



INTRODUCTION: *context and early beginnings*



Namibia may not seem like a place with many plants, at least compared to lots of other places on earth. However, about 4,000 species of plants have been identified in the country. Approximately three-quarters (76%) are forbs (more usually called herbs or herbaceous plants), 10% are grasses, 2.3% are mosses and liverworts (bryophytes) and 1.6% are ferns. The remaining 10% of species are the woody trees that form the subject of this book. What, however, is a tree? The definition adopted here is the one used by the *Tree Atlas of Namibia*¹ as any woody plant, including shrubs, that usually grows to a height of one metre or more. The focus here is on woodiness, an emphasis that is appropriate because wood has traditionally been the major interest of the forestry sector.



By day or night, Baobab trees are perhaps the most impressive of about 400 plant species defined as trees in Namibia.

This leads to the question of what constitutes a forest. The Food and Agriculture Organization of the United Nations (FAO) defines forests as land covered by trees with a canopy cover of more than 10% and higher than five metres. A forest should extend over more than half a hectare, and includes plantations and stands of young indigenous trees that are expected to develop into taller groves. An accurate assessment of land cover has yet to be done, and so it is hard to estimate what proportion of Namibia is forested in FAO terms. However, Figure 1 shows areas that probably have a canopy cover of more than 10% and thus qualify as forest. Most of these areas are in north-eastern Namibia, especially in eastern Caprivi, western Kavango, eastern Ohangwena and in the hills around Tsumeb, Otavi and Grootfontein. More open woodlands lie to the west and south of the forested area, while shrubland and desert covers the most western and southern parts of the country.

As a term, woodland is much broader and includes landscapes which are not forests but where reasonably tall trees are conspicuous.² Shrubland, on the other hand, consists largely of shrubs, perhaps with the odd scattered tree. Savannas are really woodlands, but with a characteristic and prominent grass layer under a stratum of fairly widely spaced trees that often gives the appearance of open parkland. A range of environmental factors – operating alone and in combination – determine the structure and composition of plants in any one place. The most important of these factors are aridity, soils and fire. It is they that affect the mix of grasses, shrubs and trees, and that make an area a forest, woodland, shrubland or desert. Chapter 2 offers a review of these factors and their effects.

So far we have been concerned largely with biological definitions that distinguish woodlands from forests. But there is a subtler set of implications in the book's title *Forests and woodlands of Namibia*. As will become apparent in the chapters on the uses and management of these resources, priorities are changing. The official champion of trees in Namibia is the Directorate of Forestry, an organization that has largely been concerned with wood production, either from indigenous trees or exotic plantations. This is what forestry has conventionally been about, and this is partly why forests are defined as consisting of trees that are at least five metres tall. However, timber resources in Namibia are extremely scarce, and cheaper wood and substitute chipboards can be readily imported. Foresters are thus increasingly changing their focus away from forests to woodlands. Put another way, the switch is from timber products to non-timber forest products, and other indirect uses of woodlands widely known as NTFPs. These are useable natural resources that can be found arguably almost anywhere. And if the importance of NTFPs is advocated, then more emphasis on woodland habitats is needed and perhaps less on forests and wood. So where is the focus, what comes first: forests or woodlands, especially if it is difficult to see the wood for the trees, as the saying goes?

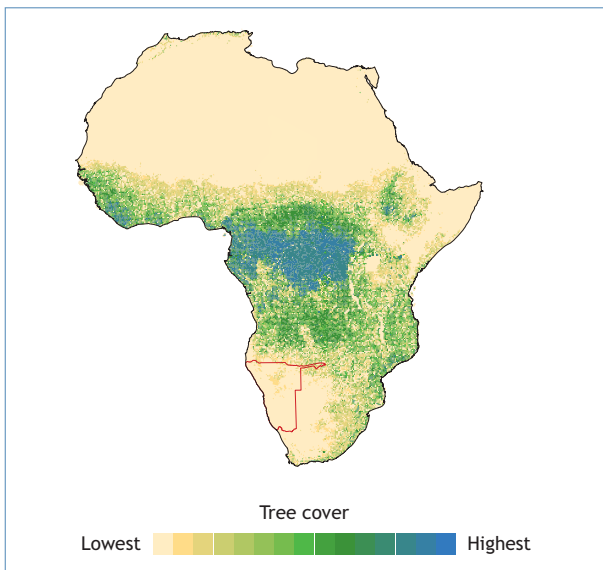
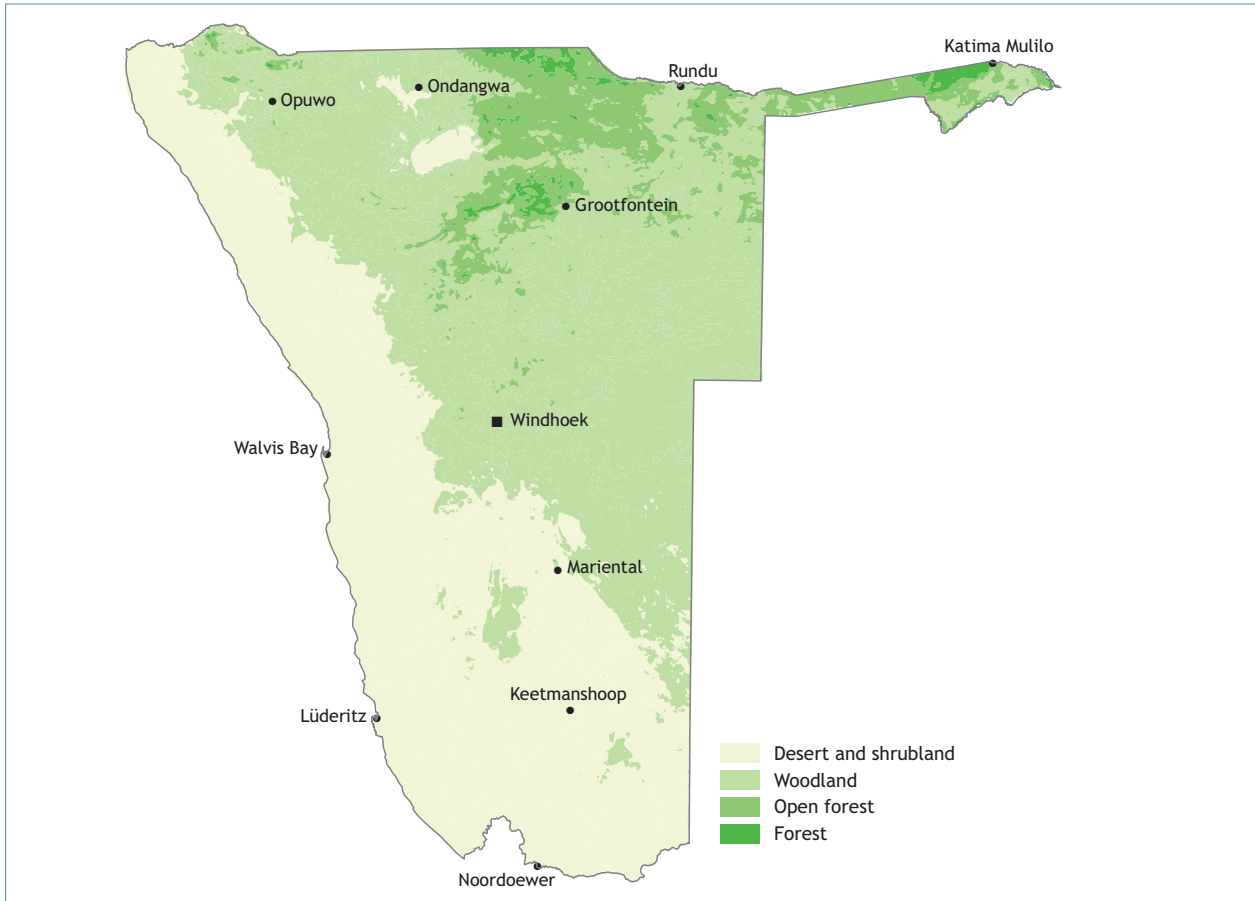


Figure 1. The approximate distribution of forests and woodlands in Namibia. Forested areas make up less than 10% of the country, while woodlands cover approximately 50% and shrub-land and desert the remaining 40%. The smaller map provides a comparative perspective on the distribution of tree cover on the African continent.³





Namibian trees come in diverse shapes and sizes: tall and broad-leaved, gnarled and thorny, succulent, squat and bulbous, very thorny, papery-barked, and resplendent in vivid colour. From top left to bottom right: Kaoko Kobas, Omutenge, Burkea, Camel Thorn, Shepherd's Tree, Quiver Tree and Makalani Palm.



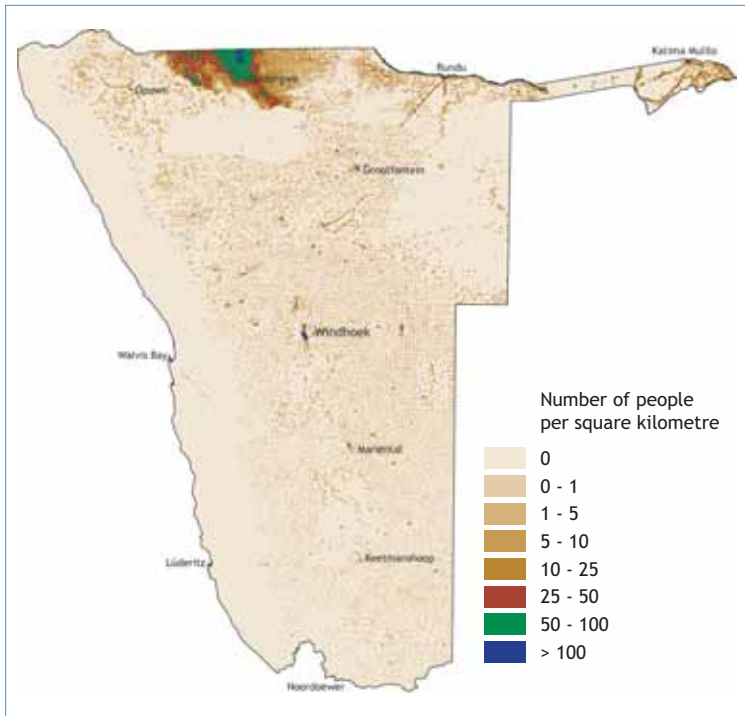


Figure 2.
The distribution of
people in Namibia.⁴

THE GEOGRAPHY OF NAMIBIA

Namibia's surface covers an area of about 823,680 square kilometres. Its western border is formed by the Atlantic Ocean, a coastline of approximately 1,570 kilometres. The total population of an estimated two million people in 2005 is spread very unevenly across the country. Urban areas are growing rapidly as more and more people leave their rural homes. About 40% of people live in towns and the great majority of the remaining rural population resides in the northern, more wooded regions of Caprivi, Kavango, Ohangwena, Oshikoto, Oshana and Omusati (Figure 2). Most of the population is young. For example, 43% of all Namibians are under the age of 15 years. Population growth rates have dropped over the past 15 years – from about 3% to 2.6% per year – as a result of fewer births and lower life expectancies caused by AIDS deaths. The country is home to diverse cultures and languages, especially in the northern regions where most of the 25 distinct languages or major dialects are based.

Although large parts of the country are uninhabited, all land is allocated for one use or another (Figure 3). Approximately 43% of Namibia is now allocated as freehold land, 37% as communal land, and 20% as government land. Freehold land is mainly used for commercial livestock and tourism, while most government areas are set aside for conservation, farming and resettlement. Communal land is used largely for small-scale farming (each unit comprising several hectares), large-scale farming (each farm generally covering several thousand hectares), or open access grazing. Communal land is formally owned by the state but farmers have traditional and permanent rights to its use. The livelihoods of most Namibians depend directly or indirectly on indigenous natural resources, and much more land is thus used for agriculture than other purposes. The main crops of millet, sorghum and maize are cultivated on about 3,000 square kilometres, while other farmland is used for livestock and game production.

Geologically, the country is broadly divided in two halves. The western half is characterized by diverse rock features, which are largely exposed at the surface in rugged landscapes of valleys, escarpments, hills and expanses of plains. Most of these geological formations formed hundreds of millions of years ago. The surface of the eastern half, by contrast, is rather flat and almost completely covered by sand and scattered water-borne sediments deposited much more recently during the past few million years. A crucial consequence of the predominance of exposed rock in the western half and sand in the east is that soils in most areas are generally shallow, low in nutrient content and poor in retaining soil moisture.

The majority of soils are thus poorly suited to plant growth. Limits on plant growth are exacerbated by severe climatic conditions, especially low rainfall, high temperatures and high rates of evaporation. More information on these aspects is provided in Chapter 2, pages 27-36. The arid climate is a result of Namibia lying along the edge of south-western Africa where it is placed between two climate systems: the Inter-tropical Convergence

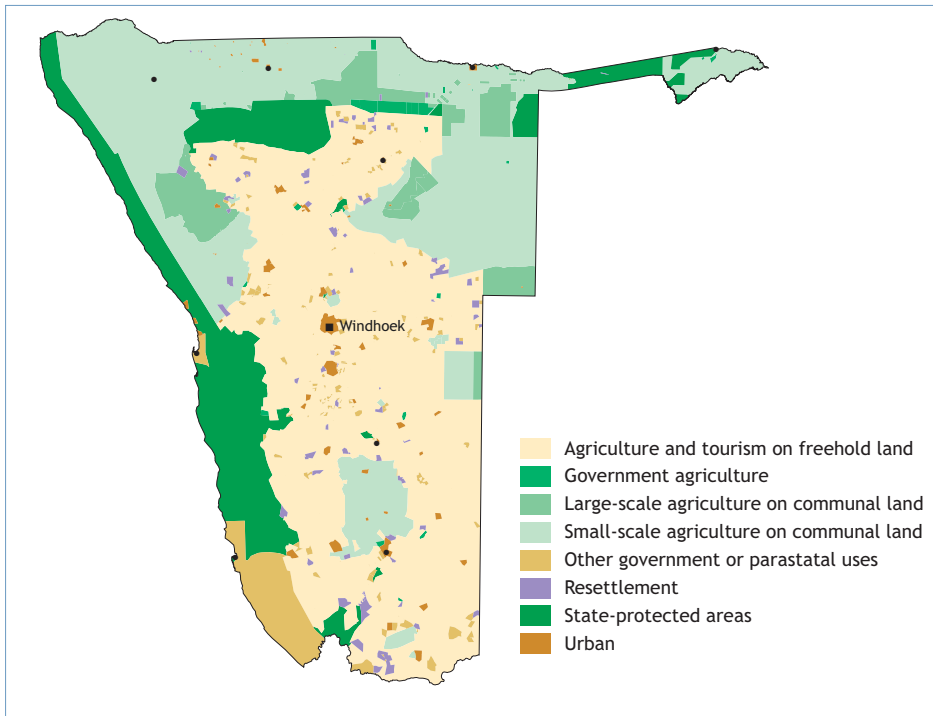


Figure 3.
The major uses of
land in Namibia.⁵

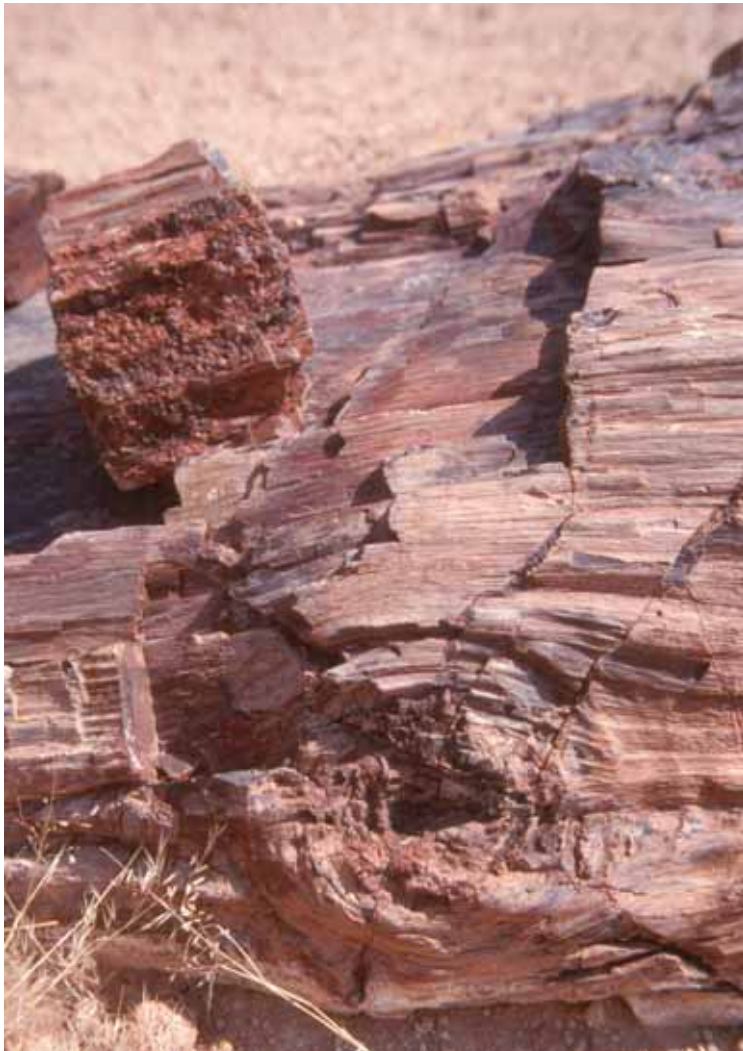
Zone (ITCZ) and the Subtropical High Pressure Zone. The ITCZ feeds moist air southwards from the tropics and Indian Ocean, while dry, cooler air from the Subtropical High Pressure Zone to the south pushes the tropical moist air away to the north. Dry air from the latter system dominates the weather for much of the year. Consequently, there are few clouds, humidity is low, solar radiation is intense, temperatures are often high, and water (including soil moisture) evaporates rapidly. As a result of the low rainfall, very few of the rivers carry permanent water. There are only six such perennial rivers, all of which flow largely along the country's borders: the Zambezi, Chobe, Kwando-Linyanti, Okavango, Kunene and Orange Rivers. All other rivers within the Namibian borders are ephemeral, with sporadic flows, or fossil rivers that have not flowed for any distance in recent decades.

A BRIEF HISTORY OF FORESTRY

The history of forestry in Namibia can be divided into three periods, corresponding to the three

governments to have administered the country. Each period was characterized by strong foreign influences: from the German and South African administrations and then by development advisors working with the Namibian government since 1990. The first two periods are ably reviewed in the book *Forestry in Namibia: 1850-1990*⁶, from which much of the material in this section is derived.

Formal forestry activities really began in 1894 when a small area near Windhoek was cleared to grow trees experimentally. Kurt Dinter, a well-known botanist after whom several Namibian plants were named, was appointed in 1900 in a forestry post at the Brakwater Forest Station, which was Namibia's first forest station. However, the station moved to Okahandja in 1901 when Dr Gerber became the first Chief Forestry Officer. He divided the country into four administrative forestry districts: Windhoek, Okahandja, Otavi and Keetmanshoop. Each district had a forest station, with the forestry headquarters in Windhoek. This



*Coniferous trees were apparently swept down a river and left to form the famous Petrified Forest to the west of Khorixas. The trees, belonging to the seven species collectively known as *Dadoxylon arberi* Seward, were fossilized between about 250 and 270 million years ago. Some of the trunks are up to 45 metres in length.*

zonation reflected the German administration's lack of interest in woodland or forest resources in the northern areas of the country. Officials instead focused heavily on how to meet demands for wood by German settlers and the developing infrastructure, such as railways and mines.

Two strategies were adopted to supply wood: importation of wood and cultivation of suitable timber species. Much of the administration's efforts settled on the latter option. By 1910, ten forest stations and nurseries had been established to supply seedlings to farmers and to test species that

could be grown to supply wood. A total of 201 species, subspecies and varieties was propagated at the nurseries, of which 23 were indigenous to Namibia. Exotic seeds were mainly imported from South Africa and Germany, with *Eucalyptus* and *Casuarina* trees favoured as having the greatest potential. The first *Prosopis* (or Mesquite) were grown in the Windhoek nursery in 1905.

While German policy and activities were devoted mainly to increasing the supply of wood, the administration was also concerned with issues of woodland loss and over-exploitation, particularly around settlements and along riverbanks. The concern went hand in hand with the theory that the local climate and fertility of the soil could be improved if there were more trees in the country. In 1894, an ordinance was issued to restrict the cutting of trees in the Windhoek district. This was followed in 1900 by another regulation on the felling of trees for domestic and commercial use, and yet another ordinance in 1914 that gave farmers more freedom to use wood for their own consumption but not for commercial logging.

German forestry policies were evaluated in 1908 as being too expensive and ineffective. As a solution, it was recommended that the task of planting trees be shifted to private farmers with the motivation that this would enable farmers to increase their income. In a sense, these recommendations mirror some of the thinking behind the introduction of community forestry in Namibia about 80 years later, as discussed in Chapter 4.

South Africa assumed control of Namibia in 1915, and was given a mandate to administer the country in 1920. Little interest was shown in forestry until 1926, when the South African forestry expert, J.D.M Keet, was sent to evaluate aspects of the sector. Among the main findings of his work was the conclusion that the increasing demand for fuel and fencing wood could not be met from local trees. His report further warned against the establishment of large plantations of exotic trees, particularly those with rapid transpiration rates (such as *Eucalyptus*), which might lower the levels of valuable underground water reserves.



For the first time, attention shifted towards timber production in Caprivi, Kavango and the former Owambo region. Indeed, commercial aspects of forestry were to remain at the forefront of policy and practice throughout the 75-year South African administration which ended with independence in 1990. The first permit to cut 1,000 trees in Kavango was issued in 1933. Figures on annual timber harvests have not been collated, an almost impossible task because large volumes were evidently harvested illegally. Nevertheless, it appears that harvests increased substantially after the Second World War, both as a result of rising demand for timber and improved access to wooded areas in the northern regions. Logging perhaps reached a peak in the late 1960s and early 1970s

when, for example, 28,000 cubic metres were harvested in the first nine months of 1972 in Kavango and the former Owambo and Bushmanland (now north-eastern Otjozondjupa) areas. In 1990, by contrast, only 8,850 cubic metres were harvested in these areas and in eastern Caprivi. Three sawmills were then in operation: at Katima Mulilo, Rundu and Tsumkwe.

Large volumes of wood had been harvested around Grootfontein, Tsumeb and Otavi for fuel and props at local mines from the early 1900s onwards. Demand and harvesting rates increased as the mines were deepened and more prop support was needed. Again, systematic figures on the volumes are not available, but the harvests were large, at least in relation to what was available.

Pupils at the Ongwediva Industrial School practice sawing logs in 1930, reflecting the then predominant interests of foresters in producing timber from tall deciduous trees in northern Namibia.



Young trees being prepared for transport at the Windhoek Forest Station in 1913. The German administration was primarily interested in propagating trees to meet demands for wood.

Tamboti was preferred for props, and a 1954 report concluded that over-exploitation of these trees had led to serious bush encroachment around Tsumeb. Annual harvests at Tsumeb in the mid-1920s were reported as being about 2,700 cubic metres, while in the 1950's they had risen to approximately 13,000 cubic metres per year. Most of this was Tamboti.

The experimental growth trials and forestry stations established by the German administration were largely abandoned or neglected during the South African period. Only the Okahandja Railway Nursery remained functional until the 1950s, although three more nurseries were later started and remained operational at independence. These were at Katima Mulilo, Grootfontein and Ondangwa. A number of plantations were established over the years near Tsumeb to supply the mines with Eucalyptus poles for props. For example, 65,000 seedlings were planted in 1954 near Lake Oshikoto. However, all these plantations were poorly maintained and later abandoned.

Several small trial plantations were established between the 1960s and 1980s in the northern regions (see page 54). Most other research activities

during South Africa's tenure focussed on timber resources in Kavango and Caprivi. These included the mapping of woodland types and potential timber resources, and estimation of timber volumes and growth and regeneration rates. Forest resource management plans were completed for East Caprivi and Kavango in 1968 and 1975, respectively.⁷

Two important pieces of forestry legislation were promulgated during the South African period: the *Preservation of Trees and Forests Ordinance of 1952* and the *Forest Act of 1968*. Both emphasized aspects of control and regulation of logging, but also provided for various conservation objectives. These included the special protection of 23 tree species in 1952, and the establishment of nature reserves and protected forest areas in 1968. Other than its focus on commercial harvesting of timber, the South African mandate was characterized by a minimal presence of forestry administration. The magistrate at Grootfontein and the Native Commissioners of Kavango and former Owamboland issued all harvesting permits. They often had little idea of what was acceptable forestry practice, and lacked measures to supervise or control harvesting. Matters improved in 1957 when P.J. le Roux was appointed as the first Regional Forestry Officer in Grootfontein. In later years, foresters were appointed to the ethnic administrations of Caprivi, Kavango and former Owamboland. They were administered by the Department of Agriculture in Windhoek, while all commercial aspects of forestry were run through the forestry office in Grootfontein where three foresters were stationed until independence in 1990.

INDEPENDENT NAMIBIA

South Africa's minimalist approach meant that the forestry enterprises and administration inherited by Namibia at independence were tiny. Much of the past 15 years has been spent building a forestry sector, especially the Directorate of Forestry as an institution to a point where it had 646 posts by the end of 2004, of which 38 are for professional foresters. Many of these people were specifically sent to foreign universities for training as foresters.

The Directorate now has offices in 34 places across the country. A great deal was also done to develop policy and strategy, which were laid out in detailed policy statements in 1992, 1996, and 2001. The development of a policy framework finally resulted in the promulgation of the *Forestry Act of 2001*. Much of all this development work was based on financial support and technical advice from various donor support programmes. Chapter 4 provides more information on the management of forestry.

The German administration was largely concerned with finding ways of providing wood while the South Africans concentrated mainly on commercial harvesting of timber in northern Namibia. Where is the focus in independent Namibia? Perhaps the most important shift has been towards community-based forest management, and the sustainable use and conservation of forest and other woodland resources, especially in extensive areas of rural, communal land. This presents an interesting challenge, since it is true that Namibian forestry activities over the past century have largely concentrated on small, select patches of plantations and timber. Most woodland has not been managed in any direct way. This applies to almost all farmland and also to game reserves and national parks. Namibian trees have largely been left to their own devices, although they are greatly affected by land uses, as described in Chapter 5. Will the new approach to community-based management and resource utilization work, and can it be extended to other categories of land tenure and use?

NAMES

Making a choice about what names of trees to use in this book was difficult. Botanists much prefer scientific Latin names, but these are unfamiliar to most lay people. Moreover, many trees do have familiar vernacular names, and many more people are comfortable with Mopane and Camel Thorn than with *Colophospermum mopane* or *Acacia erioloba*. Our choice was to use common names throughout, even though some names are not well known. Contrary to normal practice, the names are capitalized to reflect their status as pronouns



and to lift their prominence in the flow of text. The table below lists all the names used together with their scientific equivalents. The names used are largely the same as those used in the *Tree Atlas of Namibia*.

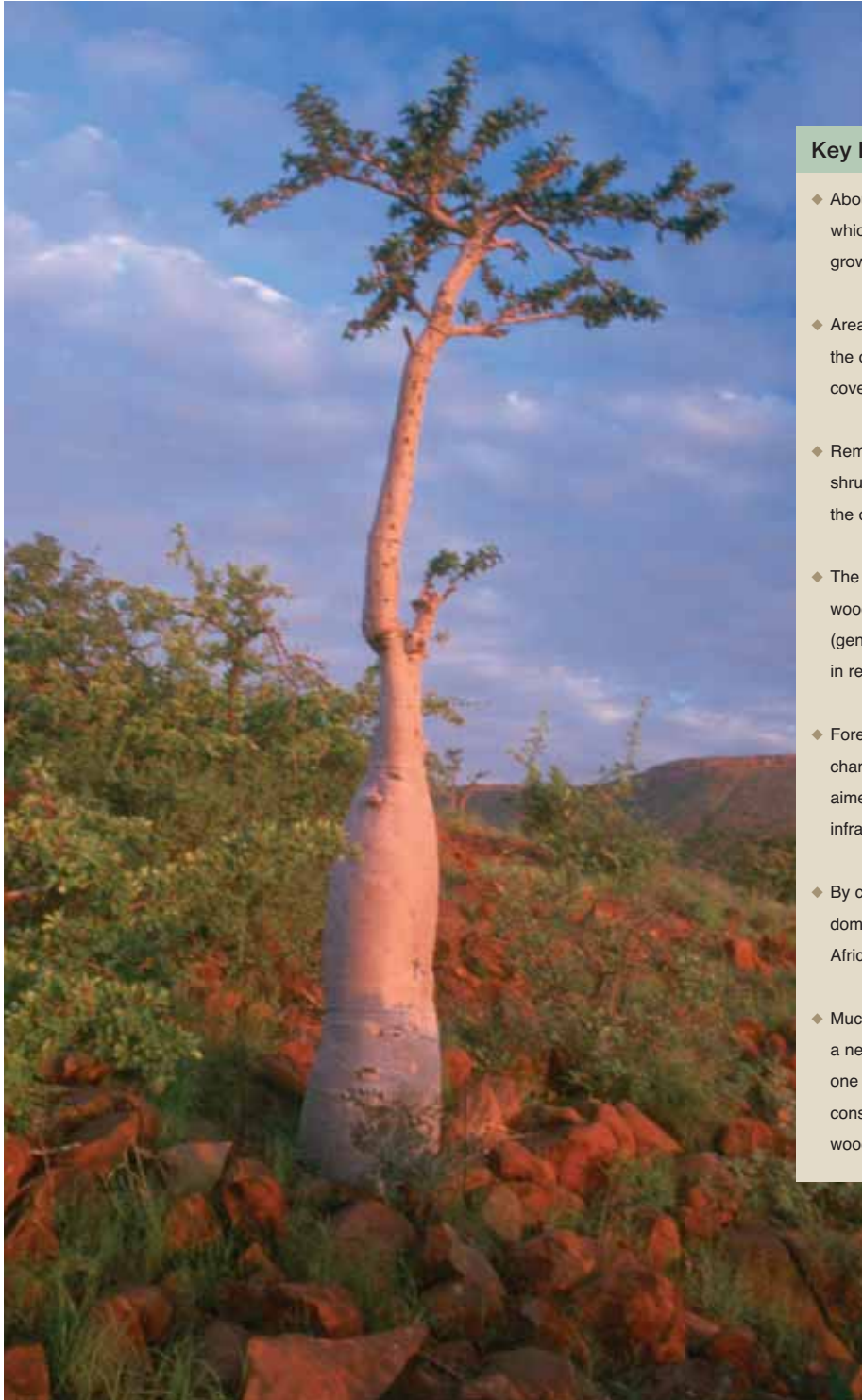
Wood has always been a crucial resource, for example in supporting huge omashisha baskets used to store surplus harvests or for mortars and pestles used to pound grain.

Name used in this book Latin or scientific name

!Nara	<i>Acanthosicyos horridus</i>
African White Protea	<i>Protea gaguedi</i>
Ana Tree	<i>Faidherbia albida</i>
Apple-leaf	<i>Philenoptera violacea</i>
Baobab	<i>Adansonia digitata</i>
Bergdorn	<i>Acacia hereroensis</i>
Bergsering	<i>Kirkia acuminata</i>
Bird Plum	<i>Berchemia discolor</i>
Black Thorn	<i>Acacia mellifera</i>
Blue Sourplum	<i>Ximenia americana</i>
Brandberg Acacia	<i>Acacia montis-usti</i>
Buffalo Thorn	<i>Ziziphus mucronata</i>
Burkea	<i>Burkea africana</i>
Camel Thorn	<i>Acacia erioloba</i>
Camphor Bush	<i>Tarchonanthus camphorates</i>
Candle-pod Acacia	<i>Acacia hebeclada</i>
Casuarina	<i>Casuarina species</i>
Corky Monkey-orange	<i>Strychnos cocculoides</i>
Devil's Claw	<i>Harpagophytum procumbens</i>
Driedoring	<i>Rhigozum trichotomum</i>
Giant Quiver Tree	<i>Aloe pillansii</i>
Guava	<i>Psidium guajava</i>
Hoodia	<i>Hoodia currorii</i>
Jackal Berry	<i>Diospyros mespiliformis</i>
Kalahari Melon	<i>Citrullus lanata</i>
Kalahari Podberry	<i>Dialium engleranum</i>
Kaoko Kobas	<i>Cyphostemma uter</i>
Karee	<i>Rhus lancea</i>
Kiaat	<i>Pterocarpus angolensis</i>
Knob-thorn	<i>Acacia nigrescens</i>
Kobas	<i>Cyphostemma species</i>
Kudu Bush	<i>Combretum apiculatum</i>
Laventelbos	<i>Croton gratissimus</i>
Leadwood	<i>Combretum imberbe</i>
Lekkerbreek	<i>Ochna pulchra</i>
Makalani	<i>Hypheane petersiana</i>
Mangetti	<i>Schinziophyton rautanenii</i>
Mango	<i>Mangifera indica</i>
Mangosteen	<i>Garcinia livingstonei</i>
Marula	<i>Sclerocarya birrea</i>
Mobola Plum	<i>Parinari curatellifolia</i>
Monkey-oranges	<i>Strychnos species</i>
Mopane	<i>Colophospermum mopane</i>
Mukondekonde	<i>Friesodielsia obovata</i>

Name used in the book Latin or scientific name

Mupako	<i>Erythrophleum africanum</i>
Musese	<i>Albizia versicolor</i>
Namaqua Rock Fig	<i>Ficus cordata</i>
Namibian Resin Tree	<i>Ozoroa crassinervia</i>
Natal Mahogany	<i>Trichilia emetica</i>
Neem	<i>Azadiracta indica</i>
Omundjimune	<i>Lannea discolor</i>
Omutenge	<i>Commiphora anacardiifolia</i>
Peter's Fig	<i>Ficus petersii</i>
Pod Mahogany	<i>Azelia quanzensis</i>
Propeller tree	<i>Gyrocarpus americanus</i>
Prosopis	<i>Prosopis species</i>
Purple-pod Terminalia	<i>Terminalia prunioides</i>
Quiver Tree	<i>Aloe dichotoma</i>
Raisin bush	<i>Grewia species</i>
River Rhus	<i>Rhus quartiniana</i>
Rooihaak	<i>Acacia reficiens</i>
Sand-veld Acacia	<i>Acacia fleckii</i>
Sausage Tree	<i>Kigelia africana</i>
Shepherd's Tree	<i>Boscia albitrunca</i>
Sickle-bush	<i>Dichrostachys cinerea</i>
Sickle-leaved Albizia	<i>Albizia harveyi</i>
Silver-leaf Terminalia	<i>Terminalia sericea</i>
Spiny Monkey-orange	<i>Strychnos spinosa</i>
Spiny-leaved Monkey-orange	<i>Strychnos pungens</i>
Sweet Thorn	<i>Acacia karroo</i>
Sycamore Fig	<i>Ficus sycomorus</i>
Tamboti	<i>Spirostachys africana</i>
Umbrella Thorn	<i>Acacia tortilis</i>
Ushivi	<i>Guibourtia coleosperma</i>
Variable Combretum	<i>Combretum collinum</i>
Velvet Wild Medlar	<i>Vangueria infausta</i>
Water Pear	<i>Syzygium guineense</i>
Welwitschia	<i>Welwitschia mirabilis</i>
White Karee	<i>Rhus pendulina</i>
White Puzzle-bush	<i>Ehretia alba</i>
Wild Ebony	<i>Euclea pseudebenus</i>
Wild Tamarisk	<i>Tamarix usneoides</i>
Wild Tobacco	<i>Nicotiana glauca</i>
Wild Willow	<i>Salix mucronata</i>
Wonderboom	<i>Leucaena leucocephala</i>
Yellow-bark Acacia	<i>Acacia erubescens</i>
Zambezi Teak	<i>Baikiaea plurijuga</i>



Key Points

- ◆ About 10% of all plant species in Namibia are trees, which are considered to be woody plants that normally grow to one metre or more in height.
- ◆ Areas defined as forests cover just less than 10% of the country. This is land covered by trees with a canopy cover of more than 10% and higher than five metres.
- ◆ Remaining areas of woodland, and desert or shrubland cover approximately 50% and 40% of the country, respectively.
- ◆ The most important geographical features to affect woodlands and forests in Namibia are its soils (generally shallow, low in nutrients or poor in retaining water), the arid environment and fire.
- ◆ Forestry during the German administrative period was characterized by experimentation and development aimed at meeting demands for wood needed for infrastructure development and by settler farmers.
- ◆ By contrast, commercial aspects of timber harvesting dominated policy and practice during the South African administration.
- ◆ Much of the past 15 years has been spent establishing a new policy and institutional framework for forestry, one that focuses on community-based management, conservation and use of indigenous forest and woodlands resources.