Soil Physical Characteristics and Saturated Hydraulic Conductivity in the Landform of Barito Delta, Kalimantan, Indonesia

Abstract

We explore the soil physical characteristics in wetland of Barito Delta from primary data of soil sample and electrical resistivity measurement with the support from some secondary data. We also estimate saturated hydraulic conductivity (K_s) in Barito Delta from soil physical characteristics applying Saxton and Rawls (1986) and Weynants et al. (2009). Soil texture profile is determined from interpolation of soil fraction in each layer applying Bayesian statistics to analyze soil physical characteristics in the landforms of Delta. Clay is the dominant soil fraction in the soil of Barito Delta. Clay fraction percentage decrease along the depth of soil profile as it reaches fine sand particles deriving from ancient sedimentation from the past. It is an opposite with soil organic matter content that has contrast value from 1st to 2nd soil depth, but a few discrepancy from 3rd depth to downward direction. The content of clay in the soil depends on the sedimentation activity in the landform. Clay is dominant soil particle in the Delta; in case, it is in flat area and there is no intensive of sea water sedimentation such as in Basin of Peat Anticline and Natural Levee. In more than 2 m depth of soil, loamy sand and silty clay textures are mostly in the landform that is influenced by sea water activity, while by river water is clay loam. K_s values from Saxton and Rawls (1986) are close to K_s values from the measurement of previous studies. K_s values are generally small in Barito Delta that is mostly ranging from 1.10^{-7} to 2 m s^{-1}. K_s values are larger following the depth of soil profile. The values of K_s are smaller in Basin of Peat Anticline and Natural Levee than in Tidal Flat and Beach Ridge. It is because both landforms have clay as dominant soil particles.