



## Collection of urban tree products by households in poorer residential areas of three South African towns



Humphrey Kaoma, Charlie M. Shackleton\*

Department of Environmental Science, Rhodes University, Grahamstown 6140, South Africa

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### ABSTRACT

The high rates of urban in-migration and poverty common in many developing country towns potentially increases the reliance of urban populations on the direct benefits provided by trees. Yet understanding of the extent of such use and the sources of these tree products is limited. Here we report on the extent of use of urban tree products by 450 households in the poorer areas of three towns along a rainfall gradient based on household questionnaires. We considered the proportion of households making use of each of several tree products and the collection or purchasing frequency which we disaggregated by source of the product, including trees in homesteads, urban spaces, edges of towns and via purchase from traders. Most households (91%) used firewood, which was most frequently collected from the urban fringe or purchased, although one-third at times also collected firewood from trees on their home plot. All households used fruits, most commonly sourced through purchase (98%), but nearly half of whom also supplemented by harvesting fruits from their home plot. Other products used included wood for building, fencing and utensils, herbal medicines, planting material and mulch. Collection of products from urban homestead trees was highest amongst households in the informal settlements and least in the more established townships. Residents of new low-cost housing areas made extensive use of urban tree products harvested in urban spaces because they had fewer homestead trees than residents of informal areas or townships. Overall, urban residents made use of a wide array of tangible products from trees which they sourced from a variety of places, including their homestead plot. This urges that planning agencies ensure that homestead plot sizes or other urban spaces that provide tree products are large enough to support the direct needs of poorer urban residents.

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### Introduction

The goods and services provided by trees for human wellbeing are well known and are increasingly being quantified (Dobbs et al., 2011; Soares et al., 2011). For example, trees provide timber for energy, construction, utensils and carving; fruits, seeds and leaves for food; fronds, bark and roots for fibre; resins, bark and roots for medicines and flowers and seed pods for decoration. Environmentally, trees help reduce stormwater runoff and hence soil erosion, they provide windbreaks for agricultural crops and residential areas, they sequester carbon and ameliorate the urban heat island effect and poor air quality, and they also provide habitat and food for other organisms. Non-consumptive benefits provided by trees include shade, inspiration, psychological rejuvenation, a sense of place, and for some they contribute to cultural identity. Taken

together, these multiple benefits have the potential to improve human wellbeing, enhance local environmental sustainability and reduce poverty (MEA, 2005; Shackleton, 2006).

Although trees provide both consumptive and non-consumptive benefits, these different benefits have not received equal attention within research and policy arenas. International literature and understandings of urban forestry are largely founded on work in developed countries, particularly North America and Europe (Shackleton, 2012; Wendel et al., 2012). Most urban households in these regions make little use of consumptive products from trees in their local environment and hence research has focussed on non-consumptive and ecological benefits, with some exceptions such as McLain et al. (2012) and Poe et al. (2013). In contrast, it can be observed that poorer urban communities in developing countries make use of tree products from their local environment (Long and Nair, 1999). For example, Davenport et al. (2011) showed that up to 70% of poorer urban households in three small towns in South Africa regularly collected at least one tree product (mostly firewood, herbal medicines and fodder for livestock) for direct use.

\* Corresponding author. Tel.: +27 46 603 7001.

E-mail address: [c.shackleton@ru.ac.za](mailto:c.shackleton@ru.ac.za) (C.M. Shackleton).

However, there is limited research regarding the extent of such use by urban communities in the developing world, who is most involved, the contribution the products make to household well-being, how it differs within and between towns and how it impacts the urban forests. Such knowledge is necessary to understand the livelihoods and factors that contribute to the wellbeing of the urban poor, who are likely to make most use of consumptive tree products from their immediate environment.

Consumptive tree products can bring direct income into the household through trade (Kalaba et al., 2009; Murwendo, 2011) and indirectly by cash saving through the supply of free products (Murwendo, 2011). They may also be useful as a temporary safety-net in the event of a household suffering a setback, such as retrenchment, illness or death (Shackleton and Shackleton, 2004; Zulu and Richardson, 2013). It may also be that the most recent migrants to urban areas make use of tree products as a carryover of their former rural livelihood practices or culture (Stoian, 2005; Shackleton, 2012). Thus, there is a need for attention to the consumptive uses of tree products in urban settings of the developing world, the contextual factors that hinder or enhance such use, the significance of such use in local livelihoods and consequently the types of urban forestry policies and programmes needed in such contexts.

The extensive markets for tree products in urban areas attest to the consumer demand that they enjoy. For instance, in many cities of the developing world, firewood or charcoal are the main household energy source (Arnold et al., 2006; Malimbwi et al., 2010). Brouwer and Falcão (2004) reported that 74% of urban households in the capital city of Mozambique (Maputo) used charcoal, and whilst use was more prevalent amongst poorer households, it was not restricted to the poor. In small towns of the Eastern Cape Shackleton et al. (2007) found that 65% of households used firewood as a primary energy source. These fuels can be transported over large distances to provide urban consumers with energy (e.g. Shively et al., 2010), but some of this firewood is harvested within or on the peripheries of towns (Openshaw, 2010; Davenport et al., 2011). Similarly, wild fruits are widely sold in urban markets. For example, Termote et al. (2012) describe the trade in wild fruits and other edible species by dozens of traders in Kisangani (DRC). Traditional medicines from tree products are perhaps transported the furthest to meet urban consumer demand, with Williams et al. (2000) and Botha et al. (2004) revealing supply chains transporting over hundreds of kilometres, even crossing international boundaries, to the largest urban centres in southern Africa. These sectoral studies amply demonstrate that urban households make extensive use of tree products. However, there are few studies that have looked at all tree products simultaneously, using the household as the unit of analysis, rather than the product, and little work as examined the source of the tree products used by urban households.

The potential sources of tree goods for these markets and urban use are varied. For high value resources, or those with significant demand, they may be transported into urban areas over long distances from rural regions where there is greater resource supply. Additionally, some tree products may be harvested from within and at the fringes of urban areas (Fuwape and Onyekwelu, 2011). Given the lower volumes of tree products available from these places because of their small spatial extent, harvesting is likely to be largely for household use rather than for sale on local markets. Vacant patches and the edges of towns are particularly vibrant areas for harvesting of tree products because of the rapid rate of land transformation (Nkambwe and Sekhwela, 2006; Murwendo, 2011). These zones may also be the temporary home to new, poor migrants to the town who reside in informal structures until they can secure a better livelihood in the urban economy. Lastly, tree products can also be harvested by residents from their own homesteads. Although the magnitude of supply of tree products from

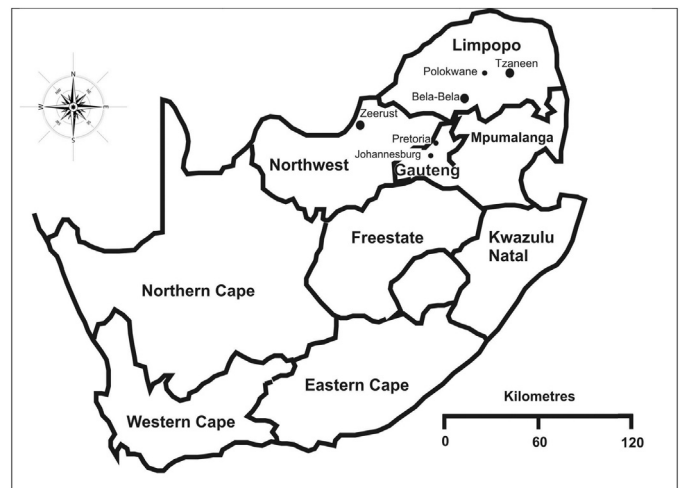


Fig. 1. The three study towns (Tzaneen, Bela Bela and Zeerust) in South Africa.

individual homesteads it likely to be constrained by the small size of homestead plots, the aggregate volumes across entire suburbs or towns could potentially be large. However, the harvesting of tree products from these private spaces has been hardly examined internationally.

As elsewhere in the world, towns in South Africa can be readily separated into different zones. Residential zones are typically differentiated on the basis of socio-economics, with the relatively affluent suburbs enjoying large plot sizes with substantial gardens (Lubbe et al., 2010). The relatively poorer suburbs house higher densities of residents on smaller plots (McConnachie and Shackleton, 2010). In most towns of the region, these poorer residential areas can be further differentiated into two zones, and in South Africa, into three. In South Africa, up until the early 1990s, poorer African residents were restricted by apartheid government policies to living in racially segregated areas called townships. Since that time the national government initiated a massive low-cost housing scheme as part of the post-apartheid Reconstruction and Development Programme. Hence, these new low cost areas are called RDP areas or RDP houses. They are reserved for the indigent. The third area that can be discerned in most South African towns is one dominated by informal housing (Hunter and Posel, 2012). Typically these are occupied by new migrants to a town who are waiting to be allocated an RDP house. In the meantime, they settle on vacant land on the edges of towns or apparently unused lands within the town and construct houses from cheap or scavenged materials. In large and long-established informal areas some local municipalities may provide some services (such as piped water, refuse removal, street lights and electricity).

Within the context of the above, this study sought to establish the extent of use and sources of tree products consumed by households in the poorer suburbs of three small South African towns. We hypothesised that use would be least amongst the more established and wealthier (relatively) households of the townships than those in the more transient informal areas and amongst the poorer households of the RDP suburbs.

### Study areas

The study was conducted in three small South African towns in the Limpopo and North West provinces (Fig. 1), which span a precipitation gradient of relatively high to low rainfall. Tzaneen receives approximately 850–900 mm p.a., Bela Bela, 650 mm p.a. and Zeerust 550 mm p.a. (Mucina and Rutherford, 2006). Census data on population sizes of specific towns are imprecise because the

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