World Academy of Science, Engineering and Technology
International Journal of Agricultural and Biosystems Engineering
Vol:12, No:01, 2018

Geochemical Composition of Deep and Highly Weathered Soils Leyte and Samar Islands Philippines

Authors : Snowie Jane Galgo, Victor Asio

Abstract : Geochemical composition of soils provides vital information about their origin and development. Highly weathered soils are widespread in the islands of Leyte and Samar but limited data have been published in terms of their nature, characteristics and nutrient status. This study evaluated the total elemental composition, properties and nutrient status of eight (8) deep and highly weathered soils in various parts of Leyte and Samar. Sampling was done down to 3 to 4 meters deep. Total amounts of Al_2O_3, As_2O_3, CaO, CdO, Cr_2O_3, CuO, Fe_2O_3, K_2O, MgO, MnO, Na_2O, NiO, P_2O_5, PbO, SO_3, SiO_2, TiO_2, ZnO and ZrO_2 were analyzed using an X-ray analytical microscope for eight soil profiles. Most of the deep and highly weathered soils have probably developed from homogenous parent materials based on the regular distribution with depth of TiO_2 and ZrO_2. Two of the soils indicated high variability with depth of TiO_2 and ZrO_2 suggesting that these soils developed from heterogeneous parent material. Most soils have K_2O and CaO values below those of MgO and Na_2O. This suggests more losses of K_2O and CaO have occurred since they are more mobile in the weathering environment. Most of the soils contain low amounts of other elements such as CuO, ZnO, PbO, NiO, CrO and SO_2. Basic elements such as K_2O and CaO are more mobile in the weathering environment than MgO and Na_2O resulting in higher losses of the former than the latter. Other elements also show small amounts in all soil profile. Thus, this study is very useful for sustainable crop production and environmental conservation in the study area specifically for highly weathered soils which are widespread in the Philippines.

Keywords : depth function, geochemical composition, highly weathered soils, total elemental composition
Conference Title : ICSSPN 2018 : International Conference on Soil Science and Plant Nutrition
Conference Location : Paris, France
Conference Dates : January 25-26, 2018