

COMMON PROPERTY OR FLEXIBLE RESOURCE USE MANAGEMENT:
ACCESS TO *FAIDHERBIA ALBIDA*
IN SOUTHERN ZAMBIA

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ABSTRACT

Diverse production is an intrinsic part of coping in fluctuating, arid and semi-arid environments. Farmers management of an integrated agricultural system is explored through field studies in southern Zambia.

The *Faidherbia albida* agri-silvopastoral production system has multiple uses, most important is soil amelioration and drainage assuring crop production and cattle fodder, especially important in the dry season and years of drought. Timber for canoes provide other options such as hunting, fishing, transport in general and for herders to reach remote pastures. There are numerous other uses such as human medicine, famine food, fuel, carpentry, crafts, fish poison and bee forage. The tree has reverse phenology, dormant in the cropping season and does not compete with crops for nutrients or light. Fall and flush is associated with start and end of rain season. Felling of mature *Faidherbia albida* is restricted.

Access to *Faidherbia albida* resources is complex, as is the "ownership" of the tree. A wide range of people often have access to *Faidherbia albida* resources and specific uses are authorized, or restricted, by the hereditary clan leader, depending on demand and availability and circumstances pertaining locally.

These access regulations ensure that the use of a valuable resource will not be detrimental to future exploitation. The site - specific inherent flexibility in time and space of management and access to rural resources provides a buffer against erratic ecological and socio-economic conditions.

COMMON PROPERTY OR FLEXIBLE RESOURCE USE MANAGEMENT: ACCESS TO
FAIDHERBIA ALBIDA IN SOUTHERN ZAMBIA

By Jonas (John) Olsen*

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INTRODUCTION

In this presentation I will focus on trees in fields in Africa, those trees that were protected when clearing the land for cultivation and naturally regenerated trees nurtured by people. It seems odd, at least for an outsider, that specific trees in cultivated and individually managed fields are CPR's.

In these arid areas making a living has always been risky. Over time people have adapted strategies that minimise risk and secure a livelihood. One of many such strategies is common control of access to critical resources.

The role of woody vegetation is crucial in rural livelihoods and the management of this often common property resource, is dynamic and diverse and many details still remain to be researched and analysed in their full complexity (Messerschmidt 1993). Bruce (1990) states that different tenure systems have evolved to meet specific needs of particular people.

Based on field research in southern Zambia I will seek to explain the context in which CPR's, in this case trees in fields, are managed and how and why rural peoples' knowledge is essential for maintaining and rejuvenating this resource.

The role of trees and forests

In arid environments with erratic, unreliable rainfall, woody vegetation provides a stable element, drawing on ground water, nutrients and minerals from a huge soil profile down to 40 meters depth, utilising 20-30 meters of the space above ground for photosynthesis. Trees are not adversely affected by annual fluctuations; on the contrary fruiting may be more prolific in years of drought (Wilson 1989). Crop land and pasture with integrated trees is clearly far more productive than a mono crop would be and advantageous to a wide range of people.

Woody vegetation and species associated with it often provide critical resources such as food, fodder, fuel and raw materials for household reproduction and for cash income. Woody vegetation often produce when little food and fodder is available, or fruit and leaves can be dried and stored. Medicine which is often derived from trees and forests are crucial for rural people.

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Policy interventions commonly used in many African states, including economic incentives, direct control, market facilities and promotion of "modernity", have transformed agricultural systems (Olsen 1992) and many farmers have removed trees from fields in order to grow cash crops using hybrid seeds and fertilizers. This was also the case in Zambia and Zimbabwe, where the practice of integrating trees in fields were severely damaged by the colonial legacy. Agricultural extension, until recently, recommended that all trees be cleared from fields before cultivation of crops, (Campbell et al 1991). Credit was only given on condition that all trees were cleared from fields.

Despite discouraging policies, integrating annual crops, livestock, trees and shrubs on one plot of land is an ancient practice and still common in African farming systems where outside influence has not been too influential.

Many economically important trees are kept in fields, on field boundaries or around homesteads, (Sørensen 1993a)

Table 1 Some common trees kept in fields and their uses

As seen in this table trees are mainly kept for shade, fodder, to attract manure, surface mulch, human food, canoes, medicine and fibre.

In the following the focus will be on one species namely *Faidherbia albida* former *Acacia albida*, dominant in extensive managed stands of farmed parkland (Pullan 1974) in southern Zambia. *F. albida* is a deep rooted leguminous tree, with reverse phenology, it has prolific pod production which is a valuable cattle fodder; sustaining twice as many cattle on the same land area; improves soil fertility so fertilizers is not used; timber from mature trees is utilized for producing dug-out canoes which contribute fish and game to the livelihood system. There are numerous other uses such as human medicine, famine food, crafts, bee forage etc.¹ The *Faidherbia albida* farming system is an example of a practiced sustainable production system.

Map 1 *Faidherbia albida* rangewide distribution

The distribution of *Faidherbia albida* is associated with human activity. *F albida* rarely occurs in natural woodland but is found on fallowed, cultivated or grazing land.

In West Africa *F albida* and other economic species are also protected in places. In the past there was death penalty for felling *F albida* both in Niger (Baumer 1983) and in Zambia.

1 Other uses of *Faidherbia albida*: seeds were used as famine food after eliminating poisonous hydro-cyanic acid (Scudder 1971); human medicine (Wickens 1980); fencing using live trees as well as cut branches; fuel which is the best of the acacias; timber is used for light carpentry and crafts, and in order to avoid insect damage wood is soaked for several months which will eliminate all traces of sap (Baumer 1983); wood ash is used for soap and depilatory; pods as fish poison; and flowers are sought by honey bees (Booth & Wickens 1988).

Figure 1. Diagrammatic cross section of the Kafue Flats showing relief, vegetation, soils, human population and activity.

Brief description of local economy

The people are the Tonga, Ila and Twa, who have lived in this area for more than a thousand years (Fagan 1966; Clarke 1980). Livelihoods are derived from a diverse local production. The dominant activity, but not the only one, within the Tonga, Ila and Twa groups are crop cultivation using ox draught, livestock (Fielder 1979) and fishing respectively. There is a considerable interdependence and exchange between the different livelihood systems and ethnic groups. Production is largely commercialized and is seen as one of the most productive areas in southern Africa in terms of maize, cattle (Kwesiga & Kamau 1989), fish and wildlife. Supplementary economic activities are hunting, fishing, crafts and utilization of trees and forests, for sale and for consumption.²

Recent shifts in agricultural policy towards market economy, including removal of subsidies on fertilizers, hybrid seeds and marketing facilities, may encourage farmers to re-establish trees in fields, as farmers are open to alternatives that will restore fertility and viable production. Farmers, in specific areas already maintain, protect and regenerate trees in the landscape. *F albida* and other species are present as weeds and as mature trees. The know how of restoring the system is inherent knowledge of the people in the area..

FARMERS CRITERIA FOR MANAGING *FAIDHERBIA ALBIDA*

Management priorities vary from place to place depending on what farmers see as most important at the time.

Regeneration

Livestock feed on the protein rich seed pods and the indigestible seed contained in cattle manure when excreted undamaged after 5 to 6 days, has favourable conditions for germination. *F albida* is an invasive pioneer species, spreading from the riverine habitat to the red laterite soils in the Miombo woodland environment as seed are brought in by cattle when feeding on crop residue in harvested fields.

F albida cannot be eradicated as it grows vigorously from the root when it is cut. The invasive character of the species leave farmers with little choice but to manage it one way or the other. Trees with genetically desired characteristics such as straight boles and fast growth are carefully selected and pruned. Later trees with poor fruiting are felled in thinning.

² Crops cultivated are: maize, millet, groundnuts, sweet potatoes, beans, pumpkins for consumption and sale; vegetable gardens are grown in the dry season. Cattle provide: draught animals, milk, meat, breeding animals; other livestock are goats, pigs and poultry. Fishing, hunting and harvesting from trees and forests contribute to the economy.

Fertility

The main reasons given by farmers for managing *F. albida* are to increase soil fertility, water holding capacity and drainage. Farmers perceive the system as a buffer against environmental fluctuations. Some farmers manage *F. albida* for fodder and shade merely to attract livestock to manure their fields.

In the cropping season the leafless canopy shades the crops slightly, acts as a windbreak and intercepts heavy rain. Mineral elements leached to deeper soil layers are taken up by the deep root system and the small leaves are ploughed in just before planting. When preparing the field for cultivation, the juvenile *F. albida* regrowth is cut and burned annually, functioning as a short swidden-fallow contributing nutrient rich ashes to the soil.

Fodder

The prolific seed pod production, dropped approximately 3 to 5 months after flowering, serve as a protein rich feed for livestock, enabling optimal use of roughage such as maize stover (LeHouérou 1980), as only the maize cob is harvested. Towards the end of the dry season, when fodder is in short supply *F. albida* pods keep livestock in good condition and draught animals fit and ready for ploughing when the rain sets in. In southern Zambia, the community's cattle may graze on crop residues and *F. albida* pods in any field, according to agreements made between farmers. Pods have no commercial value.

Canoes

In the vicinity of the Kafue Flats an important use for *F. albida* timber is in the making of dug-out canoes. Canoes are used by fishermen who fish the Kafue river and lagoons, as well as by farmers for transport when herding cattle or hunting on the flood plain. This has a significant impact on the management of *F. albida*, which in some areas are specifically grown for this purpose.

Tree tenure consists of variable property rights (Fortmann 1985; Bruce 1989; Shepherd 1990), and rights to utilise *F. albida* vary with location, user, and intended use. Canoe makers take orders from fishermen and request suitable trees for canoes from village headmen. Permission is required from the local clan leader, as is approval by the farmer and the headman. The labour involved in making the canoe gives the canoe maker the right to the tree free of charge. If the farmer utilizes trees from his own land for his own use no permission or payment is required. If a tree is used in the Namwala area a licence from the Forestry Department is required.

When trees are selected for a canoe, trees are only allocated where there are other trees to take its place and usually only trees with low fruit production are given. If a tree is at a holy grove, *Malende*, the home for ancestral spirits, permission for felling can not be obtained.

As can be seen from this account, even within a narrow geographical area, there is variability in farmers management criteria and practice as well as access regulations.

Figure 2 Economic interaction of *Faidherbia albida*

Tenure and institutional implications:

It has often been said that people will not plant or manage trees on farm land unless they own the resource. This research shows, that people with no title deeds to the land and with no ownership to the trees are growing trees on farm land.

What seems to be the determining factor is that people are secure in their tenure and that the distribution of benefits from resources is seen to be fair.

Why are these resources common property ?

The great variety of resources that are needed in rural households is facilitated through flexible and negotiable access regimes. The resources are spread over extensive areas or confined to specific habitats and are needed at different times of the year and in different ecological and social conditions.

The important task of allocation and sustaining the resource is the responsibility of the hereditary clan leader who is chosen from a pool of contenders of maternal kin. These clan leaders are referred to as "The Owners of the Land" and one of their tasks are to manage natural resources on behalf of their clan.

In rural resource use people have access and make use of indigenous knowledge held by a wide range of people and the knowledge is available to those who are interested.

The diverse use of this resource is evident; access to the resource and the knowledge about how to manage it is important for sustaining a livelihood for rural people.

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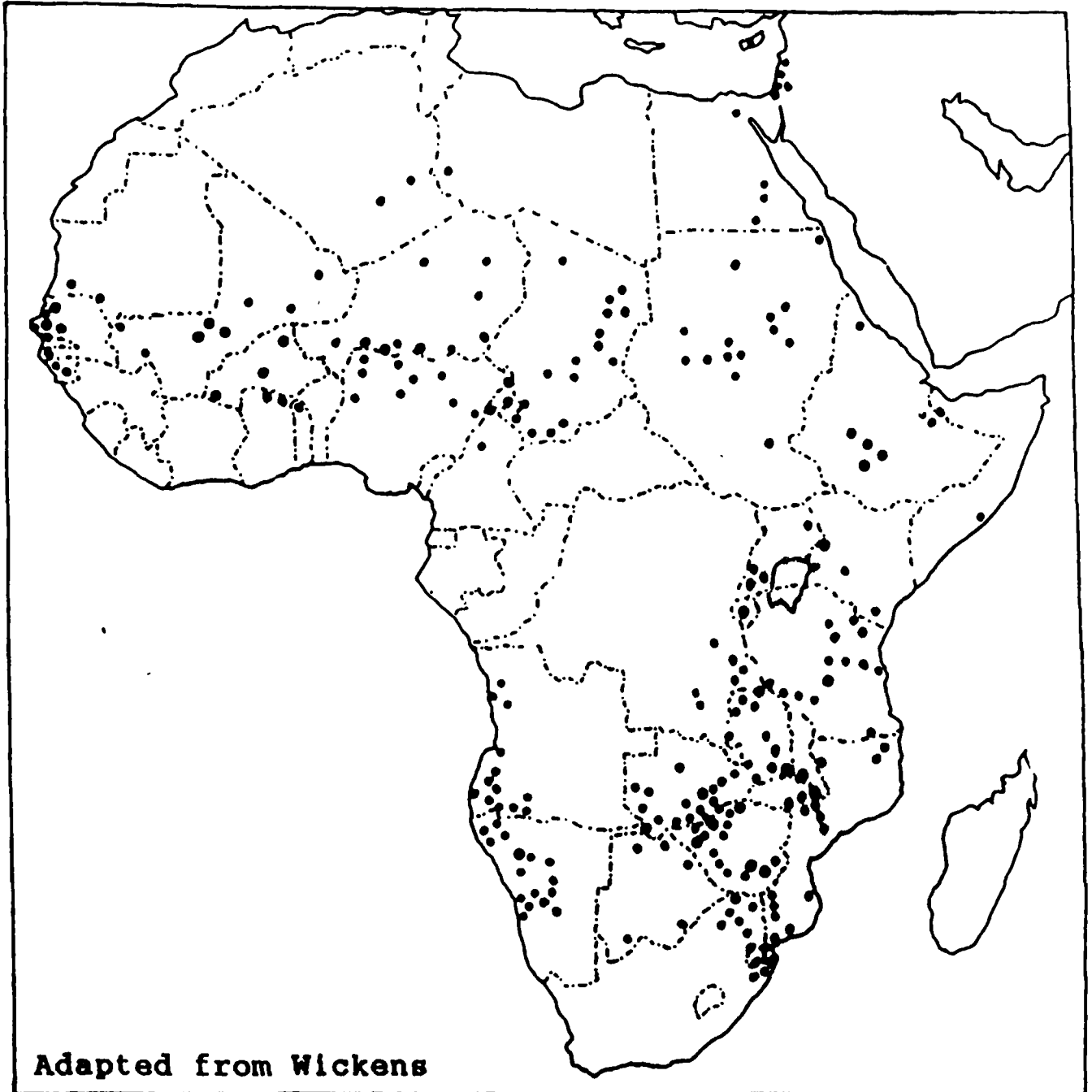
Table 1 SOME COMMON TREES KEPT IN FIELDS AND THEIR USES

USEFUL FOR PROVISION OF:	MUNGA <i>F. albida</i>	MUKUYU <i>Ficus</i> species	MUBUYU <i>Adansonia</i> <i>digitata</i>	MUSUNGUNA <i>Kigelia</i> <i>africana</i>	MUBOLA <i>Parinari</i> <i>curatelifolia</i>
Shade	X	X	X	X	X
Fodder	X	X	X	X	X
Attract manure	X	X	X	X	X
Surface mulch	X	X			
Human food		X	X		X
Canoes	X	X		X	
Medicine	X	X	X	X	X
Fibres	X		X		
DISADVANTAGES					
Hard to kill	X				
Shades crops		X		X	X

(Sørensen 1993)

MAP 1.

DISTRIBUTION OF FAIDHERBIA ALBIDA ON THE AFRICAN CONTINENT

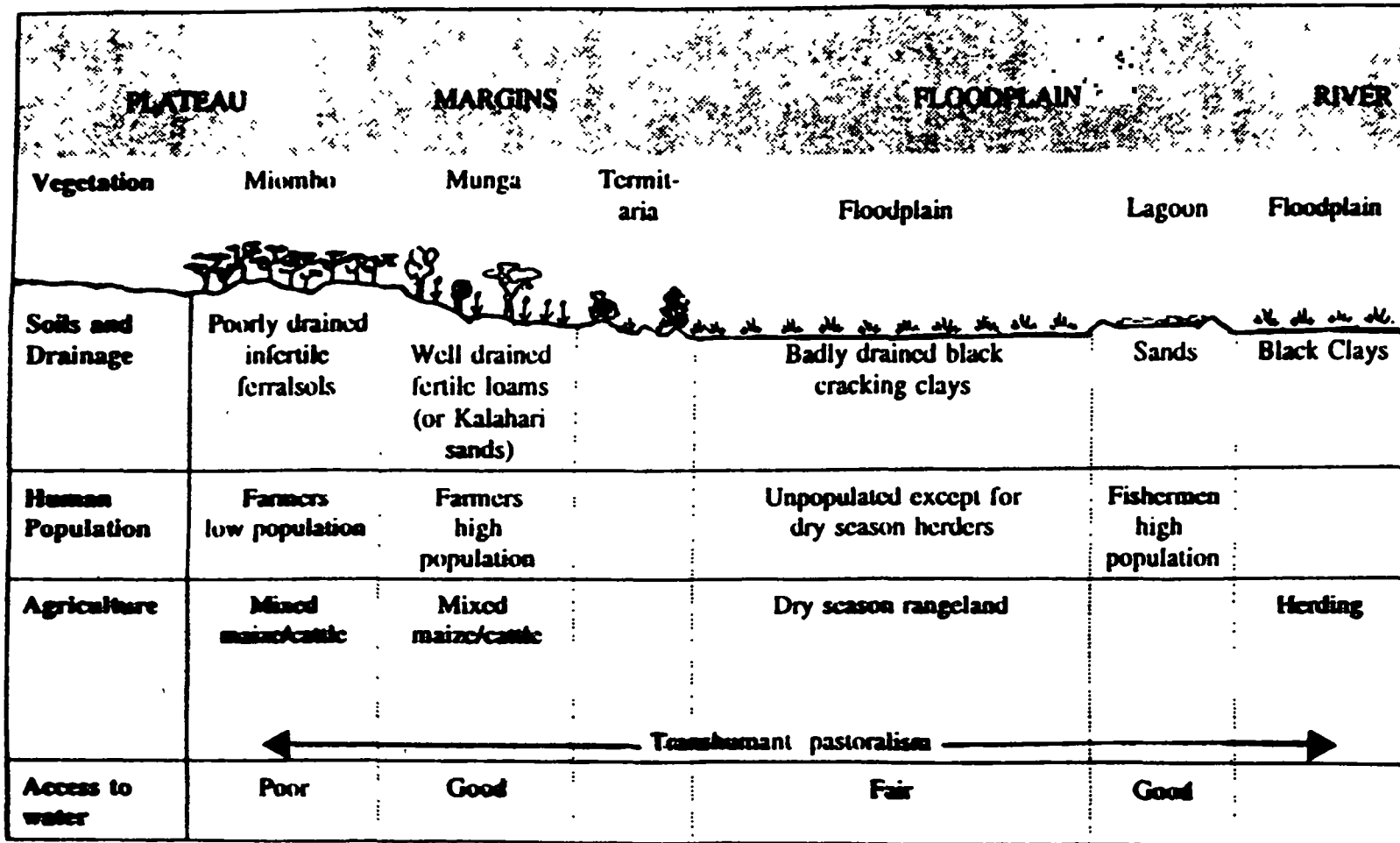


Adapted from Wickens

Figure 1

DIAGRAMMATIC CROSS SECTION OF THE KAFUE FLATS AND THEIR MARGINS

showing relief, vegetation, soils, human population and economic activity



SOURCE: Carol Sorensen

Figure 2 The Economic Interaction of F. albidus

