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Soil Stabilization and the Synthesis and Application of Nanostructured Ash from Biomass and Municipal Solid Wastes for a Green Environmental Geotechnics

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The application of biomass and municipal solid waste (BMSW) as dust or as amorphous material (ash) in the stabilization of weak and expansive soils used as subgrade materials has been high for many years. Geotechnical experts have relied on the effect of these materials, which are products of the direct combustion of lignocellulosic biomass or the pulverization of same on the geotechnical properties of soils. These ash and dust materials are prepared by direct combustion and UV-Vis spectrophotometric characterization to determine the average particle size of the ash materials. Results achieved through laboratory investigations have shown that the amorphous materials or dusts from these wastes, which included palm bunch ash, palm kernel ash, sugarcane bagasse ash, rice husk ash, snail shell ash, oyster shell dust, periwinkle shell ash, groundnut shell ash, coconut shell ash, etc., have improved the strength, consistency, characterization, gradation, moisture condition value, durability and swelling properties of soils thereby satisfying the materials requirement for use as admixtures, pozzolanas, binders or fillers in subgrade stabilization for pavement construction purposes. These have equally given the disposal of solid waste a boost such that this procedure enhances the efficiency of disposing these municipal solid wastes and making them reusable materials in the rehabilitation of the environment using a more ecofriendly binders with zero carbon emission and consequently reduced contribution to global warming.

Biography:

Dr. Kennedy C Onyelowe has PhD degree in Geotechnical Engineering from the University of Nigeria, Nsukka, Nigeria. He had over 10 years of research and teaching experience at the Michael Okpara University of Agriculture, Umudike, Nigeria. He has over 35 journal and conference articles published in reputable journals across the globe. My research interests are Geotechnical Engineering, Soil Stabilization, Environmental Geotechnics, Transportation Geotechnics, Nano-Geotechnology, Computational Geotechnics, Soil Erosions, etc. He looks up to explore new areas, make new contacts and become an internationally recognized academic collaborating with other international fellows in the areas of research, graduate co-advising, and teaching.