Geo-environment and Characteristics of Acid Sulphate Soil in the Lower Central plain, Thailand

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The characteristic of acid sulfate soil in the Central Plain of Thailand and its relationship with the Holocene landform evolution were studied. The largest area of acid sulfate soil is distributed in the deltaic plain area, and the area was former tidal plain which developed to the north of Ayutthaya in 7,000 yrs BP. Characteristics of the surface geology in the area are generally classified as follows. The surface horizon is an artificial horizon cultivated by agriculture. Sequence of subsurface upper horizon begins with silt and clay containing yellow mottles. The lower part of the subsurface horizon contains organic matters or black peat with wood fragments. The lowest horizon is greenish or bluish grey silty clay and is considered as shallow marine or marine in origin. Pleistocene sediments develop beneath the lowest horizon with stiff silt or clay with redoximorphic features. Field data of pH of the artificial horizons is 5.5-7.0. That of the upper and lower subsurface horizon, however, is 4.0-4.5 and 4.5-7.0, respectively. The pH of the lowest horizon is 6.0-8.5. From the result, the subsurface horizon is under the strong acid condition. The lower part of the subsurface soil is considered as the sediment deposited in the intertidal condition with mangroves. And the upper part of the subsurface soil is mainly light grey to brownish grey silty clay with rich in yellow mottles. The yellow mottles are considered as jarosite and this horizon is the strongest acid horizon in the section. The sedimentary environment of the horizon is considered as intertidal to deltaic condition after the culmination of Holocene transgression. This condition also caused rich iron sulfur condition. And the iron sulfur is mainly considered as pyrite. After the drainage system was introduced in the plain, oxidation caused change of pyrite to jarosite appearing as yellow mottle. In conclusion, acid sulfate soil was formed in the sediments deposited in the tidal plain especially covered with mangrove forest and in the deltaic plain during middle to late Holocene. The subsurface soil changed to strong acidic condition under the oxidation after the drainage system was introduced. Little fluvial sediment deposited on the subsurface acid soils in the lower Central Plain.