Theme 2 | Advances in soil mapping and monitoring

Digging the soil natural resources with soil survey: Advanced stages and general uses

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Introduction

Soil survey describes, classifies, plots and makes a general description, classification, and forecasts about the condition, status, limitations of a soil based on the standard system of taxonomy with multiple uses and their likely response to management applications (USDA-NRCS, 2021). It is a component of soil science that has specific objectives, types, stages and overall uses (Usman *et al.,* 2020).

Aim of the study

The aim of this research is to provide a general background of various stages and uses of soil survey needed for the excavation processes of the natural resources from soil and soil reservoir.

Materials and methods

This study employed the use of soil survey guidelines and descriptions provided in the literatures, which includes FAO guidelines for soil description (FAO, 2006), Field Book For Describing And Sampling Soils Version 3.0 (USDA-NRCS, 2021), Visual Soil Assessment (VSA) Field Guide (FAO, 2008) etc.

Fig.1: Soil survey assessment in the field

Environmental soil components

The environmental soil dimensions, which also have direct and indirect connections to these broad stages include soil assessment, land evaluation, remote sensing, soil mapping, visual soil assessment, soil homogeneity, soil heterogeneity, artificial soils, indoor soils, soil anisotropy, soil atmosphere, soil pollution, soil contamination, soil thatch layer, soil crust layer, soil pedestals layer, soil armour layer, soil water and soil pedon.

Digging the soil through soil profile

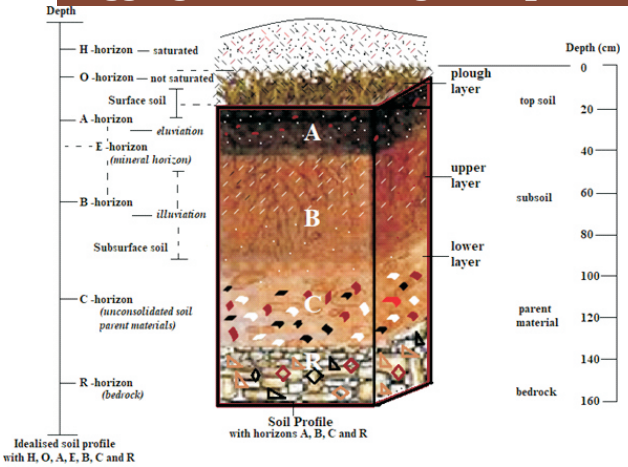

Fig.2: Soil profile components for soil survey

Stages of soil survey

Detail consideration of eight (8) different stages is covered in a hierarchical order as follows:

1. Historical survey,
2. Site description,
3. Soil description,
4. Digital soil mapping,
5. Land/soil evaluation,
6. Soil risk assessment survey,
7. Recommendations
8. Applications of recommendations.

Uses of soil survey

Soil surveys can be used for wide range of benefits, which include the following:

1.Soil survey information can be used to predict or estimate the potentials and limitations of soils for many specific uses such as agriculture, housings, road construction etc.

2.Soil survey can be used to make workable plans for land management, soil fertility and soil quality rehabilitation.

3. Soil survey provides evaluation along with economic, social, and environmental considerations, which can be used to predict and make valid recommendations for wide range of land uses an managements potentials.

4. Soil survey information can be used to improve water and forest quality for agricultural and horticultural production.

5.A soil survey can indicate the limitations and potentials of the soil, land, forest and vegetation areas for development of recreational areas for other similar purposes.

6.Soil survey information can be used for soil erosion modelling and conservation applications.

7. Soil survey can be used to predict the climate change impact and climate change adaptation programme in a given area.