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SUSTAINABILITY OF BARK PRODUCTION FROM THE SOUTHERN CAPE FORESTS: POSSIBLE ALTERNATIVES

BY

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SUSTAINABILITY OF BARK PRODUCTION FROM THE SOUTHERN CAPE FORESTS: POSSIBLE ALTERNATIVES

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INTRODUCTION

The southern Cape forests form the largest forest complex in southern Africa, but are far removed from the areas traditionally settled by the black people. These forests have therefore hardly been utilised for traditional medicines when compared to the extent of such use of forests of the eastern Cape, Ciskei, Transkei and Natal.

The abandonment of influx control resulted in a large-scale redistribution of black people in South Africa. Increasing numbers settle in urban areas outside their traditional homelands, including Port Elizabeth to the east and Cape Town to the west of the southern Cape forests. Furthermore, they also settle around the towns and townships close to these forests, such as Plettenberg Bay, Knysna, Sedgefield, George and Mossel Bay. In this area bark harvesting from several tree species have been observed along easily accessible roads through the forest and near road camps. One can also expect that the southern Cape forests may become a source of medicinal bark for the unlimited demand from the large number of blacks in Cape Town and Port Elizabeth far removed from forests of reasonable size.

People vary in their needs for forest products. The product may be timber of a particular species for firewood or furniture, or fern fronds for the florist market, or bark for traditional medicines. Sustained utilisation means that the harvest of a particular product is in balance with the carrying capacity of the site, the size of the resource and the ability of the plant to recover in response to the harvesting impact. If the demand exceeds the sustained supply of the product, then the particular resource may be destroyed. In this paper we briefly explore the potential for sustained bark production from the southern Cape forests.

SPECIES IN DEMAND

Table 1 lists the southern Cape forest tree species used ethnobotanically in Natal (Dr A B

Cunningham pers comm 1990) and indicate their importance in different forest types in the southern Cape (Geldenhuys 1989). Note that several of the species of high demand and commonly used commercially in Natal are species of rare or disjunct distribution in the southern Cape forests. The southern Cape mountain and escarp forests are generally inaccessible by road, whereas the national road and several other major and minor roads provide easy access to many of the plateau forests. However, a large part of the plateau forests are inaccessible, or are frequently patrolled by forestry personnel. Most of the species of high to reasonable demand occur at least scattered in the plateau forests and one can expect some degree of harvesting of these species.

BARK UTILISATION FROM HARVESTED TIMBER

During recent years several attempts were made to utilise bark from trees harvested in the single tree selection system practised in the southern Cape forests. In this system moist and medium-moist forest stands are enumerated and trees are harvested on the basis of growth rate and the proportional contribution of species and diameters to the composition of trees $\geq$30 cm diameter at breast height. Non-utilisable trees marked for removal from the growing stock are killed standing by ring-barking. Utilisable trees are topped, i.e. the crown branches are removed, before the trees are felled in order to minimise canopy gap size. The branches are cut into smaller pieces and scattered around on the forest floor. The logs are slipped from the forest interior by mules or horses or lifted by helicopter in order to minimise damage to the remaining trees and the forest floor. The logs are graded and sold on timber auctions and it is therefore important that the logs have a good appearance. For that reason the logs are sprayed with pesticides to prevent insect or fungal damage. The small supply in relation to the large demand result in high timber prices.

Three possibilities exist for utilising bark from the harvested trees. Firstly, most of the bark in demand come from utilisable timber species. Bark could be harvested from the auctioned logs, but only after the auction and through negotiation with the buyer. Poisoning of the logs should then be stopped. Table 2 indicates the approximate bark volumes available from auctioned logs. Secondly, bark could be harvested from branchwood left in the forest, but the volumes are small. For example, most branchwood of Ocotea bullata trees are utilised because of the timber value. Thirdly, bark could be harvested from the ring-barked trees, but most of those tree species are not favoured for their bark.

Table 1 The distribution and abundance of southern Cape forest tree species used ethnobotanically in Natal

Species	Use	Forest type		
		Mountain	Plateau	Escarp
Apodytes dimidiata	1 R		***	**
Canthium inerme	1 R		*	**
Cassine papillosa	1 Bk(SC)		*	*
Clausena anisata	1 R(Ls SC)			**
Cunonia capensis	2 R Ls	***	*	
Curtisia dentata	1 Bk(SC)	*	**	*
+Cussonia spicata	2 R			*
Ekebergia capensis	1 Bk(SC)		*	*
+Erythrina caffra	3 R Sd		*	
Euclea schimperi	3 R			**
E. undulata	2 R			*
+Faurea macnaughtonii	1 Bk		*	
Ficus sur	2 R Bk		*	*
+Hippobromus pauciflorus	2 R			*
Ilex mitis	1 Bk	*	*	
Maytenus acuminata	1 Bk	*	*	*
M. peduncularis	2 Bk		*	*
Nuxia floribunda	1 Bk	*	**	*
Ocotea bullata	1 Bk(SC)	***	*	
Olinia ventosa	(3 Bk SC)	*	*	*
Pittosporum viridiflorum	1 Bk(SC)			*
Podocarpus falcatus	2 Bk		*	*
+Prunus africana	1 Bk			*
Pterocelastrus rostratus	1 Bk	**		
P. tricuspidatus	1 Bk		***	**
Rapanea melanophloeos	1 Bk(SC)	*	**	**
Rhamnus prinoides	2 R		*	*
Rhus chirindensis	1 Bk			**
Scolopia mundii	1 Bk		*	**
Sideroxylon inerme	3 R Bk			*
+Strychnos decussata	3 R (Bk SC)			*
+Syzygium cordatum	2 R Bk			*
Tarchonanthus camphoratus	3 Ls			*
Zanthoxylum capense	2 R			*
Z. davyi	1 R Bk		*	*

Legend Use in Natal 1: common, sold commercially; 2: infrequent, rarely sold commercially; 3: uncommon, not sold; Underline = high demand. (SC) = use observed in southern Cape.
Product: Bk = bark; Ls = leaves/twigs; R = roots; Sd = seeds.
Abundance: *** abundant; ** common; * scattered.
Phytogeography: + species of rare/disjunct occurrence in southern Cape

Table 2 Bark volumes available from southern Cape timber depots

Species	Year	Bark volume m³ George-Knysna	Bark volume m³ Tsitsikamma	Bark volume m³ Total	Number of 50 kg bags
Ocotea bullata	1987	15,0	8,1	23,1	46,2
	1988	13,2	6,4	19,6	39,1
	1989	11,2	4,0	15,2	30,1
Olinia ventosa	1987	1,0	0,2	1,2	2,3
	1988	0,9	0,8	1,7	3,4
	1989	1,2	0,1	1,4	2,5
Pterocelastrus tricuspidatus	1987	1,2	0,1	1,2	2,4
	1988	0,7	0,4	1,1	2,2
	1989	0,6	0,7	1,3	2,5
Curtisia dentata	1987	0,9	0,1	1,1	2,1
	1988	0,3	0,3	0,6	1,1
	1989	0,3	0,5	0,9	2,9
Rapanea melanophloeos	1987	0,4	0,1	0,5	0,5
	1988	0,4	0,5	0,9	1,7
	1989	0,3	0,4	0,6	1,2
Apodytes dimidiata	1987	0,2	0,1	0,3	0,7
	1988	0,2	0,4	0,6	1,2
	1989	0,4	0,8	1,2	4,6
Other species	1987	0,4	0,4	0,9	1,5
	1988	0,6	0,6	1,2	2,5
	1989	4,2	0,4	4,6	9,2

In the southern Cape the bark of Ocotea bullata is in greatest supply, but that supply is small in relation to the large overall market demand. This should only be sold to selective, honest traditional healers in order not to raise expectations in the open market, and only sold by the buyers of the logs if the logs are not poisoned.

REACTION OF STANDING TREES TO BARK HARVESTING

A knowledge of the role of bark in tree physiology may contribute to a better method of bark

harvesting (Figure 1). In general, water and mineral nutrients taken up by the roots are transported in the timber vessels to the leaves. Carbohydrates, i.e. the products of photosynthesis, and hormones are transported from the leaves through the phloem of the inner bark for storage in the roots and stem. Removal of a complete ring of bark around the tree will cut off the supply of carbohydrates to the roots. The roots will die, and eventually the tree, because of lack of supply of water and nutrients to the leaves. However, trees differ in their rate of decline after ring-barking and in their rate of recovery by forming callus tissue around the debarked wound (Geldenhuys 1982). It may be useful to investigate the effects of harvesting bark in narrow, vertical strips in comparison to removal of bark in horisontal strips, in order to maintain the sap flow between the leaves and root, and to speed up the healing of the debarked area.

ALTERNATIVE APPROACHES TO BARK HARVESTING

A three-fold approach is required for a sustained utilisation of bark intraditional healing. Firstly, an understanding is needed of the relative importance of traditional, medicinal and commercial incentives for bark harvesting. Some of this knowledge is available from studies by Dr A B Cunningham (pers comm 1990). Secondly, bark harvesters should be educated on alternative methods of bark harvesting to prolong the longevity of the tree, and the importance of sustaining the bark resource. Thirdly, short, medium and long term plans should be developed to secure the viability of the resource. In the short term immediate steps should be taken to increase the patrolling of sensitive areas and to negotiate the assistance and understanding of the traditional healers. In the medium term some control may be exerted over the market, and some of the demand may be supplied by controlled harvesting of bark from less accessible and inaccessible areas such as the southern Cape. Bark harvesters could even be incorporated into the timber harvesting process for utilising bark from non-utilisable timber trees and from timber off-cuts and branches. This approach may however receive much opposition from forest managers because it may lead to increased illegal bark harvesting as a result of entrance to and knowledge of otherwise inaccessible areas. Long-term solutions could be found in the establishment of tree crops in woodlots of suitable species for the eventual harvesting of bark from those trees. These woodlots could be established in suitable sites in the rural areas as well as near concentrations of people. This latter approach needs immediate action because trees take a long time to grow. Another long term solution may come from finding substitutes for the use of the specific bark types.

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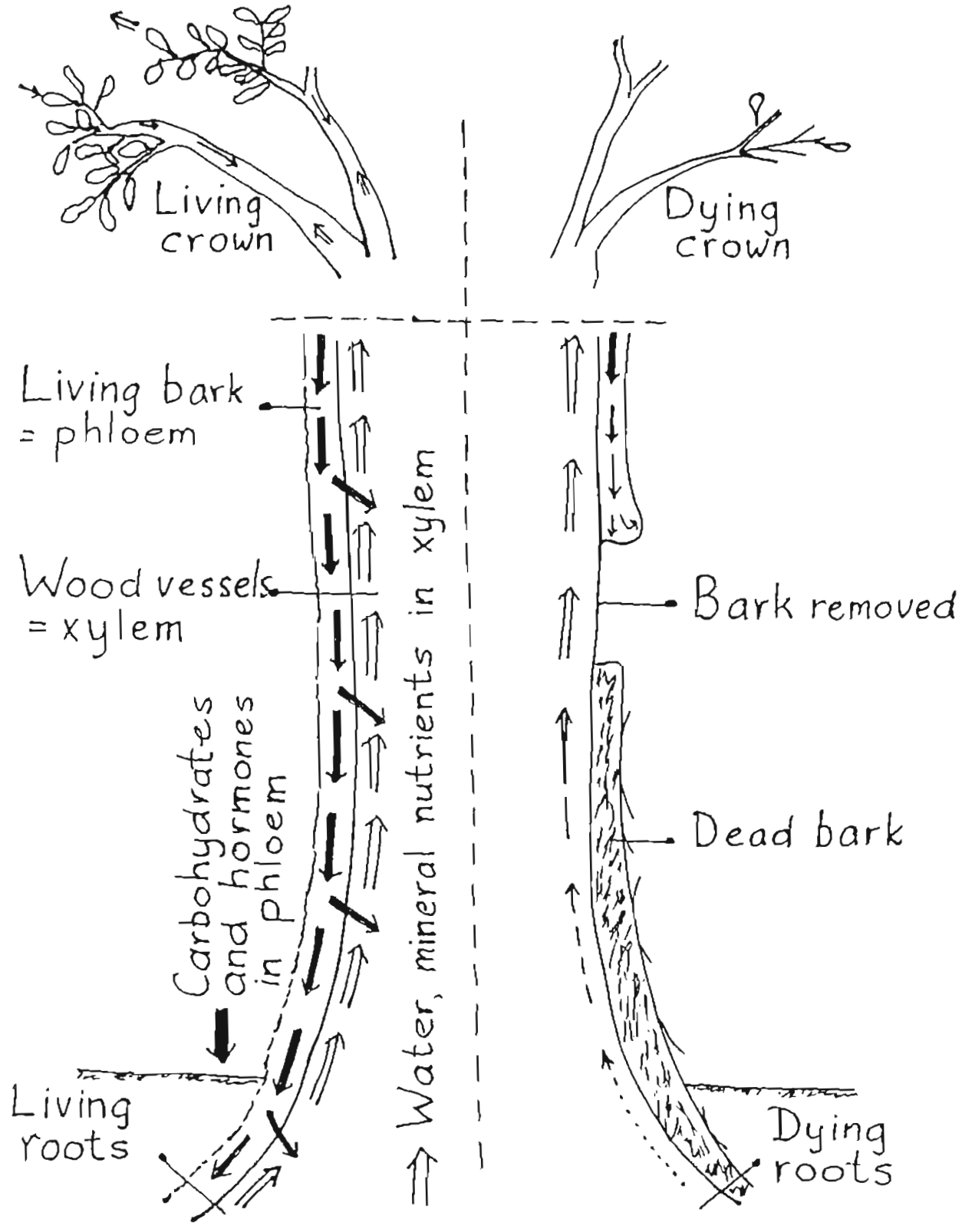

Figure 1 Physiological consequences of ringbarking