Digital soil mapping in assessment of land suitability for organic farming

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Digital soil mapping (DSM) is a fast-developing sub discipline of soil science which gets more importance along with increased availability of spatial data. DSM is based on three main components: the input in the form of field and laboratory observational methods, the process used in terms of spatial and non-spatial soil inference systems, and the output in the form of spatial soil information systems, which includes outputs in the form of rasters of prediction along with the uncertainty of prediction.

Georgia is one of the countries who are under the way of spatial data infrastructure development, which includes soil related spatial data also. Therefore, it is important to demonstrate the capacity of DSM technics for planning and decision making process, in which assessment of land suitability is a major interest for those willing to grow agricultural crops. In that term land suitability assessment for establishing organic farms is in high demand as market for organically produced commodities is still increasing.

It is the first attempt in Georgia to use DSM to predict areas with potential for organic farming development. Current approach is based on risk assessment of soil pollution with toxic elements (As, Hg, Pb, Cd, Cr) and prediction of bio-availability of those elements to plants on example of the region of Western Georgia, where detailed soil survey was conducted and spatial database of soil was created. The results of the study show the advantages of DSM at early stage assessment and depending on availability and quality of the input data, it can achieve acceptable accuracy.