WATER PURIFICATION FOR RURAL DWELLERS

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**ABSTRACT**

Most farmers that produce food crops in Nigeria live in rural areas where potable water is not available. The farmers in some areas have problem of water borne diseases which could affect their health and could lead to death. This study was conducted to determine the impact of incorporating Granular Activated Carbon (GAC) and Magnetic Field (MF) in Slow Sand Filter (SSF) on the purification of water for rural dwellers. The SSF was constructed using PVC pipe (152.4 mm diameter and 1100mm long) with layers of fine sand (size 0.25mm and 350mm depth), followed by GAC (10mm size and 100 mm depth), fine sand (0.25mm with 500mm depth) and gravel (grain size 10-14 mm and 100mm depth). The SSF was kept moist for 21 days for biofilm layer (*schmutzdecke*) to fully develop which is essential for trapping bacteria. Two SSFs fabricated consist of SSF+GAC+MF as Filter 1, SSF+GAC as Filter 2 and Control (Raw water without passing through the filter. Water samples were collected from the filter and analyzed. The discharge capacity of the filter was 25 litres/h. Total bacteria counts (TBC) for Filter 1 and Filter 2 and control were 2.4, 4.6 and 8.1 cfu/mg, respectively. Total coliform count for Filter 1 and Filter 2 and control were 1.7, 3.0 and 6.4 cfu/100mL, respectively. The filters reduced water hardness, turbidity, lead, copper, electrical conductivity and reduced TCC by 53.13-73.44% but increased pH from 5.8 to 7.1-7.3. The SSF is recommended for water purification in the rural area.

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