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# DIVERSIFYING COMMUNAL RANGELAND USE AND BENEFITS: THE CASE OF MARULA (*SCLEROCARYA BIRREA*) IN BUSHBUCKRIDGE, SOUTH AFRICA

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## INTRODUCTION

Treed landscapes characterise most of the rangelands of eastern and southern Africa. In South Africa about 70 % of the entire area of communal rangeland falls within the savanna biome. Some 76 % of the rural population resides within these communal lands and is dependent on the rangelands not just for livestock production, but also for the wide range of goods and services these systems deliver, including wood for fuel, materials for construction and tools, wild foods, medicines and craft materials. Indeed, evidence is emerging that these natural resource products often contribute as much to household income and well-being as livestock, and form part of the overall livelihood portfolio of considerably more households than own livestock (Shackleton, Shackleton & Cousins 2001). The multi-purpose, fruit-producing marula tree (*Sclerocarya birrea*), so characteristic of the semi-arid deciduous savannas of sub-Saharan Africa, is a key resource within the region. Found primarily in the communal rangelands, but also nurtured within fields and homesteads, this species has long held a special place in the livelihoods and culture of rural communities within its distribution range. In this paper, we examine the contribution of this resource to household food security, livelihood diversification and income in the Bushbuckridge district of Limpopo Province, South Africa. We then consider issues relating to the management of this resource and the communal rangelands as a whole. We draw on data gathered from 142 households in four villages in the district, as well as three separate studies on commercial markets for marula, governance and management, and the resource base.

## CONTRIBUTION OF MARULA TO LOCAL LIVELIHOODS

Marula fruit and other products from this species are extensively used by a majority of households in the study area, making *S. birrea* one of the most significant wild resources in the district (Table 1). Over 90 % of households harvest the fruit, which is either eaten fresh or brewed into a hugely popular and culturally significant alcoholic beverage (a cider-like beer) known locally as *vukanyi*. The hard nut that remains after the flesh is removed contains 3-4 oil, protein and micronutrient rich kernels that are consumed by a similar proportion of households as a dietary supplement. The extracted kernels may be eaten whole as a snack, or added to other dishes, in particular wild spinaches, usually after grinding into a paste. In some regions, e.g. north-central Namibia, the kernels are pressed to produce an oil used mainly in cooking, but also for cosmetic purposes. Other important uses and products from marula include jam, wood for fuel, fencing and carving, bark for medicine, and fodder (Table 1). Marula branches are often cut as forage for goats and cattle, particularly in times of drought, and over-ripe fruits and discarded skins are said to be much enjoyed by pigs and goats alike. Some interviewees mentioned that the leaves of this tree also have veterinary properties. The edible emperor moth caterpillar found in marula trees in abundance early on in the season forms a source of food for about half of households. The high use of marula for fuelwood (94 % of households) is potentially problematic as it could compete with other uses, although most households indicated that they harvest only dry wood (or did not admit to using green wood which is prohibited). There were numerous complaints amongst the people interviewed that whole trees were being felled for firewood, and this was becoming a matter of concern especially given the growing commercial value of this resource. The expanding softwood curio industry along the southern border of Bushbuckridge could also result in a conflict of interests in the future. In 1998, approximately 33 cubic metres of marula wood was used in this

industry for carving a range of animal figurines ranging in size from less than one metre to over three metres in height (Conrad Steenkamp, unpublished data).

Table 1: Proportion of households in four villages in Bushbuckridge making use of a range of marula products, and by way of comparison, owning cattle, goats and pigs.

| <b>% of households using:</b>  |   | <b>Allandale</b> | <b>Edinburgh</b> | <b>Hokwe</b> | <b>Rolle</b> | <b>All</b> |
|--|---|------------------|------------------|--------------|--------------|------------|
| Fruit  | Eating                                  | 94.3             | 94.4             | 94.4         | 94.4         | 94.4       |
|  | Beer                                    | 77.1             | 71.4             | 75.0         | 77.8         | 75.4       |
|  | Juice                                   | 28.6             | 5.7              | 8.8          | 8.3          | 12.9       |
|  | Jam                                     | 60.0             | 30.6             | 16.7         | 16.7         | 31.0       |
|  | Other (fodder, sell, manure)            | 0                | 30.6             | 16.7         | 16.7         | 16.1       |
| Kernels  | Whole                                   | 91.4             | 80.6             | 91.7         | 88.9         | 88.1       |
|  | Oil (cooking)                           | 2.9              | 0                | 0            | 0            | 0.7        |
|  | Oil (cosmetic)                          | 5.7              | 0                | 0            | 0            | 1.4        |
|  | Add to food                             | 74.3             | 44.4             | 63.9         | 61.0         | 60.8       |
|  | Other (sell, burn)                      | 11.4             | 19.4             | 11.4         | 16.7         | 14.8       |
| Wood   | Carving                                 | 5.7              | 2.8              | 2.8          | 8.3          | 4.9        |
|  | Utensils                                | 11.4             | 2.8              | 5.6          | 19.4         | 9.8        |
|  | Firewood                                | 94.1             | 94.4             | 94.4         | 91.7         | 93.7       |
|  | Other (cattle yoke, fencing, furniture) | 2.9              | 8.3              | 8.3          | 8.3          | 7.0        |
| Medicine   | Bark                                    | 35.3             | 44.4             | 41.7         | 33.3         | 38.7       |
|  | Roots                                   | 2.9              | 11.1             | 11.1         | 5.6          | 7.8        |
|  | Leaves                                  | 2.9              | 2.8              | 2.8          | 5.6          | 3.5        |
| Caterpillars   |   | 47.1             | 51.4             | 63.9         | 52.8         | 53.9       |
| Larvae   |   | 2.9              | 2.8              | 0            | 2.8          | 2.1        |
| Games  |   | 42.9             | 55.6             | 80.6         | 61.1         | 60.1       |
| Other (e.g. burn shells, veterinary use, leaf skirts, fodder, rattles and necklaces, fencing, diviners dice) |   | 25.7             | 22.2             | 33.3         | 19.4         | 15.1       |
| <b>% of households owning:</b>   |   |                  |                  |              |              |            |
| Cattle   |   | 25.7             | 25.0             | 33.3         | 22.9         | 26.7       |
| Goats  |   | 20.0             | 25.0             | 25.0         | 22.9         | 23.2       |
| Pigs   |   | 11.4             | 16.7             | 2.8          | 11.4         | 10.6       |

The quantities of marula fruit consumed are considerable. Households collect, on average, over one tonne ( $1207 \pm 122$  kg) of fruit per season (usually from January to March) (Table 2), with the highest amount recorded being 7140 kg and the least 9 kg. This is within the same range as results obtained from two linked study sites in South Africa and Namibia (Sheona Shackleton *et al.*, unpublished data). Most women collect about 15 times per month or four times per week, although some go out daily. The average quantity of fruit collected per trip is just over half an 80 kg maize meal sack or  $47 \pm 2$  kg. The most important source of fruit is the communal rangelands with over 89 % of households collecting primarily from these areas, often waking-up as early as 3:00 am to obtain the prime fruit. About three quarters of households make beer, brewing on average between  $139 \pm 34$  l and  $311 \pm 97$  l across the four villages (Table 2). Like fruit collection, there is considerable variation in the volumes brewed amongst households, from as little as 10 l to a maximum of 3670 l. This beer is nearly always shared with neighbours and friends at gatherings hosted by the producer households. These events are important in renewing and cementing social networks, bonds and reciprocal relations and in building important urban-rural linkages, as urban relatives inevitably come home to join in the festivities. Even households that do not consume beer themselves brew it for the social 'insurance' it provides. Marula thus has a key role to play in maintaining and building social 'capital'. Marula kernels have been part of the diet of people in the district for generations, although today have been partly substituted by groundnuts. On average households produce and

consume about 10 l of kernels per year (Table 2). Jam is a relatively new product and was not traditionally made. Households making jam are producing about 4 – 7 l per year (Table 2), with a few selling this jam for supplementary cash.

Table 2: Average quantities of the most popular marula products consumed by households in Bushbuckridge (Mean  $\pm$  SE)

| Amount of product used/produced per household per season | Allandale      | Edinburgh      | Hokwe          | Rolle          | All            |
|--|----------------|----------------|----------------|----------------|----------------|
| Kg of <u>fruit</u> collected                             |                |                |                |                |                |
| -across all households                                   | 1229 $\pm$ 281 | 1285 $\pm$ 246 | 1408 $\pm$ 260 | 942 $\pm$ 183  | 1207 $\pm$ 122 |
| -across user households                                  | 1393 $\pm$ 307 | 1413 $\pm$ 259 | 1551 $\pm$ 271 | 1030 $\pm$ 196 | 1325 $\pm$ 131 |
| Litres of <u>beer</u> produced                           |                |                |                |                |                |
| -across all households                                   | 168 $\pm$ 48   | 246 $\pm$ 105  | 311 $\pm$ 97   | 139 $\pm$ 34   | 227 $\pm$ 42   |
| -across producer households                              | 235 $\pm$ 63   | 370 $\pm$ 153  | 400 $\pm$ 120  | 200 $\pm$ 44   | 312 $\pm$ 56   |
| Litres of <u>kernels</u> extracted                       |                |                |                |                |                |
| - across producer households                             | 13 $\pm$ 4     | 7 $\pm$ 1      | 6 $\pm$ 1      | 12 $\pm$ 2     | 10 $\pm$ 1     |
| Litres of <u>jam</u> produced                            |                |                |                |                |                |
| - across producer households                             | 8 $\pm$ 3      | 3 $\pm$ 1      | 2 $\pm$ 0.8    | 10 $\pm$ 5     | 5 $\pm$ 2      |

Increasingly marula products, particularly the beer, are being traded in local markets in nearby towns, forming an important source of seasonal income for as many as 200-300 households. Beer traders, over half of whom are single mothers and heads of their households, are earning, on average, a net income of R500 (US\$50) per season, with a few earning over R2000 (US\$200). This is a substantial cash injection at a critical time in the rural household's calendar - the period after Christmas and the start of the new school year. The potential of this species has also not gone unnoticed by entrepreneurs seeking new commercial opportunities or development agencies concerned with improving the welfare of rural dwellers. Communities in Bushbuckridge supply fruit to two important marula-based commercial enterprises: Distell, a private company and the producer of the well-known Amarula Cream liqueur, and the Mine Workers Development Agency's (MDA) marula project, a DFID funded project aimed at employment creation. Both create income-earning opportunities for local residents. Incomes earned from fruit sales range on average from R194 to R580 (US\$19 - 58) per household per season (approximately three months), although income varied considerably in relation to the amounts sold (from R9 – R1016). Kernels are also sold to the MDA marula project for processing into oil for export. This helps to extend the otherwise restricted trading season. Women selling kernels are earning on average R120 – R325 (US\$12 – 32) per year across the four villages. Although incomes are modest, the timing is important. Most earnings are used for paying school fees and purchasing uniforms, books and stationery, whilst a few very poor households use the cash mainly to buy food. Overall the two marula enterprises are believed to have injected approximately R1.1 million (US\$110 thousand) into the local economy, and provide a source of income for as many as 2000 trading households. The return to labour for this activity is twice that for the average farm labourer. The total direct use value of marula fruit (excludes conversion into higher value products) to households in the district is estimated to be approximately R18 million (US\$180 thousand) (calculated by multiplying the number of households in the district by the average direct-use value of fruit consumption per household). This is 23 % of the estimated value of livestock in Bushbuckridge (obtained from Shackleton *et al.* 2002) – a significant sum considering that marula is but one of a range of non-timber forest products (NTFPs) found in the communal rangelands.

## THE MARULA RESOURCE BASE

Marula is a dominant tree in terms of biomass and canopy cover in most areas where it occurs. As such it is an important component of the rangeland landscape, providing shade and fodder for a number of browsers, as well as a shady and more fertile subcanopy habitat supporting some of the more palatable grass species that are favoured by grazers. A comparative study of the resource in communal lands and protected areas showed that the density of trees is greatest in protected areas, and is least in intensively modified sites such as fields and homesteads. However, the density of adult female (fruit bearing) trees is comparable between these two (4 - 5 trees ha<sup>-1</sup>). Recruitment is constrained in human impacted environments, possibly a reflection of the effects of livestock and anthropogenic disturbance, although these same environments may offer shelter, for example within fences, for young seedlings. The density of trees increases with increasing distance from villages. However, almost 80 % of households maintain marula trees around their homesteads confirming the importance of this species in the overall landscape and livelihood mosaic. There is some indication that such plantings are selective, with homestead trees being larger than communal land trees, and they also bear more (50 - 400 % more) and larger fruit (20 %), even when factoring out the effects of tree size. This, plus analysis of the variation in fruit characteristics indicates that some degree of selection and domestication has already occurred by inhabitants of the region.

## **GOVERNANCE AND MANAGEMENT OF MARULA**

Since most marula in Bushbuckridge occurs in the communal rangelands it is a resource that is readily accessible to the majority of residents of the area. There certainly appear to be few restrictions on who may collect fruit, although some villagers mentioned that the permission of the local headman is required before outsiders can collect within a village's communal land boundaries. This response was more frequent in Edinburgh, the village with the highest percentage of households participating in commercial trade, indicating that commercialisation may influence the way in which people perceive and modify the property rights to a particular resource as its value changes. In terms of felling marula trees, the customary (and often also government) regulation that pertains to all fruit trees, i.e. that these should not be cut, also applies to marula. However, there appears to be very poor enforcement of this rule in Bushbuckridge and many people were concerned that the harvesting of marula wood for fuel and carving would have a negative impact on the resource base in the future. In this respect, there is no real functioning management system in place for this important species. This is thought to be, in part, a consequence of increases in population, poverty and unemployment and thus pressure on the resource base particularly for energy requirements; increased trading in fuelwood; and a breakdown in respect for the traditional leadership and its authority. Other confounding factors include the fact that these areas form part of the former 'homelands' to which people were removed during apartheid, and remain sites registered in the name of the state to which communities have user rights only rather than secure tenure. This, combined with an administrative and political vacuum in the area, has resulted in marula becoming effectively an open access resource. These same concerns and issues apply to other rangeland resources. Degradation of the tree resource will inevitably result in degradation of the grazing resource if key ecological services are lost. However, on the positive side, many of the people interviewed felt that a renewed awareness of the cultural and domestic significance of marula brought about by the commercialisation process, as well as the monetary value of the traded products will restore people's interest in managing this resource more sustainably. This would be particularly the case if the industry continues to grow, hand-in-hand with education, awareness raising and support for the management of communal resources.

## **WHAT DOES THIS MEAN FOR RURAL LIVELIHOODS AND THE MANAGEMENT OF THESE RANGELANDS?**

The results reported here indicate that many so-called "rangelands" have multiple uses and values. Seldom are these alternative uses given adequate attention when addressing rural development, agrarian reform, livestock production and rangeland management issues. Development interventions to improve rural livelihoods and the management of rangelands tend to be species and/or sector specific and focused on particular user groups, usually livestock owners or farmers. However, any system for the sustainable management of this communal resource needs to take cognisance of all users and uses, and the interaction and synergies between these (Shackleton, Shackleton & Cousins 2000). In terms of the savanna rangelands of southern Africa, we believe that a much more holistic approach that mirrors how these areas are actually used and how people's livelihoods are constructed is required, both to enhance livelihoods and promote natural resource management. Agriculturalists and foresters need to work more closely to seek integrated solutions, including the incorporation of natural resource management strategies into local and regional-level planning. Currently, competing management objectives within the rangelands and uneven investment of government and donor support amongst different use sectors undermines the successful optimisation of diverse land-use options. However, we believe that the growing value of alternative products, such as marula, for rural livelihoods might well be the needed catalyst to trigger this change. The potential to use a valued resource such as marula as an entry point to a broader communal land management strategy appears encouraging and such opportunities need to be built on.

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