



Nyandak
D.O.S. course
August 71

B. BRIEF DISCUSSION ON SOME OF THE KENYA SOIL TYPES

The sections below briefly outline the properties of only the soils that may commonly be met in the field. These 9 soils include the reddish soils (both deep and with laterite), the yellow red soils, the black and grey soils (both with or without calcium carbonate concretion), the vlei soils, the dark coloured soils, the alluvial soils, the saline/alkali soils, and the ash and pumice soils.

1. REDDISH SOILS

These are soils whose subsoils are predominantly reddish in colour. The soils may be underlain by laterite (ironstone) which is a superficial formation. Where there is no ironstone the soils are fairly deeply weathered. The soils are predominantly clay in texture with a blocky structure. The clay mineral consists of a non-expanding two-layer type (kaolinite) with a moderate water holding capacity. These soils are often moderately acid and are characteristically deficient in phosphorus and nitrogen if not virgin.

The deeply weathered red soils are mostly found on flat ridges and slopes of the areas of volcanic rocks of the Kenya highlands. The lateritic variant is however associated with well drained level areas adjoining slopes.

2. YELLOW-RED SOILS

Except for the subsoil colour which is yellowish red, these soils are closely similar to the red soils. They occupy upper slopes elsewhere and high grounds at the Coastal belt. They are also underlain by laterite in certain situations. At the coast, the soils may sometimes contain a subsoil which is very hard when dry but soft when moist.

3. BLACK AND GREY SOILS

These are soils whose colour is black or shades of grey. They are associated with low lying plains and valley bottoms. The soils derive from river and lake deposits and are predominantly heavy clay. They have an impeded drainage with an expanding three-layer clay mineral, (montmorillonite) dominating the clay mineral. The soils have a blocky or prismatic structure and heavily crack during the dry season. Once the rains set in

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the cracks close up and the soils become less permeable.

These soils which may have subsoil calcium carbonate concretions, have a very high water and nutrient holding power. Thus the fertility is usually high with a reaction (pH) on the alkaline side.

Bearing some resemblance to these soils are the brown and well drained calcareous soils (soils which react to acid). These soils derive from volcanic ash and old lake deposits (limestone). They however do not crack and their clay mineral is rather mixed. The soils may be found in semi-arid situations.

4. VLEI SOILS

These are poorly drained grey soils. They occur on level and sloping land at high altitudes and in low lying bottom lands. The poorly drained soils at high altitudes characteristically have a light textured topsoil which abruptly lies on a compacted and mottled heavy clay. Poor drainage of these soils is therefore the result of the impermeability of this layer.

These soils known as planosols have a prismatic subsoil structure and are particularly associated with areas which have had additions of volcanic ash.

Poorly drained soils of the low-lying bottom lands otherwise known as gley soils derive from materials transported from up slope (colluvium). They also receive seepage water which accumulate to impair the drainage of the soils. The poor drainage of these soils is therefore due to a very high water table almost throughout the year. The soils have greyish brown topsoil which is underlain by a grey and mottled clay. Their subsoil is however not compacted as in the case of the poorly drained soils at high altitudes.

5. ANDO-LIKE SOILS

These are initial dark soils on basic volcanic material. The topsoil which is moderately too strongly acid may be dark brown to dark greyish brown. In Kenya the soils which are well drained derive from volcanic ash and tuff and may be found at altitudes above 5000 ft. They are particularly found in the areas between Narok and Mau Narok and also on the slopes of Mt. Kenya although they may also be met in the Kinangop

Plateau (slopes of the Aberdares).

Buried soils are a common feature in the areas of ando-like soils because of the fresh addition of volcanic ash. Although movement and deposition (eluviation and illuviation) of clay down the profile ^{may be} common with ando soils elsewhere, the ones in Kenya have not been affected visibly. The soils have blocky subsoil structure and are generally coarser than clay. They are characteristically associated with copper deficiency in certain areas (e.g. Mau Narok area). The ando-like soils of the slopes of Mt. Kenya and the Aberdares are strongly acid with pH below 4.5.

6. ALLUVIAL SOILS

These are soils of active flood-plains which receive soil materials from elsewhere on flooding. They are limited to areas immediately bordering stream channels, flood plains, river deltas and low-lying bottom lands. The soils have fairly dark topsoil because of addition of organic matter and lack of well defined subsoil structure. They however have markedly visible profile layers which often have abrupt change in texture.

7. SALINE SOILS

These are soils which contain much salt (particularly sodium chloride and sodium sulphate). Because the salts have to be accumulated and concentrated, the formation of these soils is often associated with low lying depressions where seepage water may accumulate and the semi-arid conditions where the temperatures are high and evaporation to concentrate the salts is high.

The soils taste salt and may be found to support only salt tolerant vegetation. They naturally prevail in the semi-arid areas of Kenya namely Marsabit, Tana River, Garissa, Turkana, Taita/Taveta, Baringo and Kajiado districts. They may also be formed in the irrigation areas when facilities for removing the excess irrigation water are inadequate.

8. ALKALI SOILS

As more water becomes available for leaching and percolation or when the leaching becomes more effective because of improved drainage, the saline soil may become completely leached of soluble salt. This may result in the formation of a soil whose cations are dominated by sodium. Such a soil is called alkali soil.

These soils swell and disperse on wetting and may become extremely impermeable. The soils have blocky or prismatic subsoil structure with alkaline reaction. They are found in association with saline soils.

9. ASH AND PUMICE SOILS

These are dark greyish brown, humic surface soils which lie on a rather coarse textured and loose subsoil. The soils derive from recent unconsolidated volcanic ash and are particularly found in the Njoro (Nakuru) Naivasha and Longonot areas. They are characteristically deficient in copper and appear to be rich in potassium as in the Naivasha area.

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