

Assessment of indoor air quality in traditional houses (tembe) in Ilongero village Singida region Tanzania

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The quality of indoor air in traditional house (*tembe*) has been assessed in Ilongero village in Singida. Three air pollutants namely, gases pollutants (CO, H₂S, SO₂), suspended particulate matter (SPM) and elemental composition of (SPM) were measured in ten households of Ilongero village using portable multi-gas detector RH-1200 and Micro Dust Pro, an aerosol monitoring system and Wavelength Dispersive X-ray fluorescence was used for analysis of elements in samples of collected particulate matter. The results show that with exception of SO₂ other gas pollutants were present at levels above the WHO and TBS guidelines. CO concentration ranged from 65.43-81.31 mg/m³ which were higher than WHO and TBS standards of 50 mg/m³. H₂S concentration ranged from 0.67 to 0.71 mg/m³ which exceeds WHO and TBS guidelines of 0.15 mg/m³ while SO₂ ranged from 0.056 to 0.058 mg/m³ which was within the WHO guideline value of 0.5 mg/m³.

The concentration of Suspended Particulate Matter in this study varied from 329 to 14210 µg/m³ which were above WHO standard adopted by TBS of 150 µg/m³. This study identified the presence of trace and heavy elements in indoor particulate matter. About twelve elements Al, P, S, Fe, Si, Pb, Cu, As, Mg, K, Ca and Cl were found to have concentrations above the MDL of analytical instrument used and above the control sample. Others were found to be above the recommended guidelines suggested by WHO and TBS. The highest concentration was Al which was (2726 mg/kg) followed by P (933 mg/kg) and Fe (381 mg/kg) The indoor and outdoor ratio (I/O) of SPM was determined in this study and found to be greater than one in all sessions of measurements and in all households, which indicates that the main source of SPM was from inside. According to the results of this study, residents of Ilongero village living in *tembe* houses are in risks of getting respiratory diseases and eye irritation. It is recommended that for those people still living in *tembe*

houses, they should avoid indoor living during cooking hours except those who are involved in cooking.