



The prevalence of planning and management frameworks for trees and green spaces in urban areas of South Africa



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ABSTRACT

Optimisation of the benefits from urban forestry and greening to urban dwellers and the environment rests on proactive and appropriate management planning, implementation and resourcing. Yet, lessons from the developed world show marked variability in development and adoption of urban tree and green space (UTGS) strategic plans and systematic monitoring and maintenance. Although financial and human resources for UTGS may be constrained in developing world contexts, there is no knowledge of the extent to which local authorities engage in appropriate and timely planning, management and monitoring. Here we examine the UTGS resourcing, planning, maintenance and integration across 28 local municipalities in the two poorest provinces in South Africa. It was revealed that most local municipalities were not managing their UTGS in a planned or systematic manner due to constraining factors such as insufficient funds, insufficient personnel, lack of equipment and lack of political support. Only 7% of the surveyed municipalities had an urban tree management plan and an estimate of the urban tree stock; 32% had tree policies; 21% had tree planting schedules; 11% had tree maintenance schedules. Over 65% claimed to engage other stakeholders in tree planting, but much was passive receipt of trees for planting rather than citizen engagement around species, places and values. Generally, the prevalence of most planning and maintenance elements increased with increasing size of the municipality and the presence of personnel specifically for UTGS management. It is likely that the prevalence of planning and maintenance functions will increase with greater political support from municipal councillors which may also decrease funding challenges.

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1. Introduction

Trees and green spaces in and around urban areas provide a wide array of economic, social, physical, psychological and environmental benefits (Pedlowski et al., 2002; Nowak and Dwyer, 2007; Landry and Chakraborty, 2009). Consequently, the role and contribution of trees and green spaces to urban sustainability and liveability is increasingly recognised across a range of policy, planning and management disciplines and spheres. This recognition is more pronounced in countries of the developed world, but developing countries too, despite an array of unique challenges and resource constraints (Shackleton, 2012), are gradually embracing the importance of urban trees and green spaces (UTGS).

To realise the potential benefits that UTGS offer, urban authorities need to develop strategic management plans to identify and deliver the benefits most desired by local residents in different

areas of the city and the wider urban context and periphery. UTGS need to be well managed to offer optimal ecosystem service flows and benefits to local people and the environment (Johnston and Rushton, 1998; Dwyer et al., 2003; Britt and Johnston, 2008). Strategic and proactive management improves the likelihood of attaining stated goals and is usually more cost-effective than ad hoc or reactive management (Johnston and Rushton, 1998), and certainly reduces the likelihood of damages from hazardous trees (Britt and Johnston, 2008). Having well developed and coordinated plans also enhances the ability of UTGS officials to motivate and compete for financial and human resources (Booth, 2005). Within the urban forestry field, various contributors have identified core elements of UTGS planning and management as (i) resourcing, (ii) proactive inventory and planning, (iii) systematic scheduling of monitoring and management activities and (iv) integration across scales with interested parties and stakeholders (Miller, 1997; Johnston and Rushton, 1998; Randrup, 2000; Konijnendijk et al., 2005; Britt and Johnston, 2008). Integration of these core planning elements allows for optimal management of UTGS from initial establishment through to death or removal (Urban, 2008).

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Although the need for strategic planning and management of UTGS is well appreciated, the prevalence and adoption of such planning appears variable. For example, [Stevenson et al. \(2008\)](#) found that 27% of the surveyed municipalities in Pennsylvania (USA) had urban tree management plans, whereas [Treiman and Gartner \(2004\)](#) reported that only 10% of Missouri (USA) communities had such. The proportion of local authorities that had developed and implemented systematic UTGS monitoring and maintenance programmes was even more variable, ranging from a few percent in Canada ([Conway and Urbani, 2007](#)) to 60% in Sweden ([Saretok, 2006](#)) and 75% in Germany ([Gerhardt, 2010](#)). Interestingly, these examples pertain to developed countries, typically characterised by greater human and financial resources and higher involvement of the general public in environmental issues than is found in most developing countries. There is a relative dearth of information and analysis of the policy and management situation for UTGS activities from the developing world.

South Africa is an intriguing country because it has both developing and developed country characteristics. Due to decades of legislatively enforced racial segregation and underdevelopment in areas designated for 'black' South Africans, there is a stark juxtaposition of relatively rich, developed areas against very poor and underdeveloped ones. At the national level environmental and forestry policies and legislation are well articulated in planning processes, but their recognition, adoption and implementation at local level is variable ([Shackleton et al., 2014](#); [Gwedla and Shackleton, 2015](#); [Ruwanza and Shackleton, 2015](#)). Previous work in South Africa does not differentiate whether this variability is a consequence of differences in resourcing of UTGS or of differences in planning and implementation, although there is evidence from a single province in South Africa that larger and better resourced municipalities have higher coverage by UTGS ([McConnachie et al., 2008](#); [Gwedla and Shackleton, 2015](#)).

Within the context of the above, this paper reports on a study to investigate the planning, management and resourcing dimensions of UTGS in South Africa. With respect to planning and management we disaggregated it according to the four elements mentioned above, namely resources, proactive planning, systematic management, and integration with other stakeholders. Specifically we sought to answer the following key questions: (i) what is the extent to which local municipalities have adopted planned, systematic and integrated management of UTGS, and (ii) what do UTGS officials perceive as the major challenges to fulfilling their mandate.

2. Study areas

South Africa has three tiers of government below the national level. The country is divided into nine provinces, each of which has a premier and elected officials. Each province is then subdivided into between two and ten district municipalities (44 in total), and where there are large cities or agglomerations, metropolitan municipalities (eight in total). In turn, each district municipality serves to coordinate across three to eight local municipalities (approx. 263 in total), each of which represent the lowest tier of government and are represented by elected councillors and a mayor.

Two of South Africa's nine provinces were selected for direct study, namely Limpopo Province and Eastern Cape. They were chosen on the basis of their similar socioeconomic status (being the two poorest provinces in South Africa) but differing in their macrobiophysical environment, with Limpopo Province being largely within the savanna biome, whilst the Eastern Cape is dominated by grasslands in the east and a mix of thicket, fynbos and karoo shrublands in the west ([Mucina and Rutherford, 2006](#)). The contrasting macro-environmental conditions and vegetation of these two provinces (but with similar socioeconomic characteristics and

national policies) allowed us to hypothesise that municipalities in the Eastern Cape, which is dominated by biomes with few trees, would have more efforts in promoting tree planting and regulating tree use to compensate for the relative lack of naturally treed areas in the surrounding landscapes. An alternative hypothesis would be that the lower abundance of naturally treed areas in the Eastern Cape results in less social expectation or pressure to provide trees in urban areas.

3. Methods

3.1. Data collection

During the first quarter of 2012 three district municipalities were randomly selected from each of the two provinces ([Fig. 1](#)). Thereafter, three local municipalities per district municipality were also randomly selected ([Table 1](#)). If officials of any of the selected local municipalities were uninterested or unavailable at the time of data collection, the next randomly selected municipality on the sample frame was approached. A total of nine local municipalities (out of 25) were covered in the Limpopo Province, with corresponding figures for the Eastern Cape being eight local and two metropolitan municipalities (out of 39).

Within each randomly selected municipality, face-to-face, structured interviews were conducted with key informants, such as park managers, horticulturists, environmental officers, town planners and any municipal officials responsible for planning and management of UTGS. The interview comprised both closed and open-ended questions in six sections, namely: General information about the municipality and the respondent; Resources for UTGS; Planned management of UTGS; Systematic management of UTGS; Support and integrated management of UTGS, and Challenges to UTGS planning and management. Management elements derived from similar studies conducted in other parts of the world ([Miller, 1997](#); [Saretok, 2006](#); [Britt and Johnston, 2008](#); [Gerhardt, 2010](#)) were used to characterise UTGS management in the surveyed municipalities ([Table 2](#)). These included the presence of: a budget for tree related activities; personnel specifically responsible for trees; tree inventory records or knowledge of the urban tree stock; a tree or greening strategy; a tree planting schedule; a tree maintenance and inspection schedule; an urban tree management plan; urban tree by-laws; and municipal procedures protecting UTGS during development activities.

A broader perspective was sought by sending a covering letter introducing the study and the link to an online questionnaire to all local municipalities in the country (263) in mid-2012. Email contacts for the municipalities were obtained from the Government Communication and Information Systems (GCSI) department website. Of the 263, 98 were returned due to invalid addresses. After sending two reminders to the valid addresses (three and six weeks after the initial one), only nine municipalities completed the online questionnaire (Eastern Cape – 2; Gauteng – 2 (both were metros); KwaZulu Natal – 1; Mpumalanga – 1; Western Cape – 3). In total, the study involved 28 municipalities, out of which 19 were face-to-face surveys and nine were online surveys. Of the 28, four were metropolitan and 24 were local municipalities. Additionally, the website of each of the 28 municipalities was accessed and by-laws pertaining to UTGS were noted and summarised. Of the total 28 municipalities sampled, 10 had a population of less than 100,000 people, eight had more than 300,000 people and 10 were intermediate between these two sizes, roughly corresponding to small, medium and large municipalities respectively. Consequently our random sample slightly overestimated large municipalities relative to the other two (across both provinces 40.6% of municipalities have less than 100,000 people; 43.8% have 100,000–300,000 people and 15.6% have greater than 300,000 people).

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