Geo-Hazards Assessment of Borrow Pits Excavation on the Environment

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Abstract

Geo-environmental hazards associated with abandoned borrow pits in Nigeria are on the rise and a major concern to citizens, environmentalists and governments. Several highway failure spots are directly linked to the action of erosion initiated by active or abandoned (inactive) borrow pits situated close to the roads. This study examines the negative environmental impacts of the continuous removal of soil from borrow pits in some areas of Ado Ekiti, Nigeria. Four borrow pits were selected; two active sites and two abandoned sites. At inception, topographical and 3-Dimensional maps of the borrow pits were drawn and modelled. The area of the borrow pits and the volume of overburden excavated soils were calculated. The soil over burden pressure at the average height of the borrow pits were measured. The active borrow pit sites were checked again after two months to know the difference in the volume of overburden removed in the pit for that period. The volume of soil removed from borrow pit 1 (Active site), 2 (Active site), 3(Abandoned) and 4 (Abandoned) are 37000 m3, 34000 m3, 114000 m3 and 81000 m3 respectively. Environmental assessment of the study area through photographs showed prevalence of landslides, erosion, flooding, vegetation removal and structural failure. The volume of soil overburden removed from the abandoned borrow pit is more than the volume extracted from the active sites, this significant change in the value of overburden removed causes significant change to the terrain of the borrow pit. Some measures were then suggested to curb the problem occurring from the uncontrolled and indiscriminate borrow pits excavation thereby improving environmental sustainability. This study serves as a basis for government to put in place laws that help protect the environment from indiscriminate mining of borrow pits.

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