

Silva Carelica

37

**LIVING ON THE LAND:
CHANGE IN FOREST COVER
IN NORTH-CENTRAL NAMIBIA 1943–1996**

Antti Erkkilä

ACADEMIC DISSERTATION

To be presented, with the permission of the Faculty of Forestry of
the University of Joensuu, for public criticism in Auditorium C2
of the University, Yliopistokatu 2, Joensuu,
on December 17th, 2001, at 12 noon.

University of Joensuu

Joensuu 2001

Until the 20th century the Owambo communities were separated by forested land (see e.g., Nitsche 1913). In 1866, the missionary Hugo Hahn travelled 15 hours through uninhabited, forested areas on his way from the territory of the Ndonga people to the territory of the Kwanyama people. Since the travelling speed with ox-wagons was 4 km per hour, the forested zone between the Ndonga in the south and the Kwanyama in the north can be estimated to have been about 60 km (Hahn 1867, p. 291). In the beginning of the 20th century the width of the forested belt between the two communities was perhaps 40 km (Siiskonen 1990), and in the 1950s about 10 km (Erkkilä and Siiskonen 1992). According to recent inventories, 4.5 % of the Omusati Region (north of the Etosha National Park) is forested, but there are no forested areas in the Oshana Region (Selanniemi et al. 2000a, 2000b). In the beginning of 2001 the National Forest Inventory (NFI) was not yet completed in the eastern parts of the Owambo area, the Ohangwena and Oshikoto regions (Chakanga, pers. comm.).

More than 60 indigenous woody species occur on the savannas of the Owambo area (Clarke 1999, Craven 1999, Selanniemi et al. 2000a, 2000b). A large proportion of woody biomass, especially in the densely populated *oshana* delta, consists of indigenous trees that produce edible fruits, such as *Adansonia digitata* L., *Berchemia discolor* (Klotzsch) Hemsl., *Diospyros mespiliformis* (Hochst. ex A.DC.), *Ficus sycomorus* L., *Hyphaene petersiana* Klotzsch and *Sclerocarya birrea* (A.Rich.) Hochst. The aboveground woody biomass is, however, rather small and scattered. Recent forest inventories indicate a mean woody biomass of 0.6 tons ha⁻¹ (dbh ≥ 5 cm) in the Oshana Region and 2.2 tons ha⁻¹ in the Omusati Region (Selanniemi et al. 2000a, 2000b), assuming a basic density of 0.7 tons m⁻³ (ERL... 1985). Basic density is defined as oven-dry weight (ton) divided by green volume (m³).

A fenced trial in the Oniipa constituency of the Oshikoto Region gives a fairly good indication of the natural regeneration potential in degraded savannas. The trial was established in 1967 (Figure 26) next to the Oshigambo High School (17°47' S, 16°04' E) in order to study the impact of fertilisation on an overgrazed sandy site (Soini 1981). Previously the trial site had been heavily trampled by passing cattle, goats and donkeys and had no woody vegetation cover (Väisälä 1967, photo taken 1965, p. 12.). The trial was abandoned in the early 1970s, but over the years the livestock-proof fence was maintained. In 1993 (Figure 27) trees and shrubs in the fenced area, covering a rectangle of about 4.5 x 68.0 m, were enumerated by the author of the present study. The oven-dried, aboveground biomass was estimated to be 22 tons ha⁻¹, when volume equations produced by the National Forest Inventory Project (1997) were used and a basic density of 0.7 tons m⁻³ was assumed. The estimated annual increment during 26 years – the period of total protection – was 0.8 tons ha⁻¹.

The tree species in the woodlands include *Acacia erioloba* E.Meyer, *Baikiaea plurijuga* Harms, *Boscia albitrunca* (Burch.) Gilg & Benedict, *Burkea*

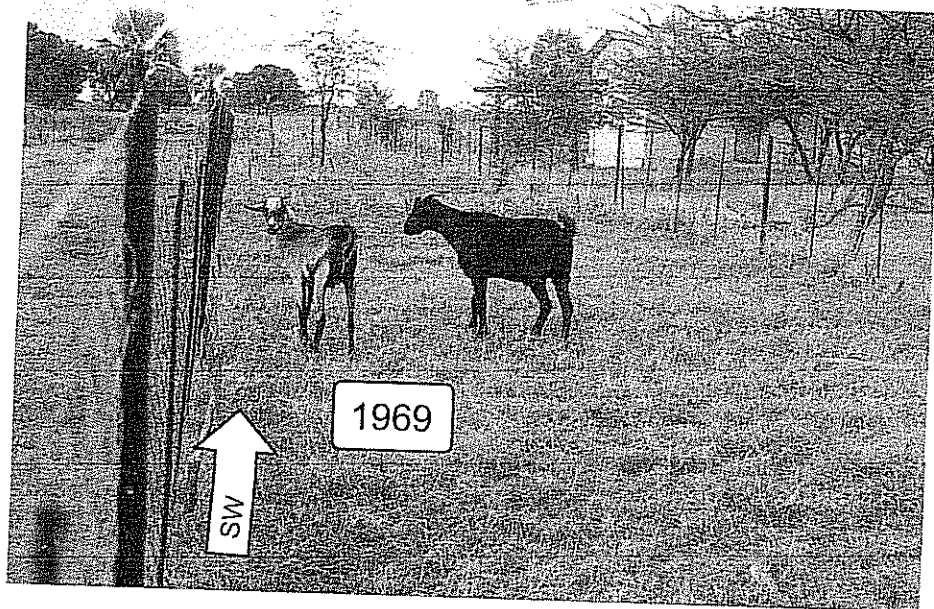


Figure 26. Newly fenced trial site in 1969 at the Oshigambo High School. The two goats were penned in temporarily and are not part of any scientific experiment. Photo: Sylvi Soini.

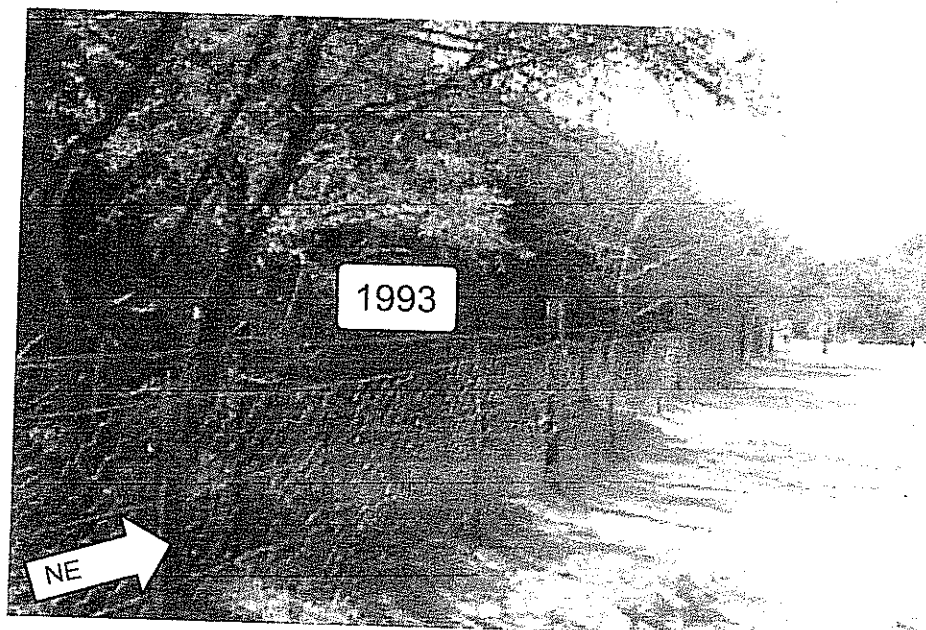


Figure 27. Fenced trial site on 3 June 1993 at the Oshigambo High School. The site is an example of natural regeneration potential in the degraded savannas. Photo: Antti Erkkilä.

africana, *Combretum* spp., *Erythrophleum africanum* (Welw. ex Benth.) Harms, *Guibourtia coleosperma* (Benth.) J.Léonard, *Lonchocarpus nelsii* (Schinz) Heering & Grimme, *Pterocarpus angolensis* DC., *Schinziophyton rautanenii* (Schinz) Radcl.-Sm., *Strychnos* spp., *Terminalia sericea* Burch. ex DC. and *Ziziphus mucronata* Willd., and the shrub species *Croton gratissimus* Burch., *Euclea* spp., *Grewia* spp. and *Ximenia* spp. The height of the dominant trees is usually 7–14 m, occasionally up to 16 m (Erkkilä, pers. obs.). The following species produce highly valued, edible fruits: *Euclea* spp., *G. coleosperma*, *Grewia* spp., *S. rautanenii*, *Strychnos* spp., *Ximenia* spp. and *Z. mucronata* (Rodin 1985).

Based on the forest inventory of 1973, in the present Eenhana constituency, assuming a basic density of 0.7 tons m^{-3} , the mean density of woody biomass can be estimated at 12 tons ha^{-1} (dbh $\geq 10 \text{ cm}$) on the northern sample plots and 26 tons ha^{-1} on the southern sample plots (Figure 28). In the areas further east, towards the Kavango Region, the density of woody biomass was even higher (Geldenhuys 1992). In the forest inventory of 1999, assessment of the Okongo Proposed Community Forest (55 918 ha) in the eastern Ohangwena Region next to the Kavango Region, indicates 30 tons ha^{-1} for living trees (dbh $\geq 5 \text{ cm}$) and 4 tons ha^{-1} for deadwood (Angombe et al. 2000c).

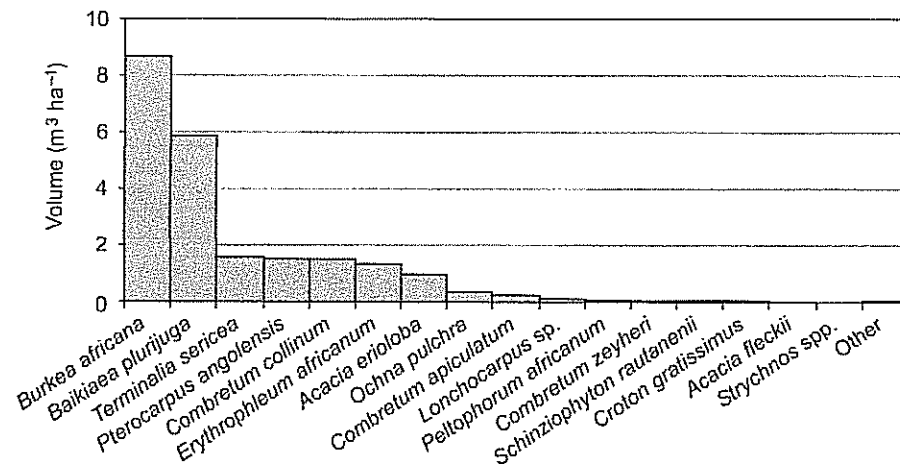


Figure 28. Mean volume of the growing stock (dbh $\geq 10 \text{ cm}$) by species in forested areas in the Eenhana constituency of the Ohangwena Region, based on the forest inventory of 1973. The data comprise 859 trees enumerated from 68 sample plots covering a total of 10.7 ha at 17 different sample points. Source of inventory data: CSIR (South Africa), see Geldenhuys (1992). Source of volume equations: National Forest Inventory Project (1997).