Characterizing Soil Environment in The Rice Terraces of the Philippine Cordilleras

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Rice terraces of the Philippine Cordilleras, located in northern Luzon Island, are contribute to the food production as well as water and carbon storage. The rice terraces, which have been designated as the World Heritage and should be protected as a cultural heritage, were in danger of collapse. Thus we need to clarify the mechanism of collapse from the perspective of natural science and protect them efficiently. We made a hypothesis that rice terraces are water storage structures physically, so the weight of paddy affects the stability, which determined by levee length, the depth of hardpan, and water ponding depth. Mainly in Banaue, rice terraces in three location: Viewdeck; Bangaan; and Hapao were investigated. Sometimes, ponding water on the rice terraces had fermentation odor, and the hard pan was detected at deeper depth. During the in situ infiltration test, gas was coming up from the soil and the hydraulic conductivity was low or unmeasurable. Excess amount of organic matter was considered to cause the gas emission which disturbs the soil sedimentation and compression, resulting in hardpan formation failure. Although organic matter application was important to soil nutrition and high crop yields, it might result in reductive condition which causes mineral leaky paddy and harmful gas emission.

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