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VEGETATION IN ZIMBABWE

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Vegetation Characteristics

There are few, if any, areas of natural vegetation in Zimbabwe if the term 'natural' is taken to mean undisturbed by man. The plant landscape comprises a mosaic of fallow and cultivated fields, sown and indigenous pastures, ruderal (mainly weed) communities bordering fields and roads, with remnants of relatively intact natural vegetation restricted to inaccessible sites, such as steep rocky slopes or terrain unsuitable for farming. Vegetation maps in textbooks and atlases normally portray the climax or natural vegetation, what would occur in the absence of man, rather than what actually occurs on the ground; hence such maps, including that of Wild and Fernandes (1967), can only provide a guide as to the vegetation characteristics of a given area.

The structure (vertical layering and horizontal spacing) and composition (plant species present) of the vegetation within a given locality will depend on the nature and interaction of present and past habitat factors. These can be grouped into climatic, edaphic and biotic factors.

1. Climatic Factors

Effective rainfall, that is the moisture which enters the soil and becomes available for plant uptake, is the most critical climatic factor influencing vegetation in Zimbabwe. The duration of the dry season, periodic droughts and frost are also important climatic factors which pose stress conditions on plants and hence influence their distribution.

There is a general moisture gradient from the high to low rainfall areas. In the areas of highest rainfall in the Eastern Highlands there is a mosaic of grasslands and forest communities. Forests typically occur on steep windward slopes and in sheltered valley sites, with high humidities beneath the tree canopies favouring the growth of many epiphytic ferns, fungi, lichens and mosses. The presence of grasslands in these areas appears to be due to the incidence of frosts and periodic fires, albeit the exact causes of the grassland-forest patchwork have not been studied fully (Fig. 1, p.15).

On the central plateau where rainfall is in the range 750-1000 mm per year, the dominant vegetation is a savanna woodland of Brachystegia spiciformis (musasa; igonde) and Julbernardia globiflora (munhondo; ishungu), with open stands of trees varying in height from 6 to 10 metres depending on soil depth and drainage. These stands have a discontinuous ground layer of shrubs and grasses, kept in check by root competition and shading by the trees. The musasa gives way to Brachystegia boehmii (mupfuti; itshabela) as the rainfall decreases. In the lower rainfall regions the woodland grades into tree and shrub savanna, that is woody communities of lower stature (2 to 6 metres) and a more open canopy. In the Bulawayo area, for example, Terminalia sericea (mususu; umangwe) and various species of Acacia and Combretum shrubs are dominant, whilst in the lowveld region in the south-east Colophospermum mopane (mupani; iphane) is a common tree along with the drought resistant Adansonia digitata (baobab; muuyu; umkhomo). Deep and

extensive rooting systems, water storage organs and small spiny leaves are some of the features which enable survival of woody plants in these dry regions. Similar xerophytic vegetation is found in the Zambezi valley in the north of the country.

The savanna grasses also follow a moisture gradient (Rattray, 1957). In the Eastern Highlands, for example, the montane grasslands are dominated by Loudetia simplex (russet grass) and Themeda triandra (red grass). Over most of the central plateau the thatching grasses, Hyparrhenia species, are most common with Heteropogon contortus (spear grass; tsine; inzala) becoming more important in the drier regions. In the south-east lowveld the love-grasses, Eragrostis species, are widespread whilst the hardy bristle grasses of the genus Aristida are common in the west of the country, especially on Kalahari Sands. The relative abundance of the grass cover within any given region depends largely on the density of woody species, incidence of fires and grazing.

2. Edaphic Factors

Edaphic factors are those related to the physical and chemical properties of the soil. These can modify and locally override the effects of climate on the vegetation. A classic example is the contrast between the grass covered serpentine-derived soils and wooded pyroxenite-derived soils on the Great Dyke. Chemically, the soils on serpentines are unfavourable for the growth of woody species mainly because of high concentrations of nickel and an excess of magnesium (Mg) over calcium (Ca); physically, the soils are shallow, stony and have a low moisture holding capacity so are hardly ideal for trees and shrubs. Some woody species can survive under such conditions, for example Protea shrubs, Faurea saligna (mutsatsati; umdwadwa) and Combretum molle (mupembere; umbondo), although individual plants tend to be rather stunted. The soils on the pyroxenite are deeper and have a more normal nutrient balance, hence they support a Brachystegia-Julbernardia woodland similar to that on sandveld soils on the granitic rocks on either side of the Great Dyke.

The presence and local abundance of a given species may be an indicator of peculiar edaphic conditions. For example, Becium homblei (copper plant) a geophytic herb, is characteristic of copper-rich soils, whilst Dicoma niccolifera, a prostrate herb, is a good indicator of soils with high concentrations of nickel. Sodic soils are identified easily by the presence of Colophospermum mopane and the fever tree Acacia xanthophloea. The mopane also occurs in poorly drained hollows in the higher rainfall areas near Harare, since sodium tends to accumulate in such sites giving rise to sodic soils more characteristic of the drier parts of the country. Parinari curatellifolia (muhacha; umkhuna) and Syzygium guineense (mukute or waterberry) are typical of poorly drained sites on the margins of vleis (hydromorphic grasslands) and fringing large granitic domes, where the footslopes receive excess runoff from the bedrock surfaces above them. Shallow, well-drained but gravelly soils are dominated very often by stands of Uapaca kirkiana (muzhanje; umhobohobo). It is rare, however, for soils to be the only limiting factor on plants; for example, shrubs of Protea abyssinica (mubonda; isiqalaba) and Terminalia sericea commonly occur on the sandy, temporarily wet margins of vleis. Such sites are very prone to frosts so the presence of these species is also a function of climatic factors as well as soil conditions.

In some parts of Zimbabwe it is possible to observe distinctive sequences of plant communities between ridge crests and valley bottoms, due mainly to changes in soil moisture conditions (Boughey, 1961). A common vegetation catena on sandveld soils around Harare is comprised of three elements. On the upper slopes there is a musasa-munhondo woodland on well-drained soils; on the mid-to-lower slopes there is a more open 'parkland' where scattered individuals of muhacha, mukute and protea are common on seasonally wet soils; the lowest slopes are characterised by herbaceous vegetation with coarse grasses and sedges in the wetter, more acid humic soils. Clumps of woody vegetation in the valleys invariably are associated with abandoned termite mounds; these provide a raised rooting site above the generally poorly drained vlei soils, hence can support woody plants.

Termitaria, especially the large mounds (20 m diameter and up to 5 m in height) of Macrotermes and Odontotermes species, provide an interesting edaphic environment. Mounds tend to be rather xeric habitats due to the high clay content of the termite soils and the steep, baked surface of mounds which favour rapid runoff. The gradual accumulation of nutrients within mounds (due to plant material collected by the insects) combined with limited, if any, leaching makes the mound soils more alkaline than surrounding areas. As a result termitaria soils resemble those found in the drier parts of the country. Consequently, large mounds around Harare, for example, support dense woody thickets of lowveld species such as the long-pod cassia Cassia abbreviata (muvheneka; isihaqa), Combretum species and the candelabra tree, Euphorbia ingens (mukonde; umhlonhlo). Fig trees and individuals of Diospyros mespiliformis (ebony; mushenje; umdlawuzo), common in gallery forests along lowveld rivers, also find refuge on termite mounds in the higher rainfall areas. Plants only colonise abandoned mounds and some of the large termitaria have been dated from archaeological remains to be in the order of 700 to 800 years old.

3. Biotic Factors

The impact of man on vegetation is a function of the density and duration of settlement as well as his level of technology. The latter determines the nature of tools available to clear or modify the plant cover. One of the earliest tools used by man in the past was fire, employed to drive game animals in hunting, to promote re-growth of moribund grasses for livestock and in the collection of honey from wild beehives. Consequently, man's impact may date back many thousands of years. It is, however, only in the present century that major changes have occurred as human populations and livestock numbers have increased (West, 1971).

One of the most common biotic impacts is the clearance of land for cultivation. The introduction of the plough, involving stumping of lands, and the change from shifting to permanent cultivation by peasant farmers in the early part of this century have had dramatic effects upon the vegetation. Over several decades large areas of the communal lands in Zimbabwe have been denuded almost entirely of their woody cover. Generally, the only trees to survive this onslaught are fruit trees, such as the muhacha. Extensive deforestation took place on the commercial farms during the early part of this century, especially on tobacco farms where trees were felled partly to provide firewood for curing the crop. In these areas, however, the farmers did establish plantations, mainly of eucalypts, and at an early stage realised that it was unwise to denude the steep hillslopes, hence the more extensive, but patchy, woody cover in these areas today.

Fire remains an important management tool in livestock and game ranching areas, as well as national parks. Periodic burning in such areas is carried out to remove moribund plant material and to keep in check woody plants, pushing the ecological balance in favour of herbaceous species. Late dry season fires have the greatest impact on woody plants since they are hotter than early season burns due to the greater abundance of dry fuel. The hot fires retard or even kill the small shrubs and trees. A combination of ring-barking of trees and periodic fires has turned extensive areas of woodland in Zimbabwe into open rangelands with scattered trees. Where overgrazing occurs, however, the balance tends to shift in favour of the woody species. Bush encroachment, especially by aggressive acacia shrubs, can form impenetrable thickets in overgrazed rangelands in the drier parts of the country.

Farming activities have resulted in the progressive restriction of the natural ranges of wild animals, especially the large mammals like elephants and buffalo. Concentration of wild animals within the relatively safe confines of national parks and game reserves has brought about dramatic changes in vegetation in some areas. Extensive stands of Brachystegia woodland in Chizarira National Park, north-west Zimbabwe, for example, have been devastated by elephants in a matter of six to eight years (Thompson, 1975). In other areas such as Hwange National Park, fine stands of mopane trees have been reduced, through debarking and boughbreaking, to low scrub. Even large baobab trees have been destroyed by elephants. In some cases the opening of the tree canopy by elephants favours the growth of herbaceous plants and creates ideal conditions for grazing animals such as zebra. In other situations, habitat devastation is so severe that it necessitates a reduction of the game population either by removal to another area or, more commonly, by culling operations. Where there are local concentrations of animals around pans, for example, then denudation of plant cover is common. This occurs in Hwange where borehole water is pumped into some of the pans partly to attract animals for tourist viewing and partly to provide a dry season water supply for the game.

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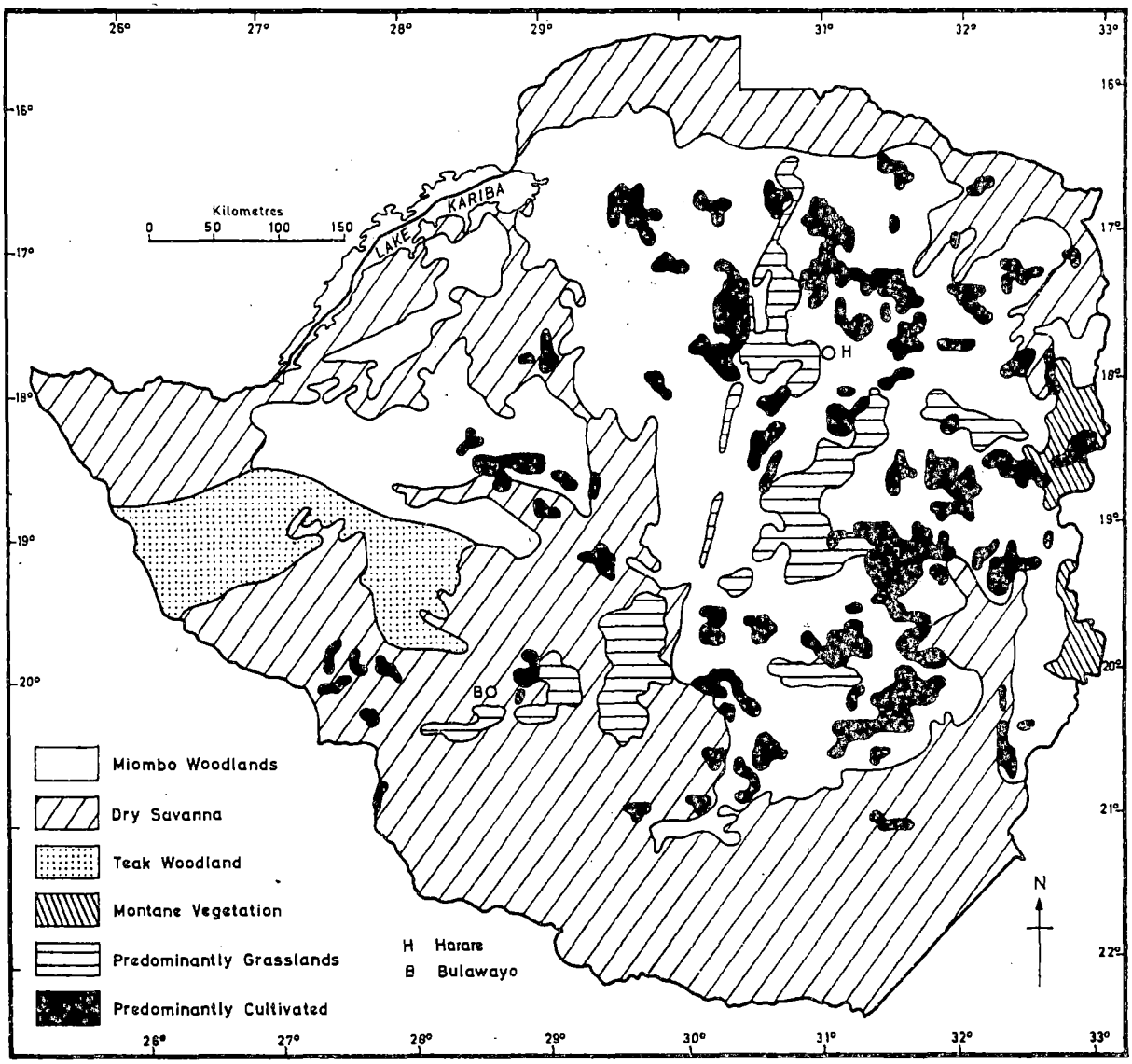
Fig. 1: Vegetation cover types in Zimbabwe



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