Pengembangan Model Tanah-Landskap untuk menaksir Sifat Tanah di Pulau Jawa
(Developing Soil-landscape Models to Predict Soil Properties in Java Island)

Oleh: Yiyi Sulaeman [2], Atang Sutandi [3], Baba Barus³, Djunaedi A. Rachim³


Abstract

Soil and terrain data are required by any environmental and ecological modeling, so these data must be available in appropriate format and accepted accuracy. Usually these data are collected during soil survey and soil laboratory analysis although in fact these activities consume much time, labor intensive, and expensive. The digital soil mapping approach offers quicker, cheaper techniques to provide data in accepted accuracy. This approach makes use available soil data and modeling technology. To be effective and efficient, this approach must be supported by soil-landscape models. This research aims to (i) identify environmental variables that can be used to predict soil properties in Java, (ii) develop soil-landscape models using legacy data, (iii) evaluate the predictive capability of developed model using cross-validation technique. The used dataset covered 12 soil properties as response variables extracted from 301 soil profile data from previous soil survey in Java and 21 covariates as predictor variables represented topography derived from SRTM DEM. Predictor selection used stepwise and model building used linear regression. The results are 30 soil-landscape regression models to predict soil properties i.e. soil depth, thick of A- horizon, depth to B horizon, clay percentage, sand percentage, soil organic matter, soil organic carbon, total nitrogen, pH, P retention, base saturation, and cation exchange capacity. Model validation indicates that these models can be used to predict soil properties in other site. The research and resulted models may be used as benchmark for further soil-landscape modeling in tropical region especially in Indonesia.
Keywords: soil-landscape model, stepwise, linear regression, digital soil mapping