



The direct-use value of urban tree non-timber forest products to household income in poorer suburbs in South African towns



Humphrey Kaoma, Charlie M. Shackleton *

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

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ABSTRACT

Valuation of the contribution of non-timber forest products (NTFPs) to household incomes has been well researched in the rural and remote areas of the developing world. In comparison, there has been little investigation of the contribution of NTFPs in urban areas and amongst the urban poor. This paper reports results from a survey of 450 households across three towns on the use and value of tree NTFPs collected by households in the poorer areas from their own homesteads, open spaces within towns and at the urban periphery. Collection (and purchase) of tree NTFPs was widespread, especially of firewood and fruits. The ratio collected from homesteads relative to other urban spaces differed between products and the amount required. Overall, approximately 20% of household income was derived from urban tree NTFPs. The highest contribution (33%) was amongst the poorest sectors represented by mostly recent migrants to towns who were living in informal settlements whilst trying to establish a foothold in the urban economy. In the formal housing areas the contribution was at least 14%, which has been overlooked by standard income surveys in urban areas.

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1. Introduction

The contribution of non-timber forest products (NTFPs) to the income basket of rural households has been the focus of much research over the last two decades (Angelsen et al., 2014; Shackleton et al., 2011). Cash and non-cash incomes from NTFPs range up to 60% of total household income (Angelsen et al., 2014; L'Roe and Naughton-Treves, 2014), with the differences between studies being a consequence of the local context, the availability and viability of alternative income sources, consumptive as opposed to trade income and precisely what resources are included (or excluded) under the NTFP banner. Moreover, there are now numerous empirical studies showing that the proportional income from NTFPs is typically markedly higher for the poorest households within a community (Kar and Jacobson, 2012; Paumgarten and Shackleton, 2009; Rueff et al., 2009), although there are local exceptions (e.g. Ambrose-Oji, 2003). Wealthier households may earn higher incomes from NTFPs (e.g. Fu et al., 2009), but proportionally it is usually less than that of poorer households (Heubach et al., 2011), unless derived through trade. Wealthier households are also more likely to specialise in the NTFPs they use and with greater emphasis on cash incomes and trade from NTFPs (Belcher et al., 2005; Fu et al., 2009).

Because of the usually higher proportional contribution of NTFPs to the incomes of poorer households there has been some debate whether

or not NTFP use represents a poverty trap or a pathway for poverty alleviation (Bhattacharya and Innes, 2012; Shackleton et al., 2007b; Wunder, 2001). Some authors are sceptical of the potential for NTFP use to underpin widespread poverty alleviation (Angelsen and Wunder, 2003; Wunder, 2001). This has been countered by arguments that any single strategy alone is rarely sufficient to lift significant numbers of rural people in the developing world out of poverty, and NTFPs are a viable strategy for some households within particular contexts, especially so where the agro-ecological potential of the area is low (Shackleton et al., 2007b, 2008). Moreover, very few national or sub-national governments have invested as much in the NTFP sector as they have in agriculture, forestry and ecotourism (via subsidies, extension support or marketing assistance), and thus the bases for comparative analyses are not equivalent (Shackleton and Pandey, 2014).

The aforementioned debates have been restricted to the use and potential of NTFPs in rural settings because (i) levels of poverty are typically highest in rural areas (e.g. Shackleton et al., 2007b), (ii) the availability of NTFPs is likely to be greatest in rural areas (Schlesinger et al., 2015), and (iii) the use of NTFPs as a catalyst for forest conservation is only possible where there are reasonably intact landscapes and vegetation. However, with increasing urbanisation, the nexus of poverty is inexorably shifting towards urban settings (Ravallion et al., 2007), and so debates about NTFPs and poverty need to consider urban locations. Additionally, NTFPs are available in and around urban areas in both the developed (Kilchling et al., 2009; Grabbatin et al., 2011; McLain et al., 2014) and developing world (Malimbwi et al., 2010; Kaoma and Shackleton, 2014), although little considered in the NTFP

* Corresponding author.

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

debates (Poe et al., 2013). Lastly, up until recently there has been only limited acknowledgment to the potential for conservation goals to be met in urban settings, but this is changing (Miller and Hobbs, 2002), especially as urban greening becomes more mainstreamed and urban peripheries expand outwards, ever closer to conserved areas (McDonald et al., 2008). This will thus require future interrogation of the role of NTFPs in urban settings and livelihoods and how land use changes shape NTFP availability, access and use (Grabatin et al., 2011; Hurley et al., 2015).

Most previous work on NTFP use in urban settings has been in relation to market chain analysis of NTFPs harvested in rural areas and then transported to urban markets for urban consumers; for example, firewood (McCrary et al., 2005), wild fruits (Termote et al., 2012), medicinal plants (Jusu and Sanchez, 2013), carvings (Standa-Gunda et al., 2007) and the like. This focus on market chains of NTFPs imported from rural areas has overlooked the possible consumptive use of non-marketed NTFPs by urban households from spaces within towns and cities (McLain et al., 2014), trade in NTFPs harvested within urban areas (Grabatin et al., 2011), or cultural use of urban sourced NTFPs (Grabatin et al., 2011; Hurley et al., 2015). Trees and tree products are cardinal in improving the livelihoods of people in both urban and rural settings. Trees provide both consumptive and non-consumptive products, which are widely recognised and appreciated (Horst, 2006; Roy et al., 2012). Common amongst the consumptive tree products are typical NTFPs such as fruits, firewood, herbal medicines and wood for building, fencing, and household tools (MEA, 2005). Others are seeds and seed pods for decoration, compost and mulch. Trees also sequester and store carbon, provide habitats for associated biodiversity, reduce water runoff and soil erosion and provide shade and inspiration (Fuwappe and Onyekwelu, 2011; Roy et al., 2012), which represent non-consumptive tree products. Even though trees and tree products contribute to livelihoods and the environment, the consumptive use value of tree products in urban areas is largely unknown. There are very few studies which have attempted to impute the value of tree NTFPs in urban areas (Davenport et al., 2012; Malimbwi et al., 2010), and consequently, such use has not entered the debates around the value and contribution of NTFPs to urban household incomes and ecosystem services, and the magnitude of their importance, especially for the urban poor.

Within this context, we sought to determine the gross consumptive value of tree products sourced within urban settings as NTFPs to urban households. This included tree products collected from homestead plots and those harvested from urban spaces and the peripheries of towns. We also consider the purchase of tree NTFPs by urban households as an indicator of demand. Non-timber forest products in this context were taken as all biological products harvested from urban trees for consumption or small-scale trade. We had three hypotheses: (1) the presence of widespread markets for NTFPs in urban areas indicates significant demand and therefore we expected there would be high levels of tree NTFP collection within urban areas, (2) collection and consumptive use of tree NTFPs would be greatest in the poorest areas because of smaller incomes from other activities, and (3) that use and contribution to household income would be inverse to climatic suitability for agriculture because aridity would undermine the contribution of urban agriculture as a livelihood strategy.

2. Study areas

This study was conducted in three small South African towns in the savanna biome of the Limpopo and North West provinces (Fig. 1). The three towns 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 national census enumeration boundaries do not correspond with town boundaries but extend beyond and include rural populations

and villages some distance away. Best estimates for the three study towns are that each has a population of approximately 25,000–35,000, and each also serves as a commercial centre for large rural populations relatively close by. Socio-demographic statistics therefore refer to the whole municipality, rather than the towns specifically.

The formal economic base of each town is weak, largely dependent on government services, agriculture and ecotourism. Unemployment rates for working age adults range from 31% in Bela Bela (Bela Bela Local Municipality IDP, 2010) to approximately 60% in Tzaneen and Zeerust (Greater Tzaneen Local Municipality IDP, 2011; Ngaka Modiri Molema District Municipality IDP, 2011). Consequently, poverty levels are high. In Tzaneen about 29% of households report no cash income sources and in Bela Bela and Zeerust almost half the population lives below the poverty line (Stats SA, 2008). Formal skills are varied, but illiteracy levels are high, with up to 40% of adults having no or only rudimentary education (Stats SA, 2008).

Each town is spatially differentiated into different suburbs largely along socio-economic lines, but due to South Africa's recent racially discriminatory past, there are also racial overlays in suburb composition (Wilkinson, 1998). The poorer areas of most South African towns are almost exclusively home to black African households (Steyn, 2012). Three such areas are readily identified (Shackleton et al., 2014). The township areas were zoned for black South Africans during the apartheid period and thus are relatively older than the other two. The RDP areas were built post-1994 as the newly elected democratic government sought to address a massive housing backlog. RDP stands for the 'Reconstruction and Development Programme' during which millions of low-cost houses were built in high density suburbs. They are reserved for occupation by the indigent, with lists of qualifying households maintained by local municipalities. Lastly, many towns also have areas where new migrants to towns have erected informal, semi-permanent structures of cheap or collected materials on urban peripheries or vacant land within towns as they seek employment opportunities and formal housing in urban areas. Whilst some residents in informal areas may live there for many years or decades, tenure security can be precarious. In the townships, household tenure is private, whilst in the RDP areas it is usufruct for a defined period (typically 5 years) after which ownership is supposed to be transferred from the state to the occupier. Collection of NTFPs elsewhere in towns may be from municipal land (state) or undeveloped private lands if access is not controlled. Although all three areas are regarded as the poorer sectors of urban society in South Africa, on average, township residents are better off than RDP residents, who in turn, on average, are slightly wealthier than residents of informal areas. Plot sizes are variable, but generally less than 1000 m² in RDP suburbs, but almost double that in townships and informal areas (Kaoma and Shackleton, 2014).

3. Methods

3.1. Household surveys

Aerial photographs (scale 1: 5000) were used to identify the township, RDP and informal settlement areas in each town. Within these three residential areas, each house was numbered and then 50 households were randomly selected at which we undertook an inventory of all trees (indigenous and exotic) (Kaoma and Shackleton, 2014) and conducted a structured interview with closed and open-ended questions.

The household interview considered the use of and trade in tree NTFPs and the sources of those products (this included firewood, wood for housing and fencing, wood for household utensil or handles, fruits, medicinal bark and roots, flowers and seeds, mulch and compost). A household was regarded as a group of people usually sharing the same dwelling and meals more often than not. The household head was interviewed if present, but where absent, any adult member of the family was interviewed. The interviewees were encouraged to

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