

## **DEVELOPMENT OF A DIGITAL SOIL DATA BASE FOR SRI LANKA**

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Soil degradation is one of the major problems in Sri Lanka and proper land use planning has to be practised to minimize this environmental problem in the future. The main limitation in sustainable soil management is the lack of an easily retrievable organized database. The present database, which was developed around 1972 and updated periodically later, cannot be used with modern techniques as Geographical Information Systems (GIS). In addition, soils of Sri Lanka need to be classified using internationally accepted systems for better agro-technology transfer. The objective of this study was to develop a digital soil database for Sri Lanka, which could be used for classification according to internationally accepted systems, mapping and for land use planning.

The three main rainfall zones, the Wet, Intermediate and Dry zones were covered in successive steps during the development of the database. The number of soil series characterized were 28, 41 and 55 from Wet, Intermediate and Dry Zone respectively. A soil series is a group of soils consisting of similar sequence of horizons and developed from the same parent material. The landscape and topographic components as well as soil profile description of benchmark sites for each soil series were done according to FAO method. Soil physical and chemical properties were characterized for the major soil horizons in these benchmark sites using standard methods. These include physical properties as soil texture, bulk density, hydraulic conductivity, wet and dry aggregate stability and, chemical properties as pH, organic matter, available bases, base saturation, total N, available P and electrical conductivity. The data obtained from road cuts, auger boreholes and previous studies were used in addition to the information collected from the benchmark sites in mapping the soils at series level.

The databases for the Wet and Intermediate zones are already developed and available as hard copies and in electronic forms. Soils of these areas were classified according to internationally accepted methods as Soil Taxonomy and FAO method and mapped at 1:250,000 scale. The spatial component of the data, which is the soil series, is linked to the landscape, topographical features and soil properties of each series. The land use planner can make any logical query and the database is capable of displaying the soil series, which match the given requirements. The database could be used for many applications as suitability mapping, management of problem soils, erosion hazard mapping and for simulation of water or solute flow as Nitrogen or pesticide movement to ground water. Since the benchmark sites and other spatial components are geo-referenced, the database could be easily integrated with other geographical datasets such as detailed elevation model, relief etc. The database could be updated when new data become available. The database could be used through Arc View GIS and user-friendly interfaces have been provided for novice users.