

Feasibility of using scoria and pumice as aggregates and using lime and pozzolan as binders in production of lightweight aggregate blocks

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In Tanzania, most engineers use natural sand and granite aggregates for the production of concrete and this has caused serious geological and land degradation problem. In volcanic areas, we have other types of aggregate like pumice and scoria which would be used with the natural pozzolan found in these areas to make cheaper concrete and building blocks and minimize the degradation problem. This study investigated the use of pumice and scoria aggregates to make lightweight construction blocks using natural pozzolan and lime as binders. The aggregates and natural pozzolan used were from Arusha, Kilimanjaro and Mbeya Regions of Tanzania. Different lime: pozzolan ratios were investigated and these were 1:2, 1:3 and 1:4. The binder: aggregates ratios were also varied in the ratios 1:3, 1:6 and 1:9. The objective was to determine which ratios would meet the blocks strength requirements normally employed in practice. The water binder ratios used were obtained by trial and error to give stable un-collapsible blocks. It was found out that the strength obtained for the blocks ranged from 1 - 2 N/mm² and 1 - 3 N/mm² when pumice and scoria were used respectively, and strengths were sufficient for non-load bearing walls. It was also established from the strengths obtained from scoria could be used as blocks for low cost houses and in one to two story buildings