

Monograph on
**Endemism in the
Highlands and Escarpments
of Angola and Namibia**



Angola Cave-Chat *Xenocopsychus ansorgei*
Photo: M Mills

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The human environment in the highlands and escarpments of Angola and Namibia

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ABSTRACT

The distribution and density of people in the highlands and escarpments of Angola and Namibia (HEAN) is largely a product of proximity to urban areas, climate and soil fertility. The highest rural densities in HEAN are in central Angola, and the lowest in southern Namibia. In northern and central Angola most rural households grow crops for domestic consumption and sale, whereas pastoralism prevails in the HEAN areas of southern Angola and northern Namibia. Remittances, social grants and revenues from tourism provide most household income in northern Namibia. Angola is divided and administered via provinces, *municípios* and *comunas*, whereas Namibia is administered through regions and local authorities for urban areas. Shifting cultivation has led to the clearing of large areas of forest, woodland and grassland. Other major human impacts are the harvesting of trees for charcoal and timber, the hunting of wildlife for the sale of bushmeat, soil erosion, and the loss of forests and woodlands and soil nutrients as a result of frequent fires.

Keywords: Angola, cultivation, deforestation, escarpments, fire, highlands, land uses, livelihoods, Namibia, people

INTRODUCTION

The distribution of people, land uses and sources of income in the highlands and escarpments of Angola and Namibia (HEAN) vary considerably, in particular from north to south. In the northern areas, rainfall is highest, evaporation is lowest, soils are more fertile and access to urban markets is relatively easy. This is where most people live and grow crops, and where the loss of natural resources is greatest. Many people there also live in large towns such as Uíge, Gabela, Cuito, Huambo and Lubango. By contrast, few crops are grown in the southern arid areas where soil nutrients are scarce. With the exception of Otjiwarongo and Windhoek, towns and settlements are small, and the majority of rural people make a living from livestock, labour on farms and mines, and tourism.

DISTRIBUTION OF PEOPLE

The major differences in climate and soil types between Angola and Namibia have significant effects on their populations: Angola's population census in 2014 counted 25,789,024 people (Instituto Nacional de Estatística 2016), about 12 times more than the 2,113,007 people counted in Namibia's 2011 census (Namibia Statistics Agency 2011), yet Angola's land mass of 1,246,700 km² is only 1.5 times larger than Namibia's 824,300 km². Population densities are therefore much greater in Angola than in Namibia, but both countries have enormous variation in population density, ranging between the massive city of Luanda with close to 10 million people to the vast

expanses of desert and mostly inert Kalahari sands which are virtually devoid of humans (Figure 1).

Urban populations in Angola and Namibia have grown rapidly, with the majority of growth being in unserviced informal settlements. The rates of annual urban population growth in Angola over the past 60 years is estimated to be 4.8% (Instituto Nacional de Estatística 2016), and about 4% over the same period in Namibia (Atlas of Namibia Team 2022). Angola's urban residents accounted for 73% of the national population in 2014, while the corresponding proportion in Namibia was 52% in 2020. A range of conditions prompt people in both countries to leave rural areas, especially the lack of incomes, services and basic goods, while other conditions attract them to urban areas, in particular jobs and other potential sources of incomes, services and the allure of modern 'civilisation' (Jenkins *et al.* 2002, Gomes 2012, Calunga *et al.* 2015).

ADMINISTRATIVE AREAS

Angola is divided into three administrative levels, from biggest to smallest: *provincia* (Figure 2), *município* and *comuna*. Namibia is split into regions for purposes of local administration, which are further divided into constituencies; these are political rather than administrative units. Urban areas are administered by local authorities in both countries. Namibian rural areas are divided into surveyed freehold land and communal land. Rights to land and its natural resources in both Angola and Namibia are theoretically controlled by traditional authorities.

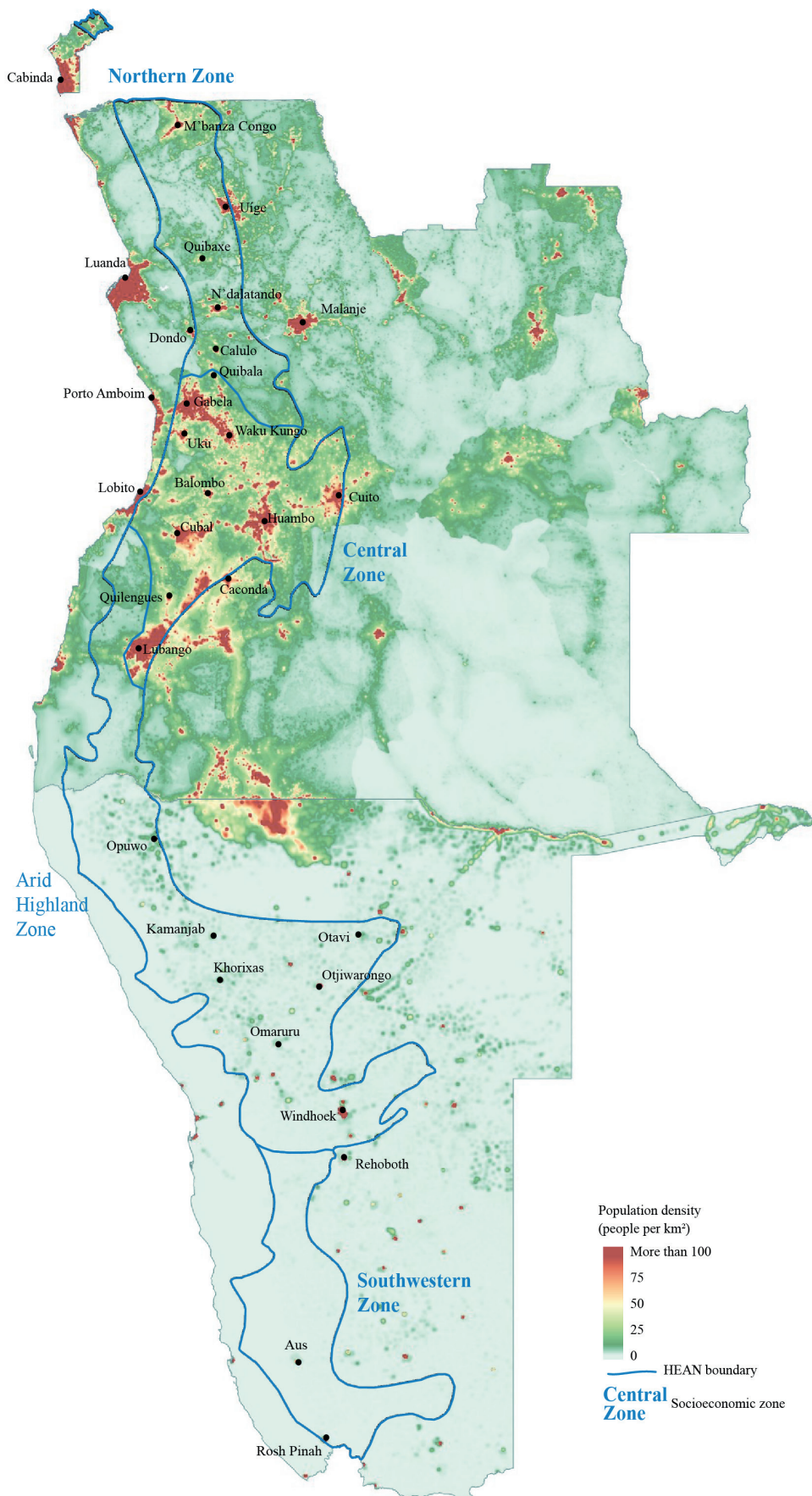


Figure 1: Human population density and four socioeconomic zones in Angola and Namibia. The highlands and escarpments of Angola and Namibia (HEAN) and socioeconomic zones are in blue. Sources: Angola population density for 2020 from WorldPop (2023), and for Namibia from Atlas of Namibia Team (2022).

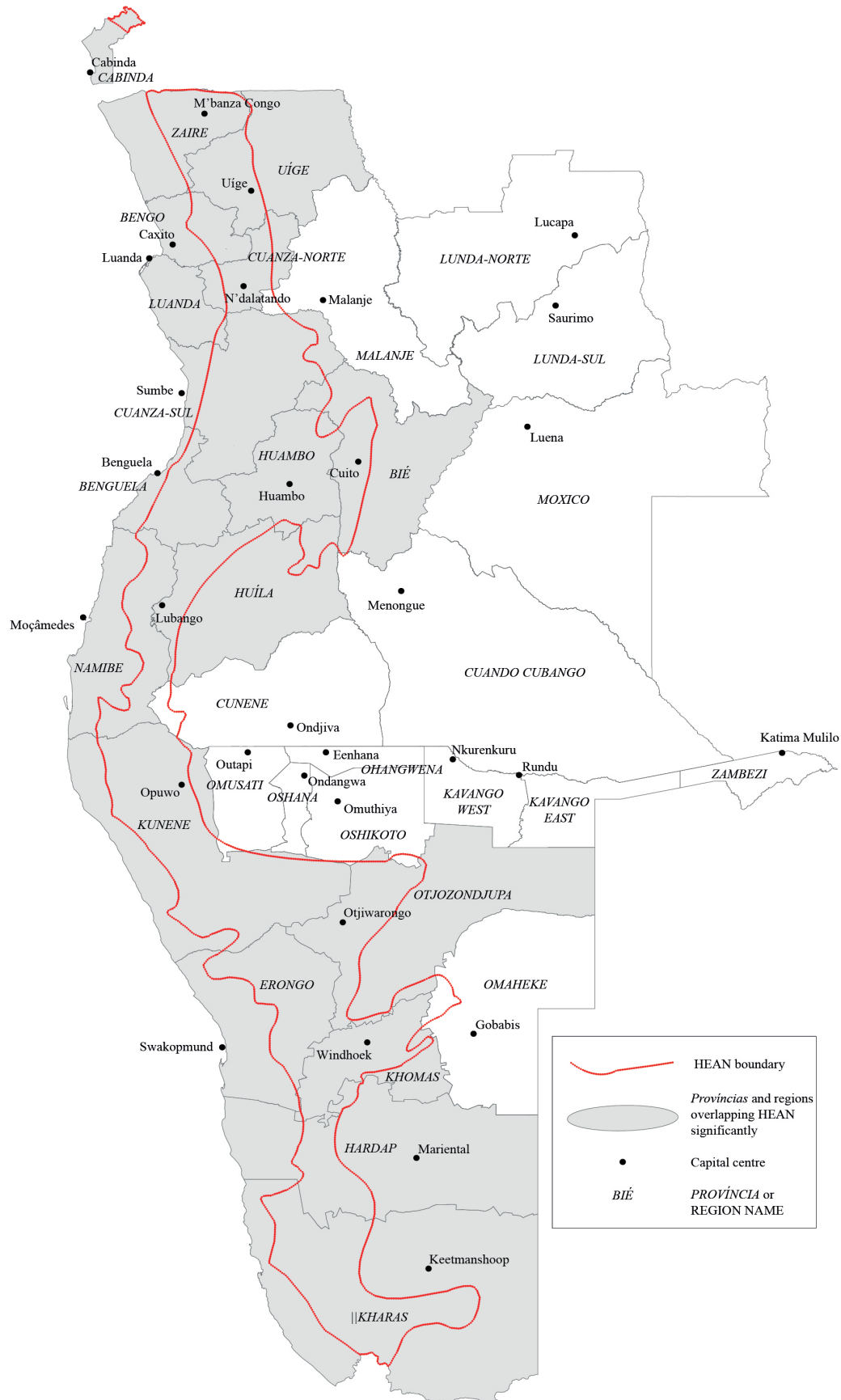


Figure 2: The highlands and escarpments of Angola and Namibia (HEAN) in relation to Angola's provinces and their capitals, and Namibia's regions and their capitals. Administrative areas that overlap significantly with HEAN are shaded grey.

However, the extent and nature of control is often weak with the result that large areas of land have been appropriated for grazing or expropriated for exclusive use by people who live in urban areas (Cain 2019, Atlas of Namibia Team 2022).

RURAL ECONOMIES, LAND USES AND SOCIOECONOMIC ZONES

Types of livelihoods across the highlands and escarpments can be grouped into four rather distinct socioeconomic zones which are described below: Northern Zone; Central Zone; Arid Highland Zone; Southwestern Zone (Figure 1). The four socioeconomic zones described here correspond largely to the physical landscapes described by Mendelsohn & Huntley (2023). Thus:

- *Northern Zone* ≡ Northern Escarpment
- *Central Zone* ≡ Marginal Mountain Chain, Central Escarpment and Angolan Planalto
- *Arid Highland Zone* ≡ Southern Escarpment, Karstveld, Central-Western Plains and Khomas Hochland
- *Southwestern Zone* ≡ Pro-Namib and Nama Karoo Basin.

Throughout the HEAN on average, rural households are larger and poorer than their urban counterparts, and adults in rural areas have had fewer years of formal education than adults in urban areas. In Angola, most household income in rural areas comes from the sale of charcoal, bushmeat, fish, crops (especially vegetables) and poultry. By contrast, most rural households in Namibia derive their incomes from social grants, remittances, local retail trade and wildlife and livestock products. Smallholder crop farmers usually retain staple foods that can be stored for long periods for domestic consumption, whereas

soft vegetables and other products that decay quickly are normally sold to generate income.

Several major changes in rural economies – and therefore land uses – have occurred during the past 60 years. These include the introduction of incomes from wildlife and tourism and the concurrent reduction in livestock production in many parts of Namibia. In Angola exports of coffee and maize have declined, but local trade and sales of charcoal, vegetables and bushmeat have increased. Extraction of timber by commercial companies has contributed to the rapid deforestation of mature tropical rainforest and biodiversity loss in Bengo, Uíge and Cuanza-Norte provinces (see below, and Lautenschläger *et al.* 2023).

With increasing demands for income security – rather than just food security – rapid and efficient transport connections between rural homes and urban areas are increasingly important, giving rural producers access to markets for their crops and natural commodities, such as charcoal and bushmeat (Figure 3), as well as providing rural residents the added ease of purchasing necessities in towns.

Prior to the introduction of cash economies and trade in urban areas, rural populations were largely concentrated along rivers where they had access to water, fish and comparatively fertile alluvial soils. Nowadays, many people continue living near rivers in remote areas of the HEAN, especially in the Arid Highland Zone (Figure 1) where they grow crops in these ephemeral rivers' fertile silt.

Land uses and the distribution and densities of people are strongly related to soil fertility and aridity (Mendelsohn & Huntley 2023), and proximity to roads and urban areas (Figure 1). Thus, densities of



Figure 3: Informal trade in Angola. Left: The roadside market at Mangueiras below the escarpment of Serra da Chela on the main road between Moçâmedes and Lubango. Right: A leopard skin for sale along the same road just west of Humpata. Photos: J Mendelsohn.

people in the central areas of Angola's HEAN are highest because of the wetter and cooler climate, presence of relatively fertile soils and reasonable access to roads and urban markets. Lubango and Huambo, both in this Central Zone (Figure 1), are the largest urban areas in the HEAN. Conditions for farming and human habitation are less conducive in the warmer and more tropical area north of Gabela (Northern Zone), as well as in the increasingly arid area south of Lubango (Arid Highland Zone and Southwestern Zone). The highlands and escarpments of Namibia are divided into a northern arid area and a southern hyperarid area by an approximate boundary between Windhoek and Walvis Bay.

Northern Zone

Much of this zone is in the provinces of Zaire, Uíge, Bengo and Cuanza-Norte. (Technically, the zone also includes Cabinda, but few people live in the forests of Mayombe.) Bakongo people predominate in Zaire and Uíge, and Ambundu people in Cuanza-Norte. Most residents live in rural villages where their farm produce is used for domestic consumption or sold along roads and in local towns. Cassava, maize, beans, sweet potatoes and pumpkins are major staples, supplemented by other cultivated vegetables, and fruit and mushrooms gathered in the wild. In the past coffee was an important cash crop but its cultivation was steadily abandoned due to low prices and high production costs (Bernardo 2012).

Wooded and forested areas in the vicinity of their villages provide rural residents with timber for construction, firewood and medicinal products. Although some areas of forest remain in a relatively undisturbed state, it is likely that timber resources will become scarce in the long term if current rates of depletion continue.

In addition to the clearing of forests and woodlands for shifting cultivation, large-scale timber harvesting occurs in Uíge Province in the municipality of Quitexe and in adjacent municipalities which still have areas of virgin forest (see Lautenschläger *et al.* 2023). Large-scale logging also occurs in Bengo Province in the areas of Nambuangongo, Quibaxe and Bula Atumba (pers. obs.).

Vegetable fields and plantations of beans, maize, banana and other fruits tend to be located on fertile soils along watercourses. Livestock consist mainly of goats, pigs and poultry with their numbers being significantly limited, largely by disease.

Severe soil loss due to erosion gullies has occurred in Uíge Province in the municipalities of Sanza-Pombo, Quimbele and Milunga.

Central Zone

This zone is bounded by Cuito in the east, Gabela in the north, Lubango in the south and coastal lowlands to the west. Apart from Lubango and Huambo previously mentioned, other substantial urban areas are Cachiungo, Caconda, Caluquembe, Cubal and Waku Kungo. Most of Angola's major rivers derive much of their flow from upper catchments in this zone (Lourenco & Woodborne 2023).

Average rainfall ranges between 1,000 and 1,600 mm per year, largely falling in December and March (Mendelsohn & Huntley 2023). Temperatures in these highlands are comparatively moderate (Mendelsohn & Huntley 2023), but often drop to freezing levels – with associated frost – in the early mornings of July and August.

The clearing of woodlands and forests for crops, charcoal and firewood is the most severe environmental problem in the Central Zone. For example, the greater part of Huambo Province and Angola's central plateau, the Angolan Planalto, was originally wooded, with 78.4% of Huambo Province being covered in miombo woodland in 2002. Thirteen years later that proportion had dropped to 48.3%, amounting to the loss of some 1,265,000 ha of woodland cover (Palacios *et al.* 2015).

Significant areas were planted with exotic eucalyptus and pine plantations for timber production during the colonial period, and new areas have been planted in the last decade (pers. obs.).

Other major problems are the loss of soil to erosion, often now evident in gullies big enough to be mapped from satellite images (for example, see Mendelsohn & Mendelsohn 2018).

While most people in this zone live in towns or large villages, many households and smallholder farms are clustered along the major roads that bisect the zone from west to east and from north to south. Agricultural production focuses on dryland crops, mostly of maize, millet, cassava, sorghum and pumpkins. Most vegetables are grown in irrigated *olunaka* fields on patches of fertile, moist Gleysol soils along rivers and their tributaries (Figure 4) and marketed along roads and in nearby towns.

Prior to independence much of Angola's commercial agriculture was concentrated in the Central Zone. This included the production of beef, milk, poultry, fruit, vegetables and maize, the latter being produced largely by smallholders. Most of those commercial ventures ceased during the civil war between 1975 and 2002, but an increasing number have been restarted or developed afresh during the past 15 years, many of them resulting in the clearing of wooded areas or the conversion of grasslands into fields.



Figure 4: An irrigated olunaka field in dark, moist, fertile Gleysol soils alongside a tributary, Huambo Province. Photo: J Mendelsohn.

The largest ethnic groups present in the Central Zone are the Ambundu in the north, the Ovimbundu in the central areas, and the Nyanyeka Humbe people in the southern areas. Portuguese is the lingua franca in urban areas, as is the case throughout Angola.

Arid Highland Zone

This large zone extends from the Humpata Plateau in the east, to the area inland of Dombe Grande in the west, and south into Namibia where it includes a broad area to the east as far as Otjiwarongo and Windhoek. The southern boundary of the zone is approximately east of Walvis Bay (Figure 1). Sub-groups of Herero and Damara people predominate in this area of the HEAN, their principal areas of occupation respectively being north and south of approximately 19° South. Average rainfall varies between about 600 mm per year south of the Humpata Plateau and 300 mm in the southern parts of the zone in central Namibia. The reliability or predictability of rain declines similarly from north to south (Mendelsohn & Huntley 2023).

Except for Windhoek, urban centres in this area are small, such as Oncócuá, Virei, Opuwo, Khorixas, Otjiwarongo and Karibib. Cattle and goats are kept on both communal lands and large, private farms. Charcoal and firewood are sold along major roads and in towns, and are processed for international export. Wildlife has considerable commercial value – for tourism, trophy hunting and venison – in Namibia where many areas are proclaimed conservancies or game farms (Atlas of Namibia Team 2022). Maize, pumpkins, squashes and many other vegetables are grown along larger ephemeral rivers for domestic consumption and sale.

Water is limiting throughout the zone. The west-flowing Cunene River provides the only substantial natural, permanent fresh water. Elsewhere, people, livestock and wildlife obtain water from springs, wells and boreholes.

Rural populations are scattered and small throughout the zone. Permanent settlements are usually located along ephemeral rivers or near boreholes and major springs, almost always in the lowlands that cover much of the area. The few people to be found in the mountain lands are mostly herders of cattle and goats. Livestock in communal areas are moved seasonally or sporadically from depleted to new or more productive grazing. These movements occur within and between Namibia and Angola.

In Namibia, almost the entire western half of the zone is communal land, while the eastern segment largely consists of surveyed, privately tenured farms. Commercial livestock production here has declined in recent decades as increasing numbers of farmers turned to wildlife and tourism, or to holding farms and livestock as capital assets (Atlas of Namibia Team 2022). Rangeland pastures in this area have also shrunk as a result of bush encroachment, a consequence of management and limited fuel loads that curtail the occurrence and frequency of intense wildfires.

Southwestern Zone

Very few people live in this extremely arid area, the great majority of which is conserved in national parks and private nature reserves. These conservation areas generate considerable revenues through tourism.

The reserves were previously farms on which sheep and goats were raised and sold, a farming system that now seldom generates viable incomes. The few farms that continue to produce livestock are large, typically over 10,000 hectares.

Average rainfall ranges between 300 mm per year in the northeastern area of the zone and 100 mm per year further south, but it is always extremely variable. Unlike other areas of the HEAN, the south of the zone receives some rain in winter.

The only urban settlements in this zone are very small: Aus, Helmeringhausen, Rosh Pinah and Sesriem being amongst the biggest. Rural residents typically reside at farmsteads on large farms and at tourist lodges where they are employed. Most residents originate from other areas of Namibia, and only a small number of traditionally resident Nama people continue to live here.

ENVIRONMENTAL CONCERNS

Losses of woodland and forests due to clearing for agriculture (Figure 5) and the harvesting of trees for charcoal are most severe along roads and close to towns in Angola (Mendelsohn 2019). These effects are particularly conspicuous in analyses of woodland and forest loss this century which show how cleared areas around towns have expanded (Schneibel *et al.*



Figure 5: Shifting cultivation in Cumbira, a forested area rich in endemics and proposed for conservation (Vaz Pinto *et al.* (2023), Cuanza-Sul Province. Photo: A Gomes.

2013, 2018). Other negative environmental effects are also concentrated along roads and around urban areas but seldom documented, such as the clearing of natural grasslands, concentrations of waste and the contamination of rivers.

Most clearing of woodland and forest that has occurred in recent decades has been in the Northern Zone, especially in Cabinda and between Uíge town and N'dalatando, and in large areas of the Central Zone. These areas originally had the highest percentage of forest cover in Angola (Figure 6a). Clearing in the Central Zone has largely been for shifting agriculture and charcoal production, whereas woodland and forest loss in the Northern Zone was also caused by timber harvesting. Little clearing is apparent in the southern zones where there is little forest or woodland to clear (Figure 6b).

Rates of clearing for new fields are exacerbated where soils have limited fertility (Asanzi *et al.* 2006, Ucuassapi & Dias 2006, Wallenfang *et al.* 2015) which require farmers to shift their crops to virgin soil once nutrients in existing fields are depleted (Mendelsohn 2019). The relative lack of nutrients and moisture in soils is arguably the most important factor driving the loss of Angolan woodlands and forests. Poor soil quality also slows the rate of plant growth and thus forest recovery.

Fires are frequent and widespread, particularly in the Northern and Central zones where they are most prevalent and influential on plant communities in grasslands and floodplains (Catarino *et al.* 2020, Meller *et al.* 2022). Additionally, intense fires year after year reduce the extent of the woodlands and forests by killing trees on the margins of wooded areas because there is relatively little fuel within woodlands to sustain the intensity of fires. These frequent hot fires have indeed destroyed significant areas of Afromontane forests (Powell *et al.* 2023). The extent to which fires lead to further losses of soil fertility should also be a concern, given the low base of nutrients in most areas of Angola.

The conservation of Angola and Namibia's highlands and escarpments is another concern. Little of the HEAN area in Angola is formally protected, although proposals are being pursued to proclaim several protected areas (Vaz Pinto *et al.* 2023). In Namibia, land managed for conservation falls into five categories: national parks managed by the government; tourism concessions on state land allocated to private enterprises; conservancies and community forests on communal land managed by local residents; and privately owned farms used for wildlife and tourism (Atlas of Namibia Team 2022). Significant localised environmental threats in Namibia are due to prospecting and mining, and the collecting and sale of special, protected plants, such as *Lithops*.

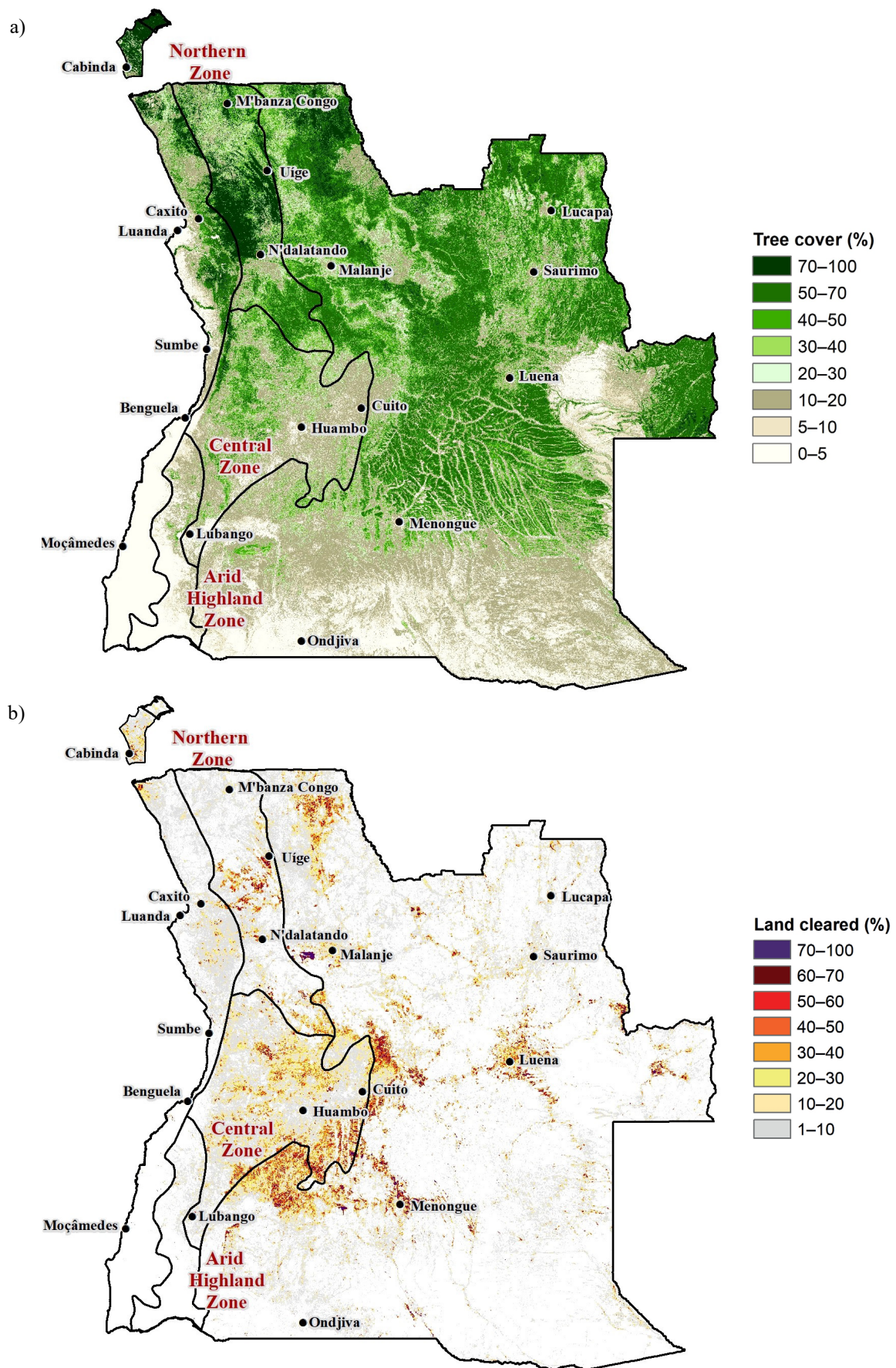


Figure 6: Woodland and forest cover and loss in Angola. a) Cover in 2000. b) Areas cleared of woodland and forest between 2001 and 2021. From the data set developed by Hansen et al. (2013) and updated annually.

Conservancies and community forests have been declared over much of the Namibian part of the Arid Highland Zone, where there are transboundary connections to Angola's Iona National Park. Substantial areas of national parks are present in the Southwestern Namibia Zone.

Regardless of the way land for conservation is promulgated, the effectiveness of conservation management is often limited, especially where rights to land and its natural resources are either vague and/or poorly controlled.

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