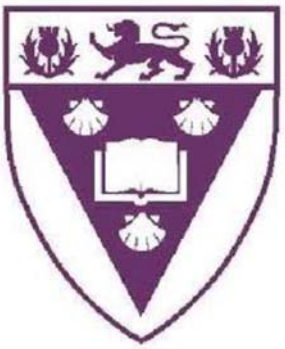
How do urban dwellers identify with features within urban green spaces in the Eastern Cape?



A thesis submitted in fulfilment of the requirements for the degree of

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ABSTRACT

Public urban green spaces contain natural and artificial features which play crucial roles in supporting urban social-ecological systems, a fact now recognized globally. The various natural and artificial features contained in public urban green spaces are said to be key contributors to the quality of life and well-being of urban dwellers. Nevertheless, this has been largely ignored in urban design in South Africa, especially in the poorer township and Reconstruction Development Program (RDP) areas. At the individual household and community levels within the poorer communities, the provision of green spaces and trees, as well as recreation facilities, is well below world standards, and much less than what is available in the more affluent areas of South African towns. Additionally, most research on the links between nature and human well-being in urban contexts comes from developed world contexts which adopt a westernized view of the relationship. Yet, in many societies of the Global South, including South Africa, worldviews and experiences of nature in green spaces and use of other recreational features takes on different meanings to those of the Global North.

To show these differences, a combination of methods was used in this study, different types of green spaces were assessed and evaluated by structured observations so as to record the features present within the spaces. A survey of 360 households was conducted by targeting green space users and households within 100 metres from a green space. Results indicated that, across all the green space types, formal green spaces had a low cover of shrubs, trees and herbs whilst having high lawn cover. Furthermore, vegetation had poor rating across all the green spaces since the vegetation was either overgrown herbs, dense thickets of shrubs and mostly alien trees that were either diseased or forked. Similar to the disparity in the composition and structure of vegetation within the green spaces, there was a wide variability in the composition of recreational features and amenities across the green spaces. The formal green spaces had the most amenities like play equipment, shelter and seating. Informal green spaces and commonages had little or no recreational features available. The attributes of these spaces therefore influenced the reasons for visiting as more than 90 % of the respondents simply used the spaces for transit. With regards to attitudes and preferences towards particular features, they were emerging sense of strong negative feelings towards natural features. Most respondents emphasized the need for green spaces that are well laid out with maintained lawns, recreational facilities and open vegetation. Thus, the current design and available features within the studied urban green spaces do not meet local needs and aspirations and thus do not contribute to better well-being and quality of life as much as they could. Specifically, the

various health benefits linked with being in contact with nature in the public green spaces were not evident in this study. The South African specific context in green space use, perception and people's preferences is thus crucial for urban planning and sustainability.

Key words: urban green space, features, urban dwellers, well-being, quality of life, urbanization, sustainability, ecosystem services.

DECLARATION

I, Amanda Manyani, hereby declare that the work described in this thesis was carried out in the Department of Environmental Science, Rhodes University, under the supervision of Professor Charlie Shackleton and Professor Michelle Cocks. The thesis has not been submitted to a university other than Rhodes University, Grahamstown, South Africa. The work presented here is that of the author unless otherwise stated.

Amanda Manyani

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

GLOSSARY

Green space	Mensah (2014) defined urban green space as the area that is covered by natural or human made vegetation in an urban area.
Ecosystem services	"the capacity of natural processes and components to provide goods and services that satisfy human needs, directly or indirectly." (de Groot *et al.,* 2002: p394).
Feature	Berger *et al.* (2015: p2) describes a feature as "a distinguishable characteristic of a concept (system, component, etc.)" whilst Classen *et al.* (2008: p16) define a feature as a prominent or distinctive user-visible aspect, quality or characteristic of a……. system or systems". For purposes of this study a feature will be described as a distinguishable and visible aspect, quality or characteristic of an urban green space, either natural or artificial.
Quality of life and well-being	The concept of quality of life broadly encompasses how an individual measure the 'goodness' of multiple aspects of their life (Theofilou, 2013). These evaluations include one's emotional reactions to life occurrences, disposition, sense of life fulfilment and satisfaction, and satisfaction with work and personal relationships (Diener *et al.,* 1999). In reviewing literature, quality of life and well-being are terms often used interchangeable, however Smith (1973) proposed that well-being is used to refer to objective life conditions that apply to a population generally, while quality of life should more properly be limited to individual's subjective assessments of their lives.
RDP	Reconstruction Development Program: these were houses built post 1994 to address the lack of housing in South African towns and cities.
Sustainability	"A normatively explicit form of the general term, referring to the capability of maintaining over indefinite periods of time specified qualities of human well-being, social equity and environmental integrity." (Leach *et al.,* 2010: pxiii)
Urbanization	Parnell and Walawege (2014) define urbanization as the process where there is a movement of people from rural to urban areas and people become concentrated in one area.

Urban dwellers According to the Oxford Dictionary (1989) an urban dweller is a person who lives in an urban area (town, city), in this study urban dweller will be used interchangeably with city inhabitants, urbanites, park visitors and residents.

ACKNOWLEDGEMENTS

I would like to express my heartfelt thanks to my family and friends for their tireless support, encouragement and motivation during my study. My mother remains a pillar of strength in all my academic endeavours and I will forever be grateful to have her 'cheering' and supporting me. To the De Wet family for making me have a second home in Grahamstown, I am most grateful.

I would like the thank Professor Charlie Shackleton and Professor Michelle Cocks for their constant support and encouragement during the course of this study. For the intellectual freedom that accompanied that support, I will always be grateful. Funding received from the National Research Foundation (NRF) allowed me to focus full time on this study, and for that privilege I am very conscious. A bursary from the South Africa Netherlands Research Programme on Alternatives in Development (SANPAD) is also gratefully acknowledged, as is a scholarship from Professor Valerie Møller.

Thank you to the community members of Queenstown and King Williams Town for their interest and support during household surveys. Thank you to the Mama Williams for showing us different entry points into the suburbs and helping us talk to respective government officials and municipal managers in study areas. Many thanks to my field assistants, Sipho Vongo, Xolani Maselana and Current Masunungure. I would also like to thank my colleagues (Dennis Radebe and Lindsey Walsh, Menelisi Falayi, Buhlebenkosi Ngwenya) and all members of staff in the Environmental Science Department for their support, especially Ms Nqabisa Booi for help with field work logistics. Many thanks to Dr HGT Ndagurwa and Dr T Dalu for help with data analysis.

To my partner Current, thank you.

Dedication

I dedicate this piece of work to my little angel "Kaelyn Thubelihle Mpala" who passed on during this study.

CHAPTER 1

SETTING THE SCENE

1.1 Chapter overview

This chapter outlines the general understanding of urban green spaces functions, benefits and services from literature around the world. However, most of the work comes from the Global North and are based on westernized views of urban green spaces and the links between nature and human well-being. The chapter focuses on the emergence of green spaces as areas of outdoor recreation within towns and cities and how various features within urban green spaces influence people's attitudes, perceptions and preferences. It then introduces the specific context of South Africa and provides a succinct examination of the literature on the availability and perceptions of green spaces within South Africa, identifying gaps that this research attempts to address. The main research problem is then presented, followed by an outline of the aim, objectives, key questions and lastly, an outline of the thesis.

1.2 Linking urbanization, biodiversity loss and human-nature interactions

More than half the world's population lives in cities and towns and it is projected that by 2050, 66 % of the world's population will be inhabiting in urban areas (United Nations, 2014). In particular, Africa and Asia are urbanizing faster than any other region of the world (United Nations, 2014). For instance, Nigeria's population is projected to increase by at least 212 million, China 292 million and India 404 million urban dwellers by the year 2050 (United Nations, 2014). This on-going process of urbanization poses considerable threats to the compositional, structural and functional elements of biodiversity, as natural spaces are transformed to make way for urban development (Grimm *et al.,* 2008; Seto *et al.,* 2012; Elmqvist *et al.,* 2016). The erosion of urban biodiversity has been well studied. For example, in the United States from the period 1990 to 2000, 1.4 million ha of natural spaces surrounding urban areas was lost, and this amount lost was strongly correlated with population growth ($r=0.85$, $p<0.001$) (McDonald *et al.,* 2010). Similarly, in Osun State, Nigeria, 13.5 % of natural spaces in the peri-urban areas was cleared between 1986 and 2014 to make way for urban infrastructural developments and housing projects (Lasisi *et al.,* 2017).

The continuous loss of natural spaces to urban development reduces the interactions between urban dwellers and nature, an ongoing alienation termed 'the extinction of experience' (Turner *et al.,* 2004; Miller, 2005). Cox & Gaston (2018) identified that the continual spread of urban areas tends to reduce the likelihood of frequent unplanned interactions with nature and increase the necessity of intentionality (e.g. visiting a zoo) to experience such interactions. It is widely accepted that people within urban areas are facing a progressive extinction of experience of nature (Pyle, 1993; Miller, 2005, Soga & Gaston, 2016). According to Miller (2005), the extinction of experience of nature is the continual estrangement of people from naturally occurring spaces. Particularly in more developed countries and regions, over recent decades regular daily contact of people with nature has been in persistent decline (Cox & Gaston, 2018). For instance, in China, a survey of more than 1 000 elementary school students clearly showed that those living in rural environments more frequently interacted with natural environments than did those living in city centres (Zhang *et al.,* 2014). Indeed, the extinction of nature experience has been fuelled by global and regional losses of natural spaces and biodiversity (e.g. Dirzo *et al.,* 2014; Inger *et al.,* 2015). However, it is also important to note that the growth of sedentary pursuits such as watching television and internet browsing (e.g. Pergrams & Zaradic, 2006; Ballouard *et al.,* 2011) has also contributed reductions in visits to and appreciation of nature (Ward Thompson *et al.,* 2008; Shan, 2014), with negative consequences often related to quality of life and well-being (Hartig *et al.,* 2014; Shanahan *et al.,* 2015).

1.2.1 Human-nature interaction

In the last 200 years, there has been a marked shift in the relationship between humans and nature. MacNaughton & Urry (1998: p2) assert that the ways in which people relate and engage with the natural environment, particularly within urban environments, are diverse and "embedded in daily life". Much of the diversity in how people interact with nature is widely reported. For instance, throughout history in the pre-industrial era, various cultural perspectives on human-nature interactions have dominated, from the pursuit of mastery over nature in the quest to tame wild nature, to notions of idealized visions of nature, and the sense of stewardship responsibilities guided by religious beliefs (Simmons, 1993; Bourdeau, 2004). The history and social constructions of human-nature relationships provide important background for examining how people relate to nature in the modern day.

According to Flint *et al.* (2013) the human-nature relationship has also recently been viewed with regards to the various benefits that accrue from nature interactions. Internationally, urban

green spaces are increasingly recognized as one of the few avenues for interaction with nature in urban areas (McLain *et al.,* 2014; Emery & Hurley, 2016). Experiences of nature have been attributed to improving the quality of life of urban dwellers (Chiesura, 2004; Fuller *et al.,* 2007; Palliwoda *et al.,* 2017). Indeed, there is growing empirical evidence that interacting with urban nature delivers a range of measurable human benefits like psychological and physiological well-being, cognitive development, social, spiritual and tangible services (Keniger *et al.,* 2013) (Table 1.1). In the context of the above, understanding the benefits that accrue from interaction with nature within urban green spaces is important for maintaining and improving physical and mental human well-being in a rapidly urbanizing world (Keniger *et al.,* 2013; Shanahan *et al.,* 2015).

1.2.1.1 Context matters

Haase *et al.* (2014) and Botzat *et al.* (2016) suggest that human-nature interactions are contextual and that the landscape setting and behaviour of an individual influences the nature and intensity of interactions. However, it appears that much of the literature on the interaction of people and urban green spaces comes from the Global North (Shackleton, 2012; Haase *et al.,* 2014; Botzat *et al.,* 2016). A review by Shackleton (2012) showed that only 21.4 % of peer-reviewed literature pertaining to urban green spaces and urban greening initiatives came from the developing countries, of which China and India dominated, with only two African countries represented.

Table 1.1. Typology of the benefits of interacting with nature (source: Keniger *et al.,* 2013)

Benefit	Description	Examples
Psychological well-being	Positive effect on mental processes	Increased self-esteem, improved mood, reduced anger/frustration, reduced anxiety, improved behaviour.
Cognitive	Positive effect on cognitive ability of function	Attentional restoration, reduced mental fatigue, improved academic performance, improved cognitive function in children, improved productivity.
Physiology	Positive effect on physical function and/ physical health	Stress reduction, reduced blood pressure, reduced cortisol levels, reduced headaches, respiratory disease and long-term illness, reduced occurrence of illness.
Social	Positive social effect at an individual, community or national scale	Reduced crime rates, reduced violence, social cohesion, social support, facilitated social interaction, enables social empowerment.
Spiritual	Positive effect on individual religious pursuits or spiritual well-being	Increased inspiration, increased spiritual well-being.
Tangible	Material goods that an individual can accrue for wealth or possession	Food supply, grazing land, fishing, fruits and flowers, income.

Similarly, Botzat *et al.* (2016) showed that studies pertaining to people's perceptions on urban biodiversity had a clear geographical focus on Europe and North America with poor representation from Africa and Asia (Figure 1.1). This bias towards developed countries affects the transferability of understandings of human-nature interactions within urban contexts as developing countries have very different socio-economic contexts (Shackleton, 2012; Keniger *et al.,* 2013). For instance, some countries in developing regions have high urbanization rates (United Nations, 2014) resulting in ever changing urban landscapes, thus the perceptions and attitudes of people towards green spaces are constantly changing (Shackleton, 2012). Davenport *et al.* (2011; 2012) reported on the high consumptive use of non-timber forest products in urban landscapes in the Eastern Cape, South Africa, which is rarely noted for most countries in the developed regions (McLain *et al.,* 2014; Emery & Hurley, 2016). Moreover, Luederitz *et al.* (2015) highlight the need for human-nature interactions research to be specific

for a certain setting as there is low transferability between contexts, especially in complex urban settings with heterogeneous socio-economic and ecological backgrounds. Consequently, there has been increasing awareness of and interest towards the benefits that people can receive from nature hence, the urgency by cities to promote the upgrading and development of more urban green spaces (Chiesura, 2004, Fuller *et al.,* 2007; Palliwoda *et al.,* 2017).

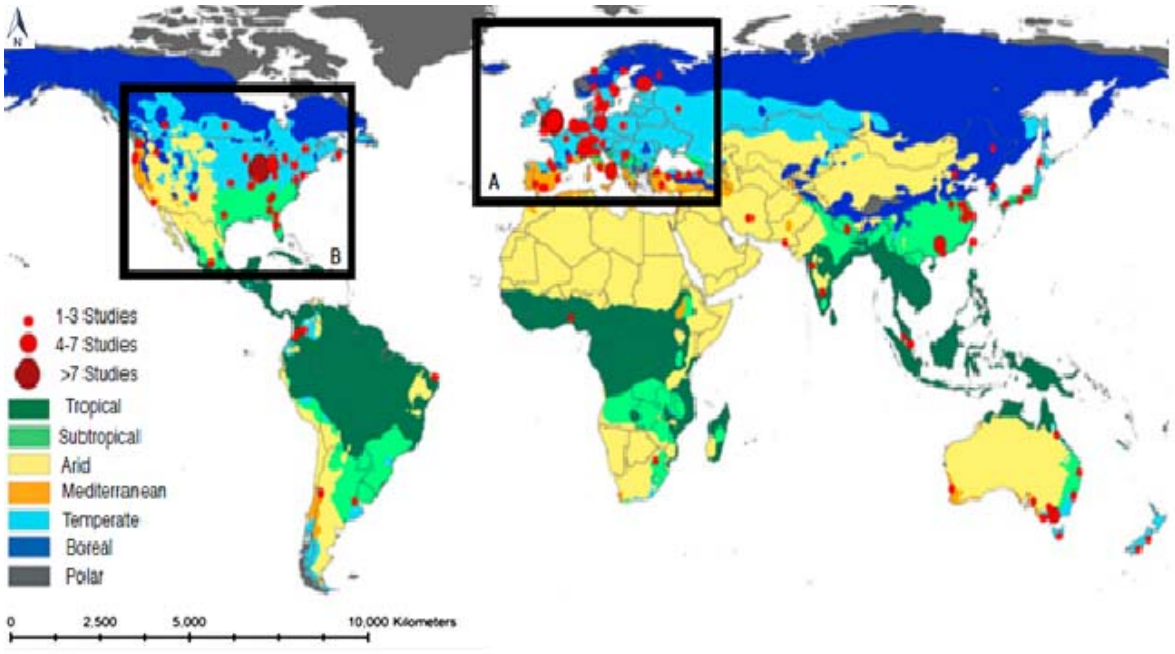

Figure 1.1. Geographic distribution of the 200 reviewed studies on the perception of urban biodiversity. (A, B) Main focus in Europe and North America (source: Botzat *et al.,* 2016).

1.3 Urban green spaces

Schipperijn (2010: p12) defines urban green spaces as "all publicly accessible open space with a high degree of cover by vegetation, e.g. parks, woodlands, natural areas….". The functions and roles of urban green spaces have evolved through time, as exemplified in Figure 1.2. The first way urban green spaces were intentionally promoted is revealed in biblical sources when the Hanging Gardens of Babylon were built by Nebuchadnezzar II around 600 BC (van Leeuwen *et al.,* 2010). In the early 18th century, urban planning emphasized the use of gardening as an ornamental tool, to create pleasant and beautiful towns (e.g. Royal Botanic Gardens, Kew, London) (Cranz, 1982). Today, urban green spaces are an indispensable element of urban quality of life. Green spaces are reported to contain the residual natural assets such as trees, shrubs, herbs and grass in cities and towns (Miller, 2005). Chiesura (2004) reported that these natural assets contribute to the quality of life in many ways. Besides environmental services such as air and water purification, wind and noise filtering or

microclimate stabilization, natural assets within green spaces provide social and psychological services, which are of crucial significance for the liveability of modern cities and the well-being of urban dwellers (Chiesura, 2004; Hartig *et al.,* 2014). Urban green spaces are therefore increasingly promoted to offer an inexpensive health promotion (Hartig *et al.,* 2014; Shanahan *et al.,* 2015) as urbanization continues to impact on well-being and quality of life for urban dwellers. The continuous unfavourable working and living conditions for much of the labour force in England in the 20th century resulted in the incorporation of urban green spaces in urban planning for all people to have better outdoor areas for leisure and recreation to promote the health of the people (Ward Thompson, 2011).

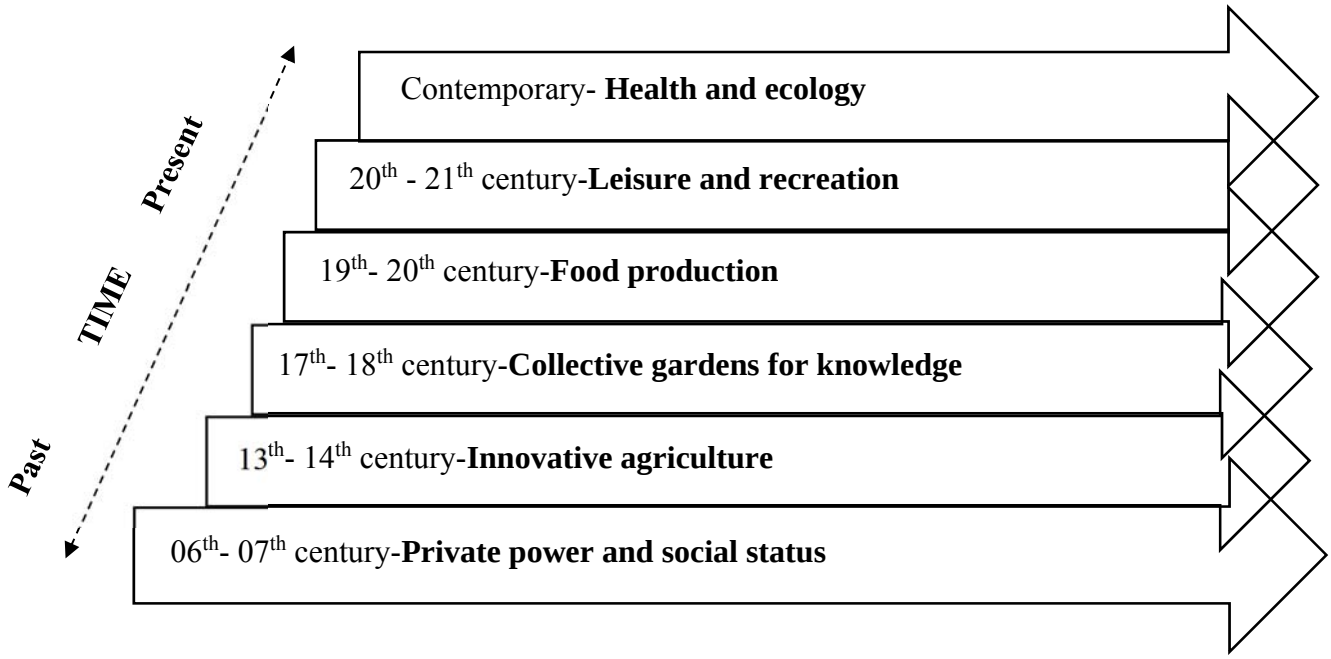

Figure 1.2. The uses of green spaces through history (source: Leeuwen *et al.,* 2010).

1.3.1 Types of urban green spaces

A great deal of work in the Global North has categorized different types of green spaces according to function, size and management regimes (Rupprecht & Byrne, 2014; Braquinho *et al.,* 2015). Urban green spaces are usually divided into two broad categories namely, formal and informal green spaces (Rupprecht & Byrne, 2014; Rupprecht *et al.,* 2015). The former are regarded as clearly demarcated green space areas within urban areas, they are inclusive of parks, botanical gardens, urban forests and cemeteries and these are managed by city agencies (Schipperijn, 2010). The latter, informal green spaces, are said to be ambiguous, in between or liminal vegetated surfaces within towns and cities, they are inclusive of riparian zones, servitudes, vacant lots and spaces in-between buildings (Rupprecht & Byrne, 2014).

A review by Botzat *et al.* (2016) on the perception of urban biodiversity showed that 38 % of the studies focused on urban forests, 33.5 % on urban parks and that other types of spaces were less studied (Figure 1.3). Most studies in urban ecology have mainly have focused on the traditional formal green spaces (parks, botanical gardens, urban forests) (Nielsen *et al.* 2014), with limited research on informal green spaces (vacant lots, riparian zones, unbuilt spaces) (Rupprecht *et al.* 2015) (see Figure 1.3). Formal green spaces have received much attention because they are supposedly public spaces that are provided and maintained by municipal authorities (Swanwick *et al.,* 2003; Özgüner, 2011; Bertram & Rehdanz, 2015). Moreover, many urban parks and botanical gardens are well-endowed with features and amenities such as fountains, manicured flower beds, sideways, rubbish bins, lighting and benches (Jim & Chen, 2006; Özgüner, 2011), most of which are usually absent from informal green spaces (Rupprecht *et al.,* 2015). Yet, different types of urban green spaces such as formal parks, allotments and urban forests are heterogenous and are composed of various features which provide different ecosystem services and offer varied benefits (Graça *et al.,* 2018). This mirrors findings by Kremen (2005) who identified that different types of green spaces offer services which are based on the functional and structural attributes of features in them.

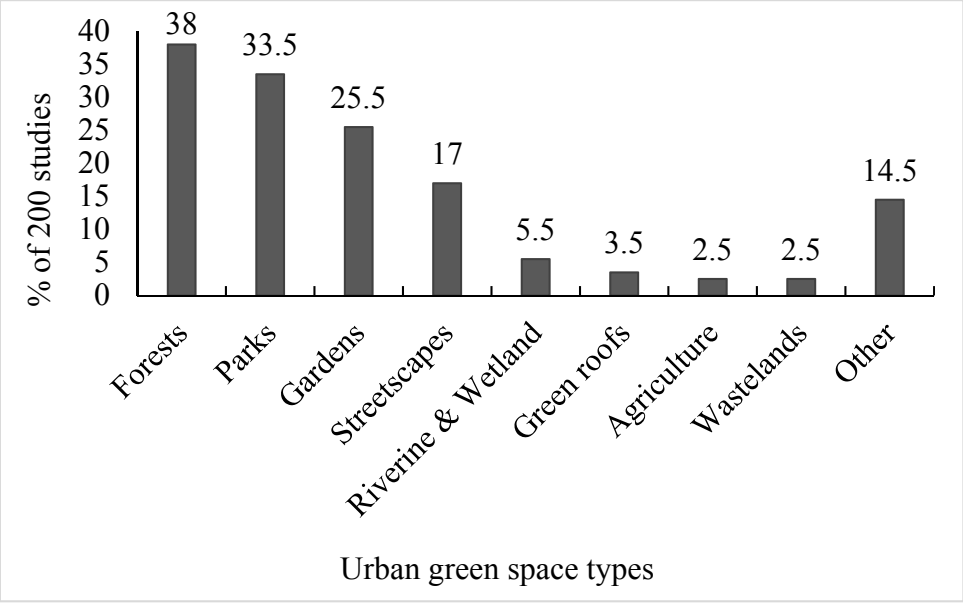

Figure 1.3. The types of urban green spaces studied. The sum of single values exceeds 100 % because many studies addressed more than one urban green space type (source: Botzat *et al.*, 2016).

It has commonly been assumed that the more continuous green space at the edge of a city does not fall under urban green spaces as this area is a transition zone from urban to peri-urban areas

and rural areas (Rossi *et al.,* 2015). Nonetheless, within developing nations the green space at the edge of the city serves various functions for city dwellers and to this end, is sometimes considered as a type of urban green space when dealing with urban studies (Davenport *et al.,* 2011; 2012). In parts of South Africa specifically, the edges may be zoned as urban municipal commonages. Municipal commonages in the history of South Africa referred to land found adjacent to small towns that was granted by the state for the use and benefit of the town's poor residents (Anderson & Pienaar, 2003; 2004; Ingle, 2006). However, with the transition of the government in South Africa and deepening socio-economic crisis, municipal commonages have thus been used to supplement income for the increasing number of people coming to towns and cities by offering land for subsistence agriculture (Davenport *et al.,* 2011). On the other hand, Cartwright *et al.* (2002), Anderson & Pienaar (2003) and Ingle (2006) have identified the municipal commonage as a place for collecting fuelwood and building materials, vegetable production for food security as well as recreation, ablution, housing, refuse disposal and even sewage treatment works. Such landscapes have therefore been incorporated in urban studies as some urban dwellers use them on a daily basis for different purposes (Davenport *et al.,* 2011; 2012). Various works from the Global North overlook the functions that municipal commonages serve to urban dwellers thus most studies about their uses and perceptions are restricted to southern Africa particularly South Africa (Anderson & Pienaar, 2003; Ingle, 2006; Davenport *et al.,* 2011; 2012). Because of their diverse nature, this study will consider municipal commonages as another type of urban green space independent of formal and informal green spaces. One critical challenge is therefore, to identify the 'type of urban green space' because the diversity and design of urban green spaces purportedly influences the various benefits the users receive (Jim & Chen, 2006; Lin *et al.,* 2014; Shan, 2014).

1.3.2 Benefits of urban green spaces

Urban green spaces offer a variety of benefits that cannot be over emphasized. Chiesura (2004), Keniger *et al.* (2013) and Palliwoda *et al.* (2017) identify the various benefits that arise from interacting with nature in urban green spaces. These are classified under social, environmental, psychological and physiological benefits. Schipperijn (2010) used a model to categorize the benefits of urban green spaces (Figure 1.4). Section A of the model indicates the elements that influence the use of urban green spaces and user individual elements such as gender, age and preferences. Section B of the model illustrates that the behaviour of an individual within the green space (e.g. walking, sitting, reflecting) will influence the type of benefits that the user

acquires. Section C of the model represents the variable outcomes associated with green space use.

1.3.2.1 Physiological benefits

Urban areas contain many potential stressors such as noise, traffic, dense crowds and crime. Evidence indicates that interaction with nature in green spaces can alleviate some of the negative impacts of these stressors (Keniger *et al.*, 2013). For example, in a hospital in Pennsylvia, United States, Ulrich (1984) found that the recuperation period of patients in a hospital room with a window-view of trees was less than for patients with a view of a brick wall. Patients with a view of trees also required lower dosages of pain killers, had fewer postsurgical complications and also received fewer negative evaluative comments from the hospital staff. In the Netherlands, an experimental study exposed participants to a stress-inducing activity and then measured cortisol levels following being subjected to half an hour of either indoor reading or outdoor gardening. Findings showed that those exposed to gardening had lower levels of cortisol (Van den Berg & Custers, 2011). The above findings were suggested to be a physiological response to an outdoor activity.

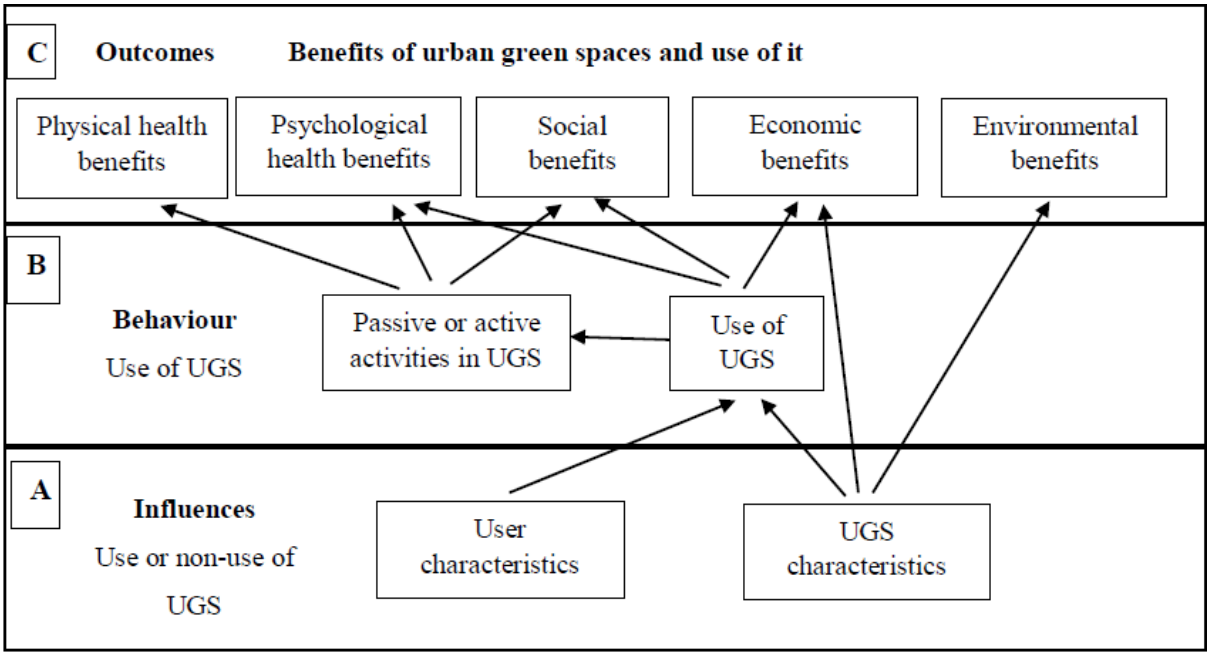

Figure 1.4. A model for the benefits of urban green space (source: Schipperijn, 2010)

1.3.2.2 Psychological benefits

Increasing empirical evidence has revealed that there are positive outcomes to psychological well-being which arise from nature interaction within urban green spaces. Shanahan *et al.* (2015) found that a longer duration of visiting an urban green space was significantly linked to

a lower prevalence of depression in Brisbane City, Australia. The authors interpreted this as evidence that visiting urban green spaces for longer durations improved an individual's psychological well-being. Similarly, Pretty *et al.* (2005) compared the emotional responses of respondents exposed to a sequence of natural and urban landscape images whilst in a gym. Positive mood and self-esteem improved more with exposure to natural scenes, suggesting that an individual can exercise more and attain greater benefits in the presence of nature. Despite such, a review by Keniger *et al.* (2013) reports that some studies found little or no relationship between the setting in which one is exposed to and the psychological well-being benefit. For instance, in Japan Kerr *et al.* (2006) showed that participants had positive emotions after an exercise in a gym and in a green space, regardless of the exposure in different settings (Kerr *et al.,* 2006). Consequently, the psychological benefits accrued after visits to urban green spaces are subjective to a lot of factors.

Kaplan (1983) hypothesized that interacting with nature is restorative, thus contributing to attention recovery and reducing mental fatigue. In Michigan, United States of America, the restorative benefits of urban green spaces were investigated by measuring the satisfaction that participants received by their views of urban green spaces through the window. Findings revealed that satisfaction increased with views of more natural content from the windows (Kaplan, 2001). According to Han (2010) different types of green spaces with regards to the density of vegetation and diversity of other species influence the restorative potential. For instance, Fuller *et al.* (2007) showed that the restorative benefits to park users varied with plant species richness. The parks which had a higher species richness showed higher opportunities for reflection and thus improved attention restoration for users. Consequently, they advocated that the management of these urban parks should emphasize a mosaic of habitats, which will enhance species richness, ensure ecosystem service provision and thereby improve the well-being of the human urban population.

1.3.2.3 Social benefits

Exposure to urban green spaces contributes to urban dweller's everyday moods as they provide spaces where people can meet and interact (Peters *et al.,* 2010), reduce incidences of violence (Kuo & Sullivan, 2001a) and also foster social empowerment (Westphal, 2003). Social benefits manifest as either cultural or spiritual benefits. Studying a sample of 98 apartment buildings in Chicago, Kuo & Sullivan (2001a) found that incidences of crime, as measured by police crime reports, were significantly lower in buildings surrounded by dense vegetation. Yet, Lindgren & Nilsen (2012) found that densely vegetated spaces increased perceived fear of crime among

urban green space users. Thus, urban vegetation provides opportunities for relaxation and happiness among people but also has potentially negative feelings which can arise from its presence.

Urban green spaces also provide places for recreation, relaxing and play areas for various user groups (Zhang *et al.,* 2013; Betram & Rehdanz, 2015). Betram & Rehdanz (2015) identifies urban green spaces, particularly parks, as spaces for recreation. For instance, Özgüner (2011) found that the main uses of urban parks by Turkish people were for picnics and barbeques . In contrast, the Dutch were found to enjoy recreation in urban parks by sitting, resting and relaxing (Gobster, 2002). In Bari, Italy, Sanesi & Chiarello (2006) found that 24 % of their respondents used urban green spaces as a meeting place and for leisure purposes. Without doubt, various types of urban green spaces provide opportunities for different forms of leisure for people in different parts of the world and therefore these spaces should be incorporated in urban planning processes.

Urban green spaces provide opportunities for urban dwellers to feel connected to a broader reality (Williams & Harvey, 2001), increase inspiration (Chiesura, 2004) and offer cultural benefits (Cocks & Wiersum, 2003). Some urban green spaces represent important places for certain cultural and religious groups as they harbour some important tree species or plant species (Philpot, 2004; Dafni, 2007). According to Ouinsavi *et al.* (2005) public urban green spaces are important in Benin, because they contain the tree species *Milicia excelsa* which is of high cultural value to people in this community. In like manner, the amaXhosa in South Africa hold urban green spaces to high values as they use these spaces for collection of species like *Ptaeroxylon obliquum* and *Olea europaea* subsp. *africana* which are used for various traditional ceremonies (Cocks, 2006). In Shackleton *et al.* (2015) study, a participant describes trees as life to them, representing the close ties that people have with particular features of urban green spaces. Kala *et al.* (2006) identifies that various plant species are used for both medicinal as well as religious purposes within urban green spaces by Hindus in northern India, therefore contributing to their cultural heritage.

1.3.2.4 Economic benefits

Urban green spaces provide economic benefits to people which are tangible or intangible (Tyrväinen *et al.,* 2005). Tangible benefits include consumptive goods such as firewood, fruits and medicines which can be sold or consumed such that the family does not have to spend cash on the goods (Cocks, 2006; Kaoma & Shackleton, 2014). For example, in Durban, South

Africa, Mander (2004) reported that 75 % of the medicinal plants sold in the local market were collected from the urban forest. Thus, in developing countries in sub-Saharan Africa, urban green spaces offer a livelihood for urban dwellers from the income generated from selling various urban green spaces products.

Intangible economic benefits which accrue from urban green spaces include aesthetic beauty which rises property prices and attractive places which boost the tourism sector. According to Harnik & Welle (2009) there is a general willingness to pay more for a home that is within close proximity to a park. Similarly, Smith (2010) reported that an assessment in London, (United Kingdom) found a strong positive correlation between property value and close proximity to green spaces. Consequently, house values were increased if a green space that was within one kilometre from the property, adding two to three percent to house prices. Parks play a role in an area's economy through tourism as some are good venues for festivals and sport events (Harnik & Welle, 2009). In San Diego, United States of America, 5 % of the tourism income for 2007 was because of the city's parks providing approximately US$ 114 million (Harnik & Welle, 2009). Aesthetic, historical and recreational values of urban parks increase the attractiveness of cities and promote them as tourist destinations, and in so doing generate employment and revenues (Chiesura, 2004). Great Britain receives 16 million garden visitors annually, with this sector increasing every year since the 1970s (Connell, 2004).

1.3.2.5 Consumptive benefits

Increasing evidence shows that with high influxes of people into urban areas there is increasing dependency on urban green spaces for non-timber forest products like mushrooms, fruits, and herbs for consumptive purposes (Davenport *et al.,* 2011; 2012; Chinyimba, 2012; Kaoma & Shackleton, 2015). According to Palliwoda *et al.* (2017) 60 % of the people who visited urban parks in Berlin, Germany, gathered plants for consumption purposes. Consumptive purposes in the above study included people eating species in-situ, taking them to their homes for salads and also collecting them for different teas. This corroborates McLain *et al.* (2014) who identified that urban dwellers collect edibles like berries, young shoots and nuts in urban parks of New York for the main purpose of eating. In developing countries, mostly poor people gather wild plants for income, food, firewood and timber for building (Gopal & Nagendra, 2014; Shackleton *et al.,* 2015). For example, approximately 20 % of household income was derived from urban tree non-timber forest products in three small towns in South Africa (Kaoma & Shackleton, 2015). Reyes-García *et al.* (2005) and Cruz *et al.* (2014) pointed to that most

gathering of food in urban green spaces is done by women and is also done across different cultures.

1.3.2.6 Environmental benefits

Urban green spaces provide an array of means of enhancing the quality of air, soil, water and biodiversity (Young, 2010). Urban green spaces improve air quality in that they remove dust particles, absorb a number of pollutants, sequester carbon dioxide and can also act as a noise buffer (Jo, 2002; Escobedo & Nowak, 2009). In Santiago, Chile, for example, Escobedo & Nowak (2009) modelled the effect of urban green spaces in improving air quality and showed that particulate matter had highest concentrations in places with low vegetation density and was lowest concentrations in places with higher vegetation density. Urban green spaces provide habitats for small to medium-sized animals and also provide corridors for different patches to connect (Angold *et al.,* 2006). People's domestic gardens within urban environments also offer habitats for birds to nest and feed (Davies *et al.,* 2009).

Urban green spaces also reduce the amount of surface run-off in urban areas (Tyrväinen *et al.,* 2005). High rates of infiltration reduce the occurrence of floods and soil erosion which can be caused by high surface run-off (Whitford *et al.,* 2001). McPherson *et al.* (2005) reported that 1.3 million trees can absorb up to seven billion tons of rainwater each year thereby reducing floods. Furthermore, urban green spaces reduce the heat island effect by direct shading, evapotranspirative cooling and retention of water. According to Spronken-Smith & Oke (1998) vegetated urban parks are likely to be cooler than their surrounding built environment. In Vancouver, urban parks are normally 1-2^{o}C cooler than their surroundings and this helps in cooling urban areas because park cooling forms larger zones of advection beyond the park borders (Spronken-Smith & Oke, 1998). Vegetation belts within urban green spaces reduce the transmission of intrusive noise from roads or factories; the wider the vegetation belt the greater the effect on reducing noise (Onder & Kocbeker, 2012).

1.4 Features within urban green spaces

Most of the literature on urban green spaces operates at the scale of an individual green space or of all green spaces in a neighbourhood or a city (Botzat *et al.,* 2016). Yet, there is a variety of finer scale features and processes that influence how urban dwellers perceive and use urban green spaces and hence the benefits they experience. Urban green spaces are made up of various features including, for example, green areas, water bodies and attractive landscape architecture and amenities such as play areas, benches and fountains (Leeuwen *et al.,* 2010; Zhang *et al.,*

2013). In Guangzhou, China, Jim & Chen (2006) found that urban parks which boasted different landscape designs with elements of vegetation and artificial recreational features attracted more visitors. Similarly, Adinolfi *et al.* (2014) showed that the number of visitors to urban green spaces in Granada, south-eastern Spain, was mainly influenced by the specific functions provided by each type of green space. In addition, Ghavampour *et al.* (2015) and Harris *et al.* (2018) suggest that the user's experience of urban green spaces is influenced by the availability and design of artificial and natural features within urban green spaces. Yet, most studies have focused on the natural features of green spaces (Chiesura, 2004; Fuller *et al.,* 2007; Botzat *et al.,* 2016) with limited work reporting on the uses and perceptions of artificial features within urban green spaces (Özgüner, 2011; Zhang *et al.,* 2013; Bertram & Rehdanz, 2015). For example, Jim & Chen (2006) point out that as a quest to preserve nature within urban green spaces in Guangzhou, China, artificial features have largely been trimmed in landscape design. In addition, Haase *et al.* (2014) identifies that there is a scarcity of studies investigating urban green spaces at finer scales, addressing for instance, differences in type and features of green spaces. Therefore, to have a comprehensive understanding of the features within different types of green spaces, it is important to explore and understand the appreciation of both artificial and natural features within urban green spaces.

1.4.1 Natural features

Natural features found within urban green are inclusive of plant, animal and biophysical attributes (e.g. trees, rivers, grasses, ponds, herbs, shrubs, birds, butterflies, insects and small animals) (Chiesura, 2004; Bjerke *et al.,* 2006; Fuller *et al.,* 2007; Nielsen *et al.,* 2014). A global review by Botzat *et al.* (2016) revealed that most peer-reviewed studies focused on plants (87 %), with an over representation of woody plants (trees, shrubs), and less representation of non-woody plants (herbs, grasses). Animal presence was also considered in some studies with results indicating most focused on birds (37 %), invertebrates (22 %), mammals (9 %) and reptiles (6.5 %).

1.4.1.1 Woody plants (trees, shrubs)

Woody plants such as trees can be considered as key features for most urban green spaces and are therefore important for environmental quality and quality of life of urban dwellers (Duinker *et al.,* 2015). Environmentally, trees and shrubs help to moderate the urban climate (Ng *et al.,* 2012), reduce levels of some pollutants, including gases and particulate matter (Vailshery *et al.,* 2013), reduce runoff and flooding (Armson *et al.,* 2012) and also reduce noise levels or

annoyance (Van Renterghem and Botteldooren, 2016). But they may also negatively affect some people's health as some trees release pollen which aggravates allergies (DelleValle *et al.,* 2010).

Woody plants can reduce levels of gaseous particles in the air (e.g. nitrogen oxides, sulphur oxides, particulate matter) (Fowler, 2002). Blanusa *et al.* (2015) found that *Platanus hispanica* and *Tilia cordata* leaves intercepted and retained sodium chloride aerosol and talcum particles more efficiently than *Olea europea*, *Quercus cerris*, and *Quercus ilex* leaves. There is also evidence that trees can impede the localized dispersion of pollutants since they reduce air movement particularly in restricted spaces within urban environments (Karl *et al.,* 2010). Trees also indirectly benefit air quality by moderating the urban climate. In summer time, trees provide shading which consequently cools buildings through the effects of evapotranspiration (Pauleit & Duhme, 2000). According to Tyrväinen *et al.* (2005) trees are the most effective vegetation element for reducing temperatures in urban areas. With regards to trees releasing pollen which aggravate allergies, Lovasi *et al.* (2013) showed that there was a significant association between tree canopy extent and asthma and allergic sensitization in a New York City birth cohort. Yet, the presence of trees and shrubs within urban green spaces has also been linked with positive benefits for human well-being and health. Sugiyama *et al.* (2009) suggest that the presence of trees within urban green spaces is a strong motivation for people to participate more in outdoor activities, thus having a positive impact on their health. In similar fashion, Fuller *et al.* (2007) found that the diversity of trees and shrubs within urban parks of the United Kingdom positively influenced the psychological well-being of green space users.

Within the developing world, trees are also highly valued by urban dwellers for economic, spiritual and cultural benefits. In research investigating the low income areas of South African towns, one respondent highlighted the importance of *Colophospermum mopane ("I don't how life would have been for us without this tree (Mopani tree)….")* as a source of mopane worms which could be sold for income Shackleton *et al.* (2015: p80). In addition, specific trees within some green spaces hold high cultural value (Chinyimba, 2012; Shackleton *et al.,* 2015). For instance, more than 50 % of the respondents in Bela-Bela, South Africa, cited specific trees like *Mundulea sericea, Peltophorum africanum and Ochna cinnabarina* which are used for protection of new borns, cleansing the family of any deceased person of the spirit of death and chasing away witches at night. However, sometimes the positive benefits of trees and shrubs are countered by concerns about crime and fear of crime in green spaces with woody plants (Jorgensen *et al.,* 2002; Shan, 2014). There is a growing consensus that the negative

perceptions about woody plants are as a result of the lushness of the vegetation and the density of the trees and shrubs per given space (Bjerke *et al.,* 2006; Hofmann *et al.,* 2012). The preference for green spaces with moderately dense woody plants therefore suggests that people prefer green spaces that offer "both prospect (to see) and refuge (not to be seen)" (Botzat *et al.,* 2016: p227).

1.4.1.2 Non-woody plants (grasses, herbs)

The presence of ground cover, specifically lawn, makes for a good playground for children (Woolley, 2006; Zhang *et al.,* 2014), a good place to sit while picnicking, talking and socialising (Özgüner, 2011; Bertram & Rehdanz, 2015) and enhancing aesthetic beauty (Lindemann-Matthies *et al.,* 2010; Kendal *et al.,* 2012). According to Özgüner (2011) in urban parks of Turkey, recreation grounds with the presence of a well-manicured lawn were highly preferred sites for picnics and barbeques. However, overgrown lawn deters some users from the green spaces (Nielsen *et al.,* 2014; Sreetheran & van den Bosch, 2014). The presence of colourful grass and flowers also draws people to green spaces. For instance, in western Europe, people liked diverse meadows containing very colourful flowers (Lindemann-Matthies *et al.,* 2010).

Until recently, the herbaceous layer of urban green spaces had been considered for non-consumptive purposes only (Emery & Hurley, 2014; McLain *et al.,* 2014). However, recent studies have shown that there is widespread collection of herbs within urban green spaces for various purposes (McLain *et al.,* 2014; Palliwoda *et al.,* 2017). According to Palliwoda *et al.* (2017) 12 % of visitors in Berlin's parks collected plants for various purposes; of which 58 % were herbs growing in the lawns. In South Africa, the gathering of non-woody plants such as *Amaranthus hybrids*, *Sonchus asper* and *Chenopodium album* is an important activity for the amaXhosa as these plants are used for their traditional purposes (Cocks *et al.,* 2016). In Rio De Janeiro's urban periphery phytotherapeutic pharmacy through use of medicinal plants has resulted in many people resorting to medicinal plants for treatment since most of the people have limited access to proper clinics and hospitals (Brown, 2016).

1.4.1.3 Animals

Jim & Chen (2003) postulated that urban green spaces act as refugia for animals in cities since large areas of cities are now paved and concreted. Birds are often appreciated in green spaces because of their different unique calls, colours and their movements (Peris & Montelongo, 2014). For example, Kjellgren & Buhrkall's (2010: p469) identified one participant who noted

that, “The singing of the birds makes me feel relaxed,” and a participant in Fredrickson & Anderson’s (1999: p31) reports, “It was so incredible being able to hear the birds…”. Thus, bird calls are related with positive experiences in outdoor settings like green spaces (Peris & Montelongo, 2014). In urban and peri-urban green spaces of south-east England, Ratcliffe *et al.* (2013) identified that bird calls were the most salient source of restorative experiences with most commonly mentioned sounds (35 %), followed by water (24%), non-avian animals (18%), elements (12%) and other sounds such as interaction with nature and silence (11%). However, the presence of some types of birds symbolises negative phenomena for other cultures. For example, the occurrence of an owl around the places of residency and close to green spaces around people’s homes in southern Africa is considered as harbinger of bad luck as it is associated with death of a family member (Mutwa, 1996).

Bjerke & Østdahl (2006) found that birds, squirrels, butterflies and hedgehogs were among the most loved urban animals in the city of Trondheim, Norway. Findings of this study also pointed to people preferring birds, butterflies and squirrels for contributing to the natural feel, showing change of seasons and also because of their vivid beauty (Soga & Gaston, 2016). However, increasing empirical evidence suggests that people have negative perceptions about different wildlife in urban green spaces since they believe they bring diseases, harm and annoyance. For example, in the United States, raccoons and skunks are reservoirs of diseases such as leptospirosis and parasites, which are easily transmitted to humans, thus people shun away from public parks where they frequent occur (Gehrt, 2004). Another prominent negative impact of wildlife-human interactions within urban green spaces is animal attack on green space users. According to Conover (2002) attack by mountain lions, coyotes and venomous snakes pose the biggest threat to people visiting urban green spaces and also a problem to domestic pets such as dogs and cats. Martín (2005) identifies that dogs which are brought along to parks or hiking trails are at a risk of being bitten by snakes, especially since not all owners take their dogs to negative reinforcement training classes, which teach dogs to avoid snakes. To a lesser extent, insects and pests are mentioned in studies of urban green spaces, however, where they are mentioned it was unclear how people felt about their presence (Jim & Chen, 2006).

1.4.1.4 Water

The presence of water in rivers, springs and ponds are regarded as focal points in some green spaces (Gobster, 2002; Özgüner, 2011). The availability of water bodies in urban green spaces brings about the “non-visual” benefits from nature, like taking in fresh air and the feeling of serenity (Gobster, 2002: p154). The sounds of splashing water are attractive to many green

space users (Gobster, 2002). For example, in Shenzhen Overseas Chinese Town, Chen *et al.* (2016) found that the number of water landscapes within the urban parks affected the number of visitors, a general model further pointed that water landscapes are expected to attract 73 and 88 visitors to stay on weekdays and weekends, respectively. Thus, water landscapes influence diversified activities like fishing, swimming, photographing, and sightseeing, which consequently attract more urban green space users (Kaczynski *et al.,* 2007). In economic terms, in the Netherlands, the prices of properties overlooking green spaces with water were higher (Luttik, 2000). Ecologically, the presence of water increases habitat heterogeneity, thus increasing the biodiversity of some green spaces (Nordh *et al.,* 2009; White *et al.,* 2010). Furthermore, Yang *et al.* (2016) shows that out of a sample of six urban parks in Beijing, China, the two parks which had a high coverage of water had the highest potential of cooling the urban areas around the parks. However, the presence of water has been linked with negative perceptions from some green space users (Özgüner & Kendle, 2006). For instance, ponds, fountains and streams within urban green spaces act as breeding grounds for mosquitoes which can negatively impact the health of urban dwellers (Özgüner & Kendle, 2006). Similarly, in Kya Sands, Johannesburg, undrained water ways in urban green spaces store stagnant water which result in foul smell thus, reducing the attraction of these spaces (Adegun, 2018). The presence of rivers, swimming pools and dams in urban areas has also been linked with incidences of drowning and fear of drowning particularly children. For instance, in South Africa, Saunders *et al.* (2018) found that with the exception of the coastal city of Port Elizabeth, where 76.4 % of drownings occurred in the sea, approximately half of drowning incidents occurred in and around the home (Johannesburg 51.6 %, Pretoria 46.7 %) in places like public swimming pools, dams, lakes and rivers.

1.4.2 Artificial features

There is increasing evidence that some urban green space users do not respond positively to natural features within urban green spaces, but rather they find these areas untidy, ugly and at times frightening (Burgess *et al.,* 1988; Özgüner & Kendle, 2006; Zhang *et al.,* 2013). Consequently, more attention has been placed on the artificial components within certain green spaces to satisfy the needs of various visitors (Betram & Rehdanz, 2015; Chen *et al.,* 2016). Different artificial features serve different uses within urban green spaces, some are available for people to partake in active engagements (playing with children, sports activities, jogging) whilst others are for more activities passive (picnicking, talking, socializing) (Swanwick *et al.,* 2003; Özgüner, 2011; Bertram & Rehdanz, 2015).

Park benches, shelter, lights, side-walks, play equipment, sports facilities and barbeque areas are the most mentioned artificial features of urban green spaces (Özgüner, 2011; Zhang *et al.,* 2013; Bertram & Rehdanz, 2015). For example, Swanwick *et al.* (2003) and Zhang *et al.* (2013) found that the presence of comfortable seating and shelter was associated with high frequency of visits to urban parks in Europe and China. According to Chen *et al.* (2016) an additional bench in public parks of Shenzhen, China, attracted five additional visitors to the green space, furthermore, they observed that during the weekends all available benches were mostly occupied with some elderly people resorting to using auxiliary seats. Thus, if the green spaces have more benches and seating areas, park users would be encouraged to stay, which would further promote visitors to participate in leisure and strengthen community cohesion (Peters *et al.,* 2010).

In addition to seats and benches, there is also a general consensus that the availability of lights increases surveillance within urban green spaces, thus areas with more lighting attracting more visitors (Jim & Chen, 2006; Zhang *et al.,* 2013; Chen *et al.,* 2016). For instance, Aldinolfi *et al.* (2014) showed that out of 10 parks studied in Granada, Spain, Cruz de Lagos Park received very low numbers of visitors despite being located in the city's most densely populated districts. This was linked to that some areas of Cruz de Lagos Park were less visible, and surveillance was inadequate, with some respondents stating that they were scared to walk past the park, particularly at night, due to poor lighting. According to Jorgensen *et al.* (2002) the prospect of surveillance increases feelings of safety, thus increasing preference for the green space.

With regards to play equipment and sports facilities, Özgüner (2011) shows that the availability of children's playground in two popular urban parks of Isparta, Turkey, was the second-most mentioned reasoned for visiting the green spaces. Similarly, Sanesi & Chiarello (2006) showed that 26 % of respondents of the study population in Bari, Italy, visited urban green spaces as they were fun areas for children to play. Furthermore, Shan (2014) revealed that to exercise was the third most mentioned motive of visiting green spaces in Guangzhou, China, emphasising the importance of play equipment and sports facilities. The appropriate artificial features were also seen to enhance other activities being done in the green space (Wendel *et al.,* 2012), because when people get to sit in green spaces, there is a chance of interaction with other people, thus the availability of proper artificial features fostering social cohesion and interaction (Peters *et al.,* 2010).

Some formal green spaces like parks, memorial parks and botanical gardens contain modern art forms and landscape architecture which can be used for educational purposes. These include historical sculptures which tell a particular story about a town or city (Faggi & Ignatieva, 2009; Fischer *et al.,* 2016). Such features are appreciated by those who seek to be inspired or are interested in photography (Swanwick *et al.,* 2003; Özgüner, 2011). For example, within Centenary Park, Bulawayo, and the Company's Gardens, Cape Town, prominent colonial figures of Cecil John Rhodes and Van Riebeek are displayed and these attract people taking photographs and also reading about the history of the people whom the figures represent (Green *et al.,* 2014; Ngulani, 2016). However, the colonial figures within urban parks have been seen to deter people from visiting parks as they represent negative aspects of colonial history (Green *et al.,* 2014; Ngulani, 2016). Furthermore, the availability of sculptures of different historical figures in urban parks also serves as educational material for the younger generation (Jim & Chen, 2006; Özgüner, 2011).

It is well appreciated that some urban green spaces serve various purposes like offering places for jogging (Shan, 2014), walking dogs (Dunnett *et al.,* 2002) and areas of transit (Latham, 2008). Takano *et al.* (2002: p913) refers to such spaces as "walkable green spaces" and assert that the presence of walkable green spaces positively influences the longevity of the elderly residents in Tokyo, Japan. According to Giles-Corti *et al.* (2005) a thoughtful design is to be followed when creating pathways in green spaces as this influences the number of people who will use the park and consequently the benefits to the user. For instance, Chen *et al.* (2016) found that wide paved pathways had a high use rate in comparison to the more secluded and narrower pathway (Figure 1.5). Furthermore, the placing of footpaths needs to consider the features beside the path as this can influence the number of people wanting to partake in walking activities. Placing benches, lights and water taps can influence more walking along pathways (Takano *et al.,* 2002; Giles-Corti *et al.,* 2005).

(a) (b)

Figure 1.5. A walking path crossing densely covered woodlands. (a) Narrow walking path without visitors; (b) Wide walking path with few visitors (source: Chen *et al.,* 2016).

Chen *et al.* (2016) argued that it is not enough to provide benches, walkable pathways and lighting in the urban green spaces, but also adding commercial facilities within urban green spaces can attract large numbers of visitors who can then partake in different activities in the spaces. For instance, in Shenzen, China, the total activity density in the park next to a shopping mall (War-Mart) increased during weekdays and weekends by five times more than other parks. As the distance from Wal-Mart increased, the activity density decreased sharply (Chen *et al.,* 2016). In similar fashion, Adinolfi *et al.* (2014) showed that in two of the parks studied in Granada, Spain, there were kiosks selling drinks. But while the kiosk in Zaidin Park was always open but rarely used, visitors to the other park (Almunia de Aynamandar Park) cited that they opted for Almunia de Aynamandar Park because at Zaidin Park the service was of poor quality. Thus, addition of commercial facilities within urban green spaces can influence the visitor behaviour of park users. In addition, the presence of parking space for park visitors can limit visits to green spaces if these facilities are not available or inadequate (Zhang *et al.,* 2013; Betram & Rehdanz, 2015).

1.5 Constraints to urban green space use

Researchers have deduced four ‘classes of factors’ or types of constraints that underpin the lack of use of some green spaces (Hultsman, 1995; Jackson & Witt, 1994). These are:

a) personal or internal constraints (e.g. fear of crime, motivation, interest, depression);
b) social constraints (e.g. lack of companions, family responsibilities);

c) structural constraints (e.g. time, money, poor transportation) and;
d) institutional constraints (e.g. user fees, park programming) (Crompton & Kim, 2004; Henderson & Bialeschki, 2005; Burns & Graefe, 2007).

In addition, other works have identified that the pre-existing condition, for example, poor maintenance, lack of safety features of urban green spaces and accessibility reduces the willingness to visit green spaces (Van Herzele & Wiedeman, 2003; Giles-Corti *et al.,* 2005).

According to Byrne (2012), personal constraints, social constraints and structural constraints have received the most attention. With regards to personal constraints, the perceived fear of crime within green spaces has received the most attention (Byrne, 2012; Sreetheran & van den Bosch, 2014). For example, Adinolfi *et al.* (2014) identified that in Cruz de Lagos Park, Granada, visitor numbers were always low, which was attributed to the perceived risk of crime from people who were consuming alcohol within parts of the park. Sanesi & Chiarello (2006) corroborated the findings above as harassment of different types was an issue mentioned by 25 % of the respondents which prevented particularly people under 25 years of age from visiting parks of Bari, Italy. In South Africa, according to the Victims of Crime Survey 2016/2017, 32 % of people out of a sample of 30 000 reported that they were scared to walk in urban green spaces as they felt like they can be targeted for crime. The density or lushness of vegetation within some green spaces is regarded as areas for concealment for robbers and other criminals. As an example, Zhang *et al.* (2013) showed that in comparison with the average value of the items belonging to the factor of vegetation using a Principal Component Analysis, the item of plant density received the lowest preference rating (3.54) which translates to that respondents prefer more open spaces and the more densely wooded landscapes are less attractive. Green spaces have been identified as important places for play for children (Ward Thompson *et al.,* 2008) however, some have also been identified as places where acts of bullying and crime occur (Sreetheran & van den Bosch, 2014). Media reports of negative instances towards children result in parents being more careful and not allowing their children to play in green spaces, hence reduced visits to urban parks (James & Embrey, 2001).

With regards to institutional constraints, the low maintenance of green spaces is also a deterrent to visiting green spaces (Özgüner, 2011; Zhang *et al.,* 2013; Adinolfi *et al.,* 2014). The failure of the authorities to repair aging facilities, lack of caretakers and defects in the planning and setting up of some landscape structures is a barrier for some users (Sanesi & Chiarello, 2006). For example, danger from syringes was cited by 34 % of respondents as the major deterrent,

following substandard facilities (24 %) in urban parks in Bari, Italy. Similarly, Özgüner (2011) revealed that lack of cleaning and maintenance was the most cited deterrent for park users in Isparta, Turkey. In addition, Sreetheran & van den Bosch (2014) asserted that the presence of graffiti, old cars and piles of rubbish results in an 'eye sore' for potential green space users. In general, vandalised structures, piles of rubbish and in some instances homeless people who stay in green spaces, portray an unclean environment to the onlooker, hence reduced visits (Brownlow, 2006; Lindgren & Nilsen, 2012). In addition, the placement of certain features such as access gates, ramps and the type of fencing can deter people from visiting a green space (Özgüner & Kendle, 2006; Sreetheran & van den Bosch, 2014). Adinolfi *et al.* (2014) identifies that the type of walkways affects transit, particularly the failure of provision of access ramps for the disabled limits their visits to the spaces.

Other emerging studies on non-use of green spaces reveal that the politics of culture, race and ethnicity play a major role in who visits a green space and who does not (Byrne, 2012; Sreetheran & van den Bosch, 2014). The ideologies of how a green space should look or what it should contain influences people from different races and cultures to visit a given green space or certain parts of the green space (Gobster, 2002). For example, in Lincoln Park, Chicago's largest park, white people preferred the more densely vegetated areas of the park whilst black people preferred areas which were open and had greater surveillance (Gobster, 2002). It has been postulated that preferences for green spaces is a complex matter if people from different races or ethnicity are being compared (Byrne, 2012). Culture, race and ethnicity have also been associated with influencing green space use in that social action and interaction among people from different cultural, racial and ethnic groups may prefer to interact within their groups rather than across groups (Peters *et al.,* 2010; Sreetheran & van den Bosch, 2014). Consequently, this limits visits if one green space is mostly visited by people from either group.

1.6 Urban green spaces in South Africa

South Africa was under apartheid governance from the period between 1948-1994. This period was marked by racial segregation, with the government at that time favouring White supremacy (Wilkinson, 1998; Goebel, 2007). The apartheid era restricted free movement of black people from rural areas to urban areas for several decades (Wilkinson, 1998; Shackleton *et al.,* 2014). The 'black' people who came to the urban areas for employment via the pass system were restricted to staying in racially defined suburbs, locally termed townships (a term that endures) (Wilkinson, 1998). Townships were (and still are) generally poorly serviced, with a high

proportion of informal structures, backyard dwellers, few recreational green spaces or aesthetic features like street trees and other plantings, and widespread poverty (McConnachie *et al.,* 2008; McConnachie & Shackleton, 2010; Shackleton *et al.,* 2014). In contrast, "white" (referring to the English and Afrikaans speaking people) South Africans resided in well laid out, low density, leafy suburbs which were well maintained with adequate infrastructure (Beall *et al.,* 2000; Shackleton *et al.,* 2015). The legacy of racial segregation in South Africa has created highly uneven urban landscapes that continue to persist today and tend to be reinforcing (Hendler, 2015).

With the lead up to and after the South African democratic transition (just prior to and post 1994), the African National Congress (ANC) as part of its 1994 election manifesto advocated policies to alter the face of most urban landscapes (Shackleton *et al.,* 2014; 2015). Post-1994 saw the launch of the Housing White Paper detailing the rights of all citizens to adequate housing. The White paper highlighted the need to prioritise the poor and undertake an integrated housing process that was inclusive to all (Massey, 2013). To this end, there was the establishment of the Reconstruction and Development Programme (RDP) which sought to address the housing challenges among other things. A national housing programme which received the common term RDP houses sought to address the racially defined and those who experienced backlogs of service provision and housing created during apartheid (Wilkinson, 1998).

This programme aimed to deliver large numbers of houses for the indigent and those homeless at no cost for the most people (Gilbert, 2004), resulting in an almost one-track focus on providing "a roof over people's heads" rather than sustainable urban living (Shackleton *et al.,* 2015: p77). The RDP houses were generally developed in newly established townships in towns and cities. Previously disadvantaged households who meet the qualifying criteria (<R3 400 monthly household income, beneficiary must have dependant(s), no prior ownership of property, etc.) mostly from informal settlements received the fully-subsidized houses (at no cost) from the state. The building of these houses mostly on single storey, on a 40 m^2 foundation with a small plot, departs from the initial vision of the programme which sought to provide urban settlements which are liveable, free of racial and gender discrimination and segregation, enabling people to make residential and employment choices to pursue their ideals. Furthermore, to date, these high density settlements which are often termed 'RDP areas', have been seen to suffer from multiple structural defects (Huchzermeyer, 2001) with some people expressing gratitude for the new houses but many reporting lack of good-neighborliness and

community spirit in their new locations (Williams-Bruinders, 2013). According to McConnachie *et al.* (2008) and Shackleton *et al.* (2015) these housing settlements follow the same pattern of 'township' development during the apartheid era, generally lacking planning and attention to recreational green spaces and visually appealing elements.

The planning for the townships and RDP areas is described as lacking an integrated vision, and hence they are designed simply as areas where people will stay, i.e. a house, but not a home (Williams-Bruinders, 2013). These 'townships' are characterised by little or no, recreational space, commercial and economic hubs, and, in terms of this study, green spaces and features therein (Shackleton & Blair, 2013). For instance, 80 % of residents in two small towns of the Eastern Cape, felt that the available public green spaces lacked cleaning and that the municipality does not maintain the places (Shackleton & Blair, 2013). In addition, only 13 % of respondents staying in townships answered positively to whether there were approximately equal public green spaces across their towns. According to McConnachie & Shackleton (2010) considering nine towns of the Eastern Cape, the township areas and RDP sites had 18.9 m^2 of public green space per capita which is below national standards of 40 m^2 per capita. In addition, Kuruneri-Chitepo & Shackleton (2011) in three towns in South Africa, the township and RDP areas contained less than 5% of the street trees. The absence or limited green spaces, trees and other various features within local green spaces is felt by local residents, thus, negative sentiments being felt towards some urban green spaces (Shackleton & Blair, 2013; Shackleton *et al.,* 2015).

Despite the limited amount of urban green spaces in RDP areas and townships in the Eastern Cape, South Africa, there is growing evidence of the various roles that urban green spaces play in the livelihoods of people (Cilliers *et al.,* 2012; Kaoma & Shackleton, 2014; Shackleton *et al.,* 2016). For instance, in nine towns in the Eastern Cape, 64 % of people who live in townships used at least one wild natural resource, the origin of the of the resource was either collected from urban green spaces or purchased (Shackleton *et al.,* 2016). Findings of this study further pointed to that, on average, the prevalence of use of wild natural resources was lowest (29 % of households) in RDP areas and highest (82 %) in the townships. Cocks (2006) identified the widespread use of wild plants and medicinal plants among the Xhosa-speaking township dwellers in the Eastern Cape. In addition, work carried out amongst urban dwellers in small urban towns of the Eastern Cape has revealed that natural spaces on the municipal commonages offer places of cultural, spiritual and restorative importance to Xhosa-speaking township dwellers (Cocks *et al.,* 2016).

Cocks *et al.* (2016) assert that the ability of the Xhosa-speaking township dwellers to access and move through natural spaces within municipal commonages contributes to the people's well-being, identity formation and shared heritage. Sirayi (2008) and La Rosa *et al.* (2009) have identified that an ideal living environment for most urban dwellers should be the one that incorporates various cultures and traditions into urban planning. Cultural planning can be described as the planning that looks at history, sense of place, community relationships, identity and common memories (Saco *et al.,* 2009). According to La Rosa *et al.* (2009) an urban environment that represents the communities' culture plays a major role in community development and forms a positive relationship between developers and communities. In addition, Sirayi (2008) states that cultural planning helps municipalities to address racism, social exclusion, xenophobia and cultural identity. Since, the various features of urban green spaces are important to the well-being and quality of life for most poor, black dwellers living in the RDP areas and townships of South Africa (La Rosa *et al.,* 2009; Cilliers *et al.,* 2012; Cocks *et al.,* 2016), urban planning should incorporate these elements to reflect the cultural heritage, place making and identity of its inhabitants.

1.7 Research motivation

The majority of studies regarding the benefits accruing from human-nature interactions, the composition of urban green spaces, and perceptions and attitudes towards features within urban green spaces have been conducted in developed countries. In the Global North, urban green spaces have received much attention as a way of improving the living conditions and quality of life in urban areas (Chiesura, 2004; Fuller *et al.,* 2007; Madureira *et al.,* 2018). It is without doubt that urban green spaces with various features (trees, grass, herbs, shrubs, benches, play equipment, sports facilities) within towns and cities of the Global North serve important cultural, social, psychological and ecological functions (Ulrich, 1984; Peters *et al.,* 2010; Keniger *et al.,* 2013; Shanahan *et al.,* 2015). In this regard, urban green spaces are seen as places for relaxing, recreation and reflecting and usually people visit them to 'escape from the city'; 'feel better' and 'revive themselves' (Chiesura, 2004: p136; Özgüner, 2011: p613; Palliwoda *et al.,* 2017).

In Sub-Saharan Africa, only a few studies have been conducted on human-nature interactions in urban areas, and most of these emanate from South Africa (Davenport, 2011; 2012; Shackleton & Blair, 2013; Cocks *et al.,* 2016, Adegun, 2018). The majority of the studies done in South Africa, specifically in the Eastern Cape province, have focused on benefits and

perceptions of street trees (Kuruneri-Chitepo & Shackleton, 2011, Gwedla & Shackleton 2017; Shackleton & Gwedla, 2017), uses and users of municipal commonage (Davenport, 2011; 2012); the uses of plants for traditional and cultural purposes (Cocks, 2006; Cocks *et al.,* 2016) with no studies paying specific attention to the specific features of formal and informal green spaces and municipal commonages. Various works have also looked at the perceptions of the public urban green spaces (Shackleton & Blair, 2013), the inequality in the distribution of public green spaces (McConnachie *et al.,* 2008, McConnachie & Shackleton, 2010) and the importance of urban green spaces (Shackleton *et al.,* 2016). Consequently, there is only limited understanding on the composition and attributes of the available urban green spaces and perceptions and attitudes towards features within the green spaces.

Furthermore, this study will help interrogate the findings from previous studies which have mainly been carried out in the Global North in different contexts which do not reflect the settings of the poor, black and marginalised people staying in the RDP areas and township areas of South Africa. Moreover, most previous work in South Africa and globally, has looked at formal green spaces like parks and botanical gardens, with relatively few studies looking at both formal and informal green spaces simultaneously, e.g. Graça *et al.* (2018). This study adds a further type of green space (see Section 1.3.1), that is, municipal commonages which is context specific to South Africa, Malawi, Tanzania and Zimbabwe and other developing countries. This is despite increasing knowledge on the potential of municipal commonages in improving the quality of life and well-being of urban dwellers (Ingle, 2006; Davenport, 2011; 2012).

It is becoming clear that there has been limited research on different types of green spaces and features within them in low-income areas of many developing countries. Thus, the aim of this study was to investigate the composition and quality of features within urban green spaces and examine the perceptions and attitudes towards available features in South African urban green spaces, particularly in the low-income areas where most of the poor, black and marginalized communities stay. The understanding of such realities will go a long way in making towns and cities of South Africa reflect people's needs and preferences in the design of urban green spaces around them, thus contributing to a better quality of life and well-being for these urban dwellers.

1.8 Aim and objectives

1.8.1 Aim

The aim of this study was to investigate the composition and quality of features within urban green spaces and examine the perceptions of and attitudes towards available features within urban green spaces in the low-income areas of South Africa.

1.8.2 Objectives and key questions

1. To evaluate the quality of features within urban green spaces, construct a user profile, and understand motives for visiting urban green spaces

1.1 What are the main features which make up urban green spaces?

1.2 What is the quality of such features within urban green spaces?

1.3 What are the main demographics and socio-economic characteristics of users of different urban green spaces?

1.4 Why do users visit urban green spaces?

2 To explore user attitudes and preferences towards features within urban green spaces

2.1 What features are identified as important and or necessary within different urban green spaces?

2.2 What sentiments are expressed towards different features contained within urban green spaces?

2.3 What features and characteristics do users prefer or dislike in urban green spaces?

2.4 What is the most preferred design/type of urban green space?

1.9 Structure of thesis

This thesis is composed of five chapters: ***Chapter 1*** (this chapter) introduces human-nature interactions and the use of outdoor areas, such as urban green spaces, to relax and recreate, in addition, the broader theoretical and conceptual context of the study, including a literature review of relevant research trends and perspectives are presented. ***Chapter 2*** contextualises the study by providing a description of the two study areas (King Williams Town and Queenstown). In this chapter, I also provide a closer look at the social-economic and biophysical context of the two study sites. It is also in this chapter that I outline the research design and methodological approaches used.

The two subsequent chapters (***Chapters 3*** *and* ***4***) present the research findings of this study. ***Chapter 3*** explores the attributes and composition of the sampled urban green spaces and reasons why people visit them. In ***Chapter 4***, the attitudes and preferences for features within urban green spaces are presented. The concluding chapter, ***Chapter 5***, provides an overarching synthesis of the thesis, integrating key themes that emerge from all the foregoing chapters. It is in this chapter that the practical implications of the study findings and key learnings are discussed.

CHAPTER 2

STUDY CONTEXT, MATERIALS AND METHODS

2.1 Chapter overview

This chapter first describes the general context of the Eastern Cape (EC) province where the two study towns are situated along with the main geographical location, socio-economic conditions, biophysical conditions and challenges faced by the EC province. It then describes the socio-economic, demographics and geographical location of the two study towns. A combination of methods that drew mainly on quantitative data sources as well as secondary information were applied in this study and the sampling techniques and methods are described in detail. Finally, ethical considerations which were put in place for this study are reflected upon.

2.2 The Eastern Cape province

2.2.1 Location

The Eastern Cape (EC) province is the second largest province in South Africa by land size (StatsSA, 2016) and is situated in the south-eastern seaboard of South Africa (Hamann & Tuinder, 2012). It borders Lesotho to the northeast and shares boundaries with four neighbouring provinces (DEAT, 2004; Hamann & Tuinder, 2012) (Figure 2.1). Within the Eastern Cape, there are six district municipalities (Alfred Nzo, Amatole, Chris Hani, Joe Gqabi, O.R. Thambo and Sarah Baartman) and two metropolitans, i.e. Nelson Mandela Bay and Buffalo City (DEAT, 2004). The western half of the province is more developed compared to the former homelands within the eastern half dominated by poverty-stricken villages and small towns (Bank & Minkley, 2005; Hamann & Tuinder, 2012).

2.2.2 Socio-economic context

The EC province has the third largest population in South Africa (6.2 million) of which approximately 38 % is urban (ECPC, 2014; StatsSA, 2016). The EC province has the second highest poverty levels in the country by measures such as the high proportion of unemployed young people, low literacy rate, low levels of employment and 47 % of the population living below the poverty line (ECSECC, 2009; ECPC, 2014). This is coupled by a high

unemployment rate of 27 % (StatsSA, 2010), with many people living without basic infrastructure and services (CSIR, 2004). Crop production, livestock, agro-based industries, migrant labour and eco-tourism are among the main sources of income (DEAT, 2004). In addition, social grants in the form of old age grants, disability grants, foster and child grants play a pivotal role in supporting livelihoods (DRDLR, 2013). The demographics of the former homelands largely consist of women (52 %) and children, which reflects high levels of male migration to more industrialised areas seeking employment opportunities (ECSECC, 2009; ECPC, 2014). Most of the population is black African (88 %), with coloured, whites and Indian/Asian groups making up 12 %. English is the main language of formal communication, with IsiXhosa being the dominant home language spoken (StatsSA, 2011).

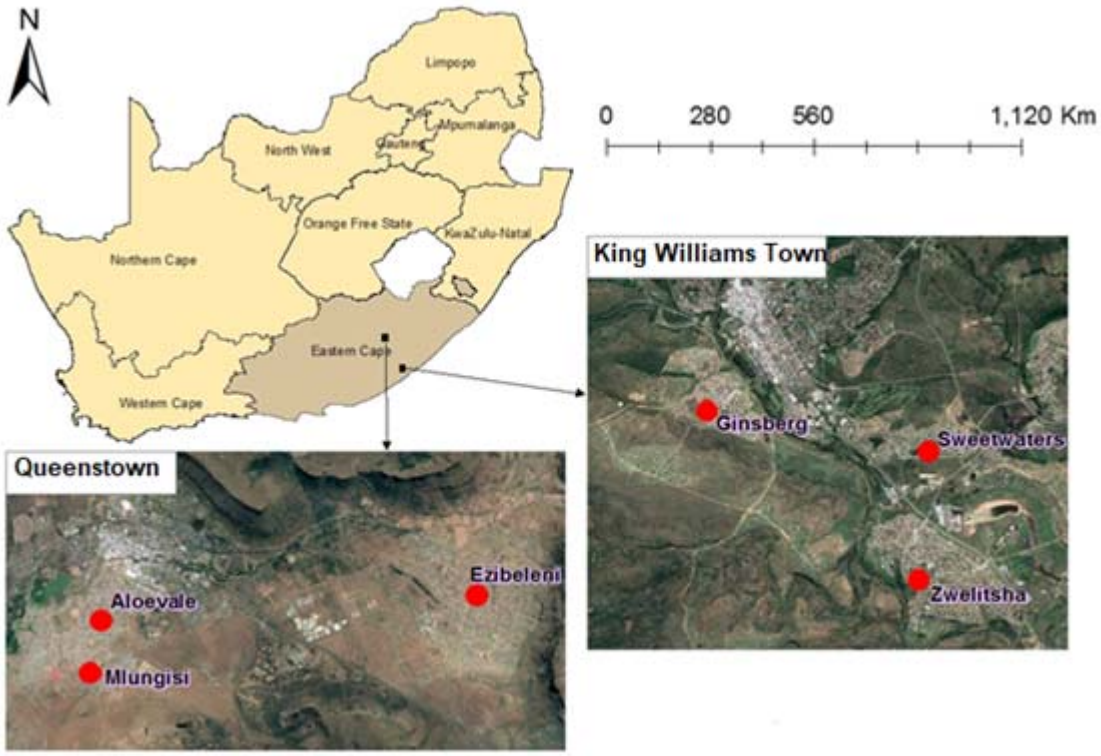

Figure 2.1. Location of the Eastern Cape within South Africa and locations of suburbs sampled in each of the two study towns: (a) Queenstown: 1-Mlungisi, 2-Ezibeleni, 3-Aloevale; (b) King Williams Town: 1-Ginsberg, 2-Sweetwaters, 3-Zwelitsha

2.2.3 Climate

The EC lies in the transitional zone between the Mediterranean-type winter rainfall region to the west and the subtropical summer rainfall in the east, hence it experiences the bimodal rainfall pattern (Joyce, 2008; ECPC, 2014). Rain producing systems include orographic forcing, frontal activity, convective action and tropical storms (Joyce, 2008). Mean annual

rainfall varies considerably across the EC, from 300 mm per annum in the west to 1 000 mm per annum in the east (Joyce, 2008). Air temperatures also vary with hot summers towards the northeast, and very hot but long days in the Karoo (Joyce, 2008). The northeastern interior of the province experiences cold and clear days in winter but become hotter and drier towards the western parts during summer (Joyce, 2008). Humidity gradually increases along the northern parts of the coast while, heavy snowfalls have been recorded in the mountainous regions (DEAT, 2004; Joyce, 2008). Predictions have highlighted that the EC will be one of the most affected areas by climate variability and climate change in South Africa (DEA, 2010).

2.2.4 Flora

The EC province is the only South African province with seven of the eight South African biomes and comprises 28 vegetation types (Mucina & Rutherford, 2006). The grassland biome is the largest biome in the EC covering at least 40 % of the province (Mucina & Rutherford, 2006) (Table 2.1) .

Table 2.1. The seven biomes of the Eastern Cape (source: Mucina & Rutherford, 2006)

Biome	***Area (%)***
Albany Thicket	26.2
Forest	0.9
Fynbos	6.8
Grassland	41.8
Indian Ocean Coastal Belt	1.6
Nama Karoo	19.5
Succulent Karoo	2.2
Savanna	1.0

The province contains five centers of endemism, the largest being the Albany Thicket, which spans at least nine million hectares across the province (van Wyk and Smith, 2001). The Albany Thicket biome comprises thorny, spinescent, often succulent bush known as Subtropical Thicket. Mucina & Rutherford (2006) postulated that 51 % of the Albany Thicket is under constant threats from goat and sheep farming because of over grazing, thus at least 316 plant species are threatened (Victor & Dold, 2003). At least six plant species are believed to be already extinct within the province (Victor & Dold, 2003). Within the province there is also a relatively high abundance and distribution of alien plants with species like *Acacia cyclops*, *A.*

mearnsii and *A. dealbata* replacing the indigenous vegetation (Hamann & Tuinder, 2012; ECPC, 2014). However, there is lack of reliable data from the province to conclude on the extent of invasiveness and impacts on naturally occurring flora (Gibson & Low, 2003; Mucina & Rutherford, 2006).

2.3 The two study towns: Queenstown and King Williams Town

Within South Africa, small to medium-sized towns have received less scholarly attention in comparison to larger cities (Atkinson, 2008; Hoogendoorn & Visser, 2016). The two study towns were selected purposefully for being small towns according to Atkinson (2008). Both towns have large townships and Reconstruction Development Program (RDP) neighbourhoods, which are occupied mostly by poor, black urban dwellers. In addition, both towns have similar political and cultural histories relating to apartheid, therefore having comparable socio-economic backgrounds. In comparison, King Williams Town has a high population annual growth rate (2.18 %) than Queenstown (1.77 %) (Table 2.2).

Table 2.2. Population growth of the two study towns (source: City Populations Database, 2016)

Town	District Municipality	Census 2001	Census 2011	Population Growth	Annual Growth Rate (%)
Queenstown	Chris Hani	84 092	98 988	14 896	1.77
King Williams Town	Buffalo City	63 774	77 682	13 908	2.18

2.3.1 Queenstown

Queenstown (31°54’0’S, 26° 53’0’E) was founded in 1853 as a defensive stronghold for the early colonial settlers and is currently the main commercial and administrative town for the surrounding farming areas (Clarke, 2012). It is a popular destination for rural-urban migration flows, especially since the national political transition in 1994 (Fröden, 2009). It is also the seat of the Chris Hani District. The national census in 2011 estimated the population to be 98 988 (City Population Database, 2016). The population density is high with 1 389 people per square kilometre with an annual growth rate of 1.77 % (Table 2.2). The town has more females (52.8 %) than males (47.2 %). The greatest proportion of the population are black Africans (72.3 %), with the majority of the people speaking isiXhosa (64.1 %). With regards to literacy, the Chris

Hani district has 69.3 % of the population described as functionally literate (Chris Hani IDP, 2017).

The main economic activities in Queenstown and the district are generally centred around government services, agriculture and agro-processing, mining, manufacturing, tourism and heritage and wholesale and retail sector (Chris Hani IDP, 2017). The formal labour market of Queenstown has not been able to absorb the increasing population, which has resulted in 41 % of the population being unemployed (Fröden, 2009). Human Development Index (HDI) is composed of life expectancy, education level and per capita income. According to the Chris Hani District IDP 2017/2022 the HDI in the district is 0.556. Moreover, the percentage of people living in poverty is 55.1 %. Like all South African towns, Queenstown is heavily racially segregated with the former white areas lying to the north, east and west of the town while in the south lie the densely populated and poorer Mlungisi and Aloevale townships (Figure 2.1) (Clarke, 2012). Ten kilometres away from the city centre is the township of Ezibeleni where black families were forced to live during apartheid. It is characterised by less productive land and underdevelopment (Fröden, 2009).

Queenstown lies within the Albany Thicket and Grassland biomes (Table 2.1), which is the dominant vegetation type found on municipal commonages which surround the town (Hoare *et al.,* 2006). The average rainfall is 399 mm per year, with most occurring mainly during summer. The average midday temperatures for Queenstown range from 16.8°C in June to 27.6°C in January. The region is the coldest during July, dropping to 2°C on average during the night. Queenstown stands at 1 075 m above sea level. According to Radebe (2018) the urban core of (i.e. excluding commonages, woodlands//thicket and farms on the periphery of the town) is made up of 27.2 % of green space, furthermore, the dominant type of green space type is private gardens (9.0 %), followed by institutional green space (4.8 %), sport areas (3.7 %) and waste lands (2.2 %). Public green spaces like street trees (1.8 %) public parks (1.7 %), cemeteries (1.7 %), riparian areas (0.9 %), informal spaces (0.8 %), road verges (0.4 %) and church yards (0.2 %) contribute to the least coverage of green spaces in the town. Furthermore, the coverage of green space was lowest in RDP areas (0.9 %) in comparison with the township (24.9 %) and affluent areas (74.2 %).

2.3.2 King Williams Town

King Williams Town (32°53’0’S, 27° 24’0’E) is a small town in the Buffalo City Metropolitan Municipality, established in 1835. It was founded as a settling ground for the white settlers

during the Xhosa Wars (Bank, 2010). It is the second most populous town within the Buffalo City Municipality district, with a population of 77 682 (StatsSA, 2011). There are more females (53.8 %) than males (46.1 %) in the town. The black African population group (65.3 %) make up the bulk of the population whilst the majority of the population (53.8 %) speak isiXhosa (StatsSA, 2011). The town's economic activity depends on agriculture, agro-processing and serving as a local economic hub for the surrounding small towns (Zituta, 1997). Its proximity to the provincial capital of Bisho has brought much infrastructural development in the town within the last two decades (Zitatu, 1997). King Williams Town hosts townships such as Zwelitsha, Ginsberg and Sweetwaters (Figure 2.1) (Cindi, 2015). It is estimated that over 45 % of the population are unemployed (Cindi, 2015) and consequently the poverty ratio is high. Some of those employed travel daily to and from Mdantsane and East London (Haynes, 2017).

King Williams Town lies within the Albany Thicket Biome of the Eastern Cape (Table 2.1), which is the dominant vegetation type found on municipal commonage around the town (Hoare *et al.,* 2006). The town receives about 502 mm of rain per year, with most occurring during summer. It receives the lowest rainfall (8 mm) in July and the highest (74 mm) in March. The average midday temperatures for King Williams Town range from 19.7°C in July to 26.7°C in February. King Williams Town stands at 398 m above sea level. The percentage cover of green spaces in the urban core of King Williams Town is 57 % (excluding municipal commonages, and farms on the periphery of the town) (Radebe, 2018). The dominant type of green space within the town is domestic (18.3 %) followed by wastelands (17.1 %). In similar fashion, King Williams Town like Queenstown has limited amounts of public green space, informal space (1.2 %), public parks (0.2 %) and road verges (1.5 %). Furthermore, the coverage of green space was lowest in RDP areas (7.6 %) in comparison with the township (57.6 %) and affluent areas (34.8 %).

2.4 Research design

Exploring human-nature interactions often poses methodological and analytical problems that are difficult to solve using familiar scientific procedures (Turner *et al.,* 2003). For complex human-nature studies, using only one data source is often inadequate, providing only partial understanding of the research problem. Thus, a combination of methods are required to gain an in-depth understanding of complex factors interacting within social-ecological systems (O'Brien, 2012). In addition, intertwined methods result in a more complete understanding of the research problem than either approach alone (Creswell & Clark, 2007). The main methods

selected for the purposes of this research are baseline assessments, structured observations of features within public urban green spaces and household survey with a semi-structured questionnaire. This intertwining of methods was useful in providing a comprehensive understanding of how urban dwellers identify with various features within urban green spaces. Methods used in this study are mostly of a quantitative nature to give statistical rigour to the research (Newing, 2010).

Data were collected over a five-month period between July and November 2017, with a baseline study having been conducted in March 2017 and also a pilot study in June 2017. An initial meeting with some representatives of all townships was conducted prior to data collection, which established the social and cultural boundaries within which this research was conducted, as well as to familiarize community members with the purposes and proposed activities of the research.

2.5 Research methods

2.5.1 Baseline assessments

The research project commenced with an inventory of the features of urban green spaces of the two selected study towns, after which structured observations took place in selected green spaces (see Section 2.5.2). Google Earth images of King Williams Town and Queenstown were used to identify and locate residential areas. These residential areas were mapped into one of three categories, viz.: affluent residential, township and RDP suburbs as done by Shackleton & Blair (2013). The major townships and RDP areas were purposively selected because they house the highest populations of black South Africans, high unemployment levels, high poverty ratio and the lowest Human Development Index (HDI) (see section 1.6, 2.3.1, 2.3.2). Google Earth images were then used to identify all the green spaces in the township and RDP areas, totalling 33 in Queenstown and 41 in King Williams Town.

A ground-truthing exercise was then done after which all green spaces were categorized as formal, informal or municipal commonage (see Section 1.3.1). Within each of these spaces, direct observations were made. The total size of the space was estimated, and this was followed by inventorying all the observable features in the spaces, the number of people present at each space and activities in which they were partaking. The results of the baseline study were used to generate a checklist and questionnaire (see Appendix 1 and 2) and choose green spaces for further assessment and evaluation (see Section 2.5.2).

2.5.2 Structured observations

Within each town 24 green spaces were chosen from the sample drawn in the baseline study. These green spaces were chosen based on size (0.2 ha to 0.3 ha) and proximity to households. The formal and informal green spaces chosen were assessed as a whole, whilst for commonages plots were sampled because of their large size. Thus, 12 plots of 40 m × 20 m were randomly marked in commonages and then assessed as per the checklist in both towns on a scale from zero to five. A score of zero represented absence of a feature, whilst a score of 1 represented poor quality of available feature, a score of five represented the best quality of a feature. A predetermined checklist (Appendix 1) based on evidence collected or generated during the baseline assessment (see Section 2.5.1) was used. Observations were done on-site, with the researcher critically evaluating each space. The time spent assessing each plot was influenced by weather and accessibility of the green space. The observations started at 0800hrs up to 1800hrs each day. The morning observations were between 0800hrs to 1200hrs midday, afternoons were from 1201hrs midday to 1500hrs whilst late afternoons were from 1501hrs to 1800hrs. Within each space, the researcher spent 30-45minutes in the morning, afternoon and late afternoon thus, each space being observed for at least two hours per day. Each green space was visited at least 3 days during the entire study. This process was repeated until all green spaces were assessed and evaluated. The time spent observing was also dependent on size and features within the green spaces. This approach facilitated for observations to be done daily and cover all times of the day. This exercise was done for 27 days in both towns. The checklist was divided into the following four sections:

Section A recorded the occurrence of different vegetation forms (e.g. lawn, herbs, shrubs) and then the quality of the vegetation was scored by considering the amount of invasive or alien species as opposed to indigenous species, whether trees were cut or damaged, presence of diseased plants and or other factors (see Appendix 1 for detailed criteria).

Section B focused on the general maintenance of the spaces. The presence of rubbish bins and any signs of people making use of them were recorded. Maintenance of the area was assessed by observing the extent of littler found, broken equipment, decaying infrastructure including leaking ablution facilities, maintained flower beds and mowing of lawns.

Section C covered the presence and absence of recreational amenities. The absence or presence of recreational amenities (e.g. swings and play equipment, seats, shelter) was recorded within

the space. The quality of these features was assessed by determining the extent of vandalism and damage of the equipment. Evidence of maintenance was also recorded.

Section D was related to the safety and security of the space. The presence or absence of security features like gates, fences, security guards, surveillance and lighting were noted. The quality was based on the type of enclosure available in that it was full or partial, also anti-social behaviour such as loud music, drinking of alcohol, and rowdy behaviour within the space was noted.

2.5.3 Household survey

Within each of the two towns nine green spaces were randomly chosen from the sample previously drawn for the assessment and evaluation stage of the project (see Section 2.5.1). Aerial photographs (scale 1: 5 000) were used to identify the households located nearest to the selected green space, within three suburbs in each town (RDP and township areas). Using a grid overlay in each of the three suburbs per town, 20 households were selected around the randomly selected green space type, thus (60 households per suburb and 180 households per town). Interviews were limited to one member of each household and who were willing and over the age of 18 years at the time of the study. In the event that two or more members (18 years and above) of the household were willing and present, random numbers were assigned to each member and a random draw was done to select the member to be interviewed. After a successful pilot study of 16 households in Grahamstown it was relatively easy to locate and conduct the questionnaires in the study area. Interviews were conducted in isiXhosa or English and lasted for an average of 45-60 minutes. Face to face interviews were carried out and provided opportunities for respondents to ask questions if they did not understand the questions being asked. It also provided opportunity for follow up questions and in some instances prompted a wider conversation about green spaces and life in that area. To include people who worked the questionnaire was administered at different times of the day and different days of the week including weekends. See Appendix 2 for a detailed survey household questionnaire. Some households declined to participate or were not at home and so the researcher moved to the next household on the sample frame.

In order to understand the type of green space respondents will rather visit they were presented with four images which represented the types of green spaces available around their homes (Appendix. These images were captured during the baseline study and upon discussion with

other peers within the discourse of urban forestry, it was agreed that the four were representative of the types of spaces you would typically find in the low-income areas of South Africa. The respondents were presented with the images and they took time in going through the four images and stating what they liked and preferred in each (Table 4.5). The main image to be chosen was stated and recorded. The questionnaire was divided into four sections:

Section A recorded the visiting profile and behaviour of green space users. It encompassed questions pertaining to whether the respondent visits the green space adjacent to their home or not. For those who indicated that they visited the green spaces, the time taken to reach the green space, frequency and purpose of visiting the green space, time and day of visiting were asked.

Section B focused on the green space features that the respondents saw when in the green space, and to understand the attitudes towards those features. How they affect the way they view the space and their day to day living (respondents could give as many attitudes as they wished towards each feature, there were no predetermined categories).

Section C covered the major activities undertaken in green space, and this section further explored why some respondents choose not to do certain activities within the green space. These activities were noted and recorded during the baseline study and later grouped to come up with an exhaustive list.

Section D was related to the main barriers or features within the green space that deter the respondent. In addition, respondents were asked how these shortcomings could be rectified and if they could offer any suggestions to the responsible authority in this regard.

2.6 Data analysis

Data collected from the structured observations were mostly quantitative data. Microsoft Excel (2010) was used to manage and analyse the data derived from the evaluation study. The data were disaggregated by the type of green space as well as by the type of feature. Frequency counts, mean percentages, and mean scores were presented in a number of graphs and tables. Differences among the vegetation types (herbs, shrubs, trees and lawn) were tested with Kruskal-Wallis H-test and further a Mann-Whitney U test to show differences between different green space types. These tests were done because the variables did not meet the appropriate assumptions (e.g. normality and homogeneity of variance) for an ANOVA to be used. SPSS 21 for Windows (SPSS Inc., 2007, Chicago, Illinois) was used.

For the household survey, preliminary data analyses (descriptive statistics) were conducted using Microsoft Excel (2010). The demographics of the study population were organised into frequency counts and tables. Before any statistical tests were done, normality tests were conducted using the Shapiro-Wilk test. To test for the effect of green space type on motives for visiting green spaces and deterring features for users, a Chi square (χ^2) analysis was completed. Furthermore, a Pearson Chi square (χ^2) was performed to test for any association between observed feature, preferred features and, green space type, age, gender, education as well as employment status and household income.

Because many variables were collected to depict observed and preferred features within green spaces, a principal component analysis (PCA) was carried out to reduce the variables to the most important ones. PCA is a vector space transformation, which assists in the identification of patterns within high-dimensional data, thereby revealing the main factors as principal components (PCs) (Smilauer & Leps, 2014). Through the identification of clustering of variables that measure the same theme, variations with the data are optimally described. Varimax rotation was used to maximise the variance of loadings thereby aiding the classification of variables to PCs. This data reduction method results in zero correlations between the PCs.

Detrended canonical correspondence analysis (DCCA) was employed to determine whether linear or unimodal analysis methods should be employed (Smilauer & Leps, 2014). The gradient lengths from the DCCA output were examined, and since the longest gradient was less than three a linear redundancy analysis (RDA) model was selected (Smilauer & Leps, 2014) to study urban dweller's attitudes in relation to the features within different types of green spaces. Redundancy analysis is a constrained ordination method which can be thought of as an extension of multiple regressions to the modelling of multivariate response data (Smilauer & Leps, 2014). The study employed a preliminary RDA to remove correlated variables (indicated by variance inflation factors above 20) using the entire environmental variables data set. Stepwise manual forward selection with Monte Carlo test with 999 permutations was then employed to identify a minimal subset of features within green spaces that were significantly related to the various attitudes. PCA and RDA were performed using CANOCO version 5 (Smilauer & Leps, 2014). All other statistical tests were performed in SPSS 21 for Windows (SPSS Inc., 2007, Chicago, Illinois).

2.7 Enhancing the validity and reliability of data

Collection of data comes with problems associated with questioning data accuracy (Newing, 2010). Data are considered to be reliable if they are without bias (Lawton, 2003) and, importantly, if they are consistent (Laxton, 2004). Reliability is thus improved if sampling bias and sampling error are minimized. It should be noted that while reliability contributes to data integrity, it does not necessarily always lead to accuracy (Guler, 2004) and validity. Data may be very precise and consistently reflecting a firm response, but may be wrong, perhaps because the data-gathering tool has been inaccurately designed (Guler, 2004). To enhance the reliability of the data collected, a large sample size was chosen, namely 360 completed questionnaires; the researcher ensured that the questionnaire was piloted, worded and organized in a manner that could be easily understood and interpreted for data analysis (Fowler, 2002; Babbie, 2011). Great care was taken in safeguarding the accurate recording and retention of all data collected for analysis (Gomez & Jones, 2010). It was made clear to the respondents that the research is purely for academic purposes and therefore no incentives were used to engage respondents. Finally, the researcher adhered to a work plan for the research to ensure good implementation of the project and limit errors in the research (Gomez & Jones, 2010). The validity of the current study was enhanced by making sure that study participants understood the purpose of the study; consciously attempting to minimize bias by random selection of respondents and improving the questionnaire's content validity, or the ability of the research instrument to comprehensively assess the area it purports to investigate (Guler, 2004).

2.8 Ethical considerations

All research was designed and conducted in accordance with Rhodes University Ethical Standards Committee (RUESC) guidelines, with particular reference to involving human participants. As stipulated by the ethical requirements, all respondents were informed of their rights before participating in this research. Respondents were informed of the nature and purpose of the study and were told that it was part of the researcher's MSc degree. All participation in this research was voluntary and no individual was forced into participating. Where individuals agreed to participate in the research, written or verbal consent was given. The identities of the participants were kept anonymous and the information collected has not been shared with parties outside of the broader research project. To avoid raising any expectations, it was made very clear to the respondents that the study was purely for educative purposes and that there was no incentive for participating in the study. This was explained when the consent form was signed by the respondent and also said when being welcomed into

the household. Safety of the research participants was also taken into consideration as all interviews were done during the day and in open areas.

CHAPTER 3

URBAN GREEN SPACE ATTRIBUTES AND REASONS FOR VISITING

3.1 Chapter overview

This chapter is the first of two empirical chapters; it focuses on assessing the composition and quality of both artificial and natural features within urban green spaces (formal, informal and municipal commonages) in Queenstown and King Williams Town in the Eastern Cape, South Africa. The chapter is built on the rationale that to understand the attitudes and preferences towards green space attributes, it is important to understand the attributes present and evaluate their quality. The results and discussion within this chapter are based upon the first objective (see Chapter 1, Section 1.8.2), namely, to evaluate the quality of green space attributes and understand reasons for visiting. The following research questions were addressed as part of this:

- What are the main features which make up urban green spaces?
- What is the quality of such features within urban green spaces?
- What are the main demographics and socio-economic characteristics of users of different urban green spaces?
- Why do users visit urban green spaces?

3.2 Introduction

Within urban settings, different types of urban green spaces enhance the liveability of cities by providing a range of ecosystem services and benefits to city dwellers (Kuo & Sullivan, 2001a; Chiesura, 2004; Fuller *et al.,* 2007; Lee & Maheswaran, 2011). Ecologically, urban green spaces provide innumerable benefits including air pollutant removal, sequestering carbon dioxide and amelioration of the urban heat island (Miller, 2005; Jim & Chen, 2006; Lee & Kim, 2015). At the individual level, urban green spaces can provide opportunities for inspiration, stress relief and well-being (Ulrich, 1984; Chiesura, 2004; Fuller *et al.,* 2007). At the family and community level, they provide spaces for social interaction and recreation (Kuo & Sullivan, 2001a; Özgüner, 2011; Shan, 2014). Across different cultures, urban green spaces cater for different needs and benefits to the users (Fuller *et al.,* 2007; Özgüner, 2011;

Shackleton *et al.,* 2015; Palliwoda *et al.,* 2017). A great deal of work has been done in highlighting the innumerable benefits from different types of urban green spaces (Keniger *et al.,* 2013; Rupprecht *et al.,* 2015; Shanahan *et al.,* 2015). However, at the intra-space scale the composition and quality of artificial and natural features which are building blocks of the different green space types have been little studied (Keniger *et al.,* 2013; Botzat *et al.,* 2016).

Most studies within the field of urban ecology have used the word 'nature' to collectively describe different components found within green spaces that offer various ecosystem services (Chiesura, 2004; Keniger *et al.,* 2013). However, it remains unclear which features contribute to various ecosystem services (Botzat *et al.,* 2016). According to Kremen (2005) it is therefore, critical to identify the 'service provisioning units' so as to effectively design and plan sustainable urban green spaces. In the Global North, some researchers have identified various features such as biodiversity in general, trees, herbaceous layers and water bodies as the components providing specifically significant benefits to people (Ulrich, 1984; Fuller *et al.,* 2007; Matsuoka & Kaplan, 2008; Palliwoda *et al.,* 2017). Within developing countries, most literature has focused on the various non-timber forest products, which are usually obtained in the urban green spaces or city outskirts (Ouinsavi *et al.,* 2005; Mensah, 2014). Whilst other literature has focused mostly on the availability of trees within and across towns (Kuruneri-Chitepo & Shackleton, 2011; Gwedla & Shackleton, 2015), it essentially ignores the other building blocks of green spaces as a unit of analysis, use and management and the benefits they supply.

There is also mounting empirical evidence which indicates that the presence of particular artificial features within urban green spaces increases the attractiveness and also diversifies the reasons for visiting urban green spaces (Özgüner, 2011; Zhang *et al.,* 2013 Bertram & Rehdanz, 2015). According to leisure research, urban green spaces offer diversified recreational opportunities that arise from the availability of various features like play equipment, tennis and basketball courts, seating and shelter (Gobster, 2002; Swanwick *et al.,* 2003; Özgüner, 2011). However, literature from developing countries, nor South Africa, has not covered the composition or the quality of artificial features within urban green spaces (Ahern *et al.,* 2014). The composition and attributes of different urban green spaces influence the various benefits people acquire from them, hence it is important to ensure the quality of features of all urban green spaces. Enhancing the quality of features within urban green spaces will potentially diversify the motives or reasons for people visit urban green spaces (Shan, 2014).

Motives or reasons denote the internal factors that arouse and give direction to human behaviour and they originate from the desire to achieve specific psychological or physical outcomes or benefits (Shan, 2014). The reasons city dwellers visit urban green spaces shows the needs and expectations of people (Chiesura, 2004) and exactly what they spend time doing within the spaces shows the extent of attachment to specific components within those spaces. Understanding the reasons for visiting urban green spaces is important in that it provides insights in how people view these spaces (Jim & Chen, 2006; Özgüner, 2011). A plethora of studies indicate motives to visit urban green spaces are context specific and differ with gender, age, race, ethnicity and context. For example, residents in Isparta, Turkey, usually visit green spaces for picnics and barbeques (Özgüner, 2011), whilst walking a dog, walking, bringing children and exercise were cited as the common reasons for visiting urban parks in Amsterdam, Netherlands (Gobster, 2002). Furthermore, in sub-Saharan Africa, specifically in South Africa, studies have identified the collection of plants, fruits and fuel wood (Davenport *et al.,* 2011; Kaoma & Shackleton, 2014), getting fresh air and appreciating natural beauty (Ward *et al.,* 2010) and sports and recreation (Shackleton & Blair, 2013) as major reasons for visiting urban green spaces. Hence, insights about reasons for visiting urban green spaces can assist decision-makers to influence the type of features required within different types of urban green spaces to meet the needs of the users.

Within the context of the above, this study therefore sought to investigate the composition and attributes of different types of urban green spaces and the degree to which they may influence the reasons for visiting. This was done by means of assessing the formal and informal green spaces and municipal commonages green spaces and a household survey administered in two towns in the Eastern Cape, South Africa.

3.3 Methods

The study employed qualitative and quantitative data collection techniques. Structured observations were the main tool used for data collection, complimented by pictures of the sites taken. To identify the existing features within the urban green spaces a field survey was performed using a checklist (Appendix 1). The data was described and analysed in Microsoft Excel and SPSS, respectively. The detailed methods are described fully in Chapter 2 of this thesis.

3.4 Results

3.4.1 Composition of the green spaces

Informal green spaces had the most bare ground (35.6 %) whilst formal spaces were dominated (62.7 %) by open lawns (Figure. 3.1). Flowerbeds were only present in the formal green spaces. The commonages were predominantly covered with a herbaceous layer (41.6 %), shrub layer (50.7 %) and trees (43.3 %). Mean percentage cover varied significantly across different groups of vegetation, lawn coverage (H=6.6; p=0.037) and shrubs coverage (H=6.8; p=0.033). Lawn cover varied significantly between formal and informal green spaces (z=2.58, p=0.009) and shrubs cover varied significantly between informal green space and municipal commonage (z=2.12, p=0.04). Overall, formal green spaces had relatively lower woody and non-woody plant coverage as compared to the informal green spaces and commonages.

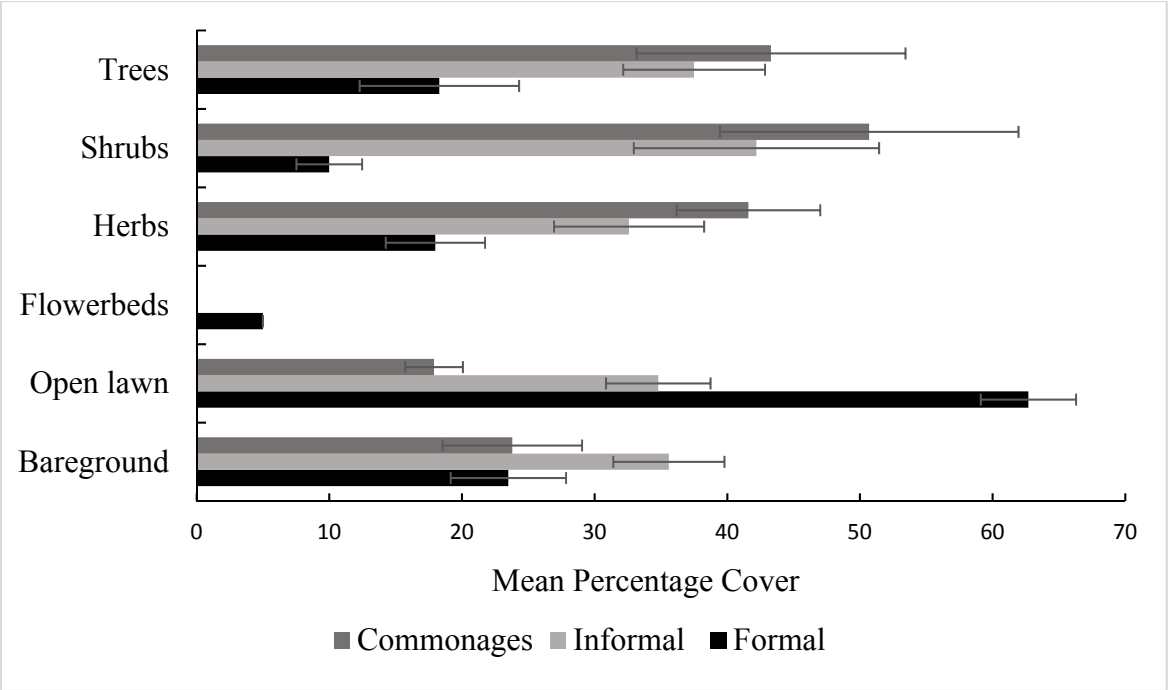

Figure 3.1. Mean percentage cover of classes within urban green spaces in two towns

Litter (waste, trash, plastics) coverage in the green spaces was high, ranking between 50 % in the commonages to 80 % in the formal green spaces (Figure 3.2). The litter within the spaces was either scattered about or clumped in piles at the edges of the spaces (Figure 3.2). There were also high levels of dereliction in the spaces. Approximately four-fifths (79.6 %) of the informal green spaces were covered with litter (Figure 3.3). The formal green spaces and commonages also had high litter cover with approximately three-fifths of the spaces containing

litter. The litter composition varied from plastic scattered around, bottles, paper and cardboard boxes (Figure 3.2).

Figure 3.2. Litter distribution within an informal green space in Mlungisi Township, Queenstown (Photo by Current Masunungure)

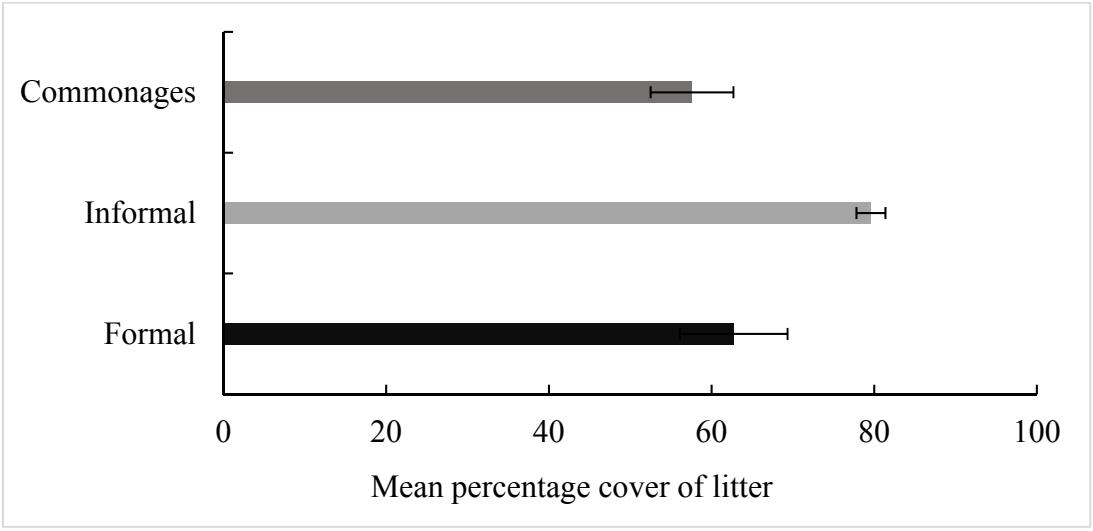

Figure 3.3. Mean percentage cover of litter within urban green spaces in two towns

Within 48 sampled green spaces, the formal and informal green spaces were the only spaces equipped with some recreational facilities (e.g. benches, play equipment, braai stands) (Table 3.1). Structures prompting a better upkeep of the spaces, like rubbish bins and signage, were lacking (Table 3.1). The quality of the available features within formal green spaces and

informal green spaces was very low (Figure 3.4) with most of the features vandalised, in bad shape or unfit for use.

Table 3.1. Number of recreational features within surveyed urban green spaces in two towns

Recreational feature	Formal (*n=11*)	Informal (*n=13*)	Commonages (*n=12*)	Total
Seating areas	7	1	0	8
Lighting	0	1	0	1
Play equipment	36	12	0	48
Shaded areas	4	0	0	4
Paved paths	2	0	0	2
Rubbish bins	0	2	0	2
Ablution facilities	0	0	0	0
Signage	4	2	0	6
Braai stands	11	0	0	11

3.4.2 The quality of features within green spaces

The urban commonages had the highest mean score for naturalness of 1.2 (on a 5-item rating scale), which shows a higher vegetation cover compared to the formal and informal spaces (Figure 3.4). However, the naturalness score was generally low since the available vegetation was of poor quality evidenced by overgrown herbs in formal green spaces, dense thickets of shrubs and mostly alien trees that were either diseased or forked. Across all green space types, the quality of recreational features scored the least, particularly in the urban commonages (mean score 0.01 on a 5-item scoring scale), while the formal green spaces had a relatively higher mean score (mean score 0.48). The formal green spaces showed better maintenance with a mean score of 0.9, whilst the informal green spaces scored the least (mean score 0.45) as there was high levels of litter and degree of dereliction. Concerning safety, the formal green spaces also scored high (mean score 1.1) compared to the informal green spaces (mean score 0.5) and commonages (mean score 0.6) (Figure 3.4). Generally, all the spaces had clear evidence of anti-social activities with a high occurrence of people smoking illegal substances, drinkers listening to loud music and vagrants resting, hence safety was regarded as very low in all spaces. Overall, the general quality of all the urban green spaces surveyed was limited.

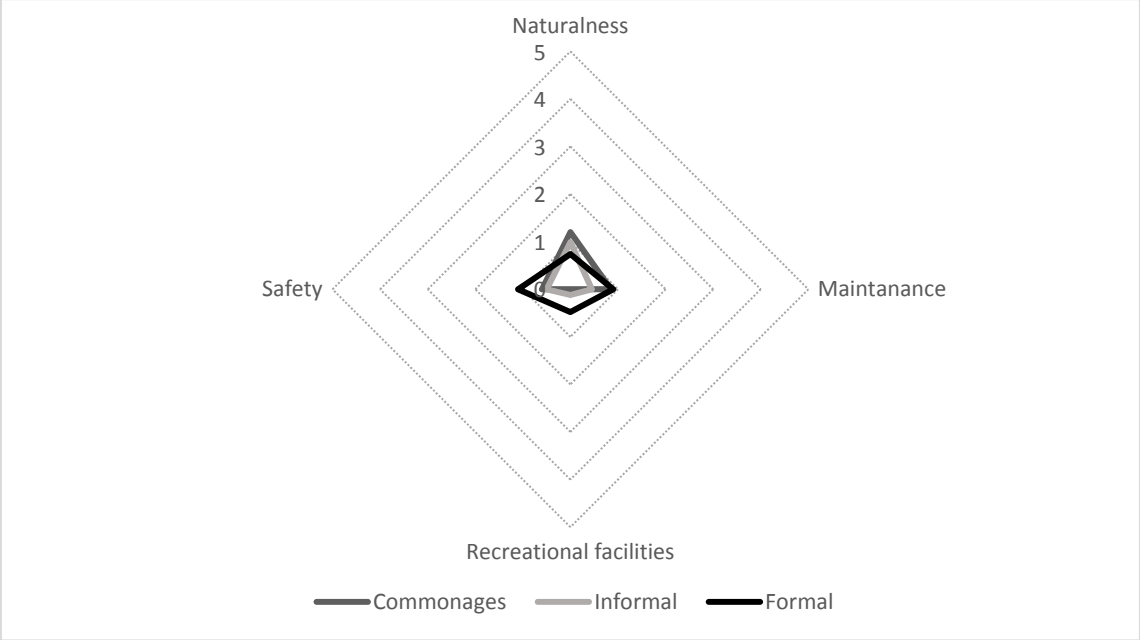

Figure 3.4. Mean scores for the overall quality of elements within urban green spaces in two towns

3.4.3 Respondent profile

Approximately three-fifths (58.9 %) of the respondents were female (Table 3.2). The most common age group was the 18-35 years old, followed by the 36-55 years old group. The least encountered age group were the elderly (> 56 years old) (Table 3.2). Most of the respondents were Xhosa speakers (96.1 %). All the respondents had some formal schooling, with 5 % attaining a post-school higher certificate or diploma/degree. Many of the respondents (46.1 %) were unemployed. Those who were employed and were willing to state their monthly income were mainly low-income earners (R1,000-5,000 per month). Other respondents shared that they relied on government grants/aid (17.5 %), remittances (5.9 %) and selling goods (8.6 %) as sources of income. However, approximately two-fifths (38.3 %) were unwilling to discuss their source of income (Table 3.2). The sample of respondents in this study is representative of the general socio-demographic information of the two study towns. For instance, both towns have more females than males (*Section 2.3.1 and 2.3.2*) and the sample in this study also has more females (58.9 %) being interviewed than males (41.1 %). Other factors like unemployment (at least 45 % of the sample) and attainment of education up to matric level are also representative of the general socio-demographics of both the study towns. Thus, the lessons we learn from this study can be generalised for the broader community and recommendations given to that end.

Table 3.2. Profile of respondents interviewed across different green spaces (formal, informal and urban commonages) in two towns

Variables	Types of green spaces			Total	Total
	Formal	Informal	Commonages	Frequency	Percent
Gender: Female	63	71	78	212	58.9
Male	55	55	38	148	41.1
Age: 18-35 years	47	55	50	152	42.2
36-55 years	43	44	47	134	37.2
>56 years	28	27	19	74	20.6
Language spoken: Xhosa	113	123	110	346	96.1
Other	5	3	6	14	3.9
Education level: Primary	26	18	20	64	17.8
Junior secondary	58	55	51	164	45.6
High school/matric	28	46	38	112	31.1
Certified/diploma/degree	5	7	6	18	5.0
Not specified	1	0	1	2	0.5
Employment status:					
Full/part-time	37	49	39	126	35.0
Unemployed	55	52	59	166	46.1
Students	7	5	6	18	5.0
Retired/unemployed	17	18	11	46	12.8
Not specified	1	2	1	4	1.1
Main source of household income:					
Salary/wages	28	44	37	109	30.3
Government grants	24	24	14	63	17.5
Remittances	3	4	12	19	5.3
Selling goods	17	6	8	31	8.6
Not specified	32	56	50	138	38.3
Estimated monthly household income:					
<R1,000	20	17	19	56	15.6
R1,000-5,000	44	40	36	120	33.3
R5,000-10,000	5	14	9	28	7.8
> R10,000	1	0	2	3	0.8
Not specified	87	40	26	153	42.5

3.4.4 Reasons for visiting green spaces

Descriptive statistics showed that the most common reason for visiting green spaces was 'passing through the green space' (99.1 %) (Figure 3.5). This was followed by 'To take children to play' (37.4%) came second whilst the motives 'To braai' (a gathering where people prepare different types of meat outdoors over fire), 'To exercise', and 'To conduct traditional practices' were the least mentioned motives. Reasons for visiting green spaces varied across gender and age groups. The reasons which were significantly different across gender included 'children's

playground' (χ^2=16.6; p=0.001), 'collect plants, herbs and fruits' (χ^2=9.1; p=0.01) and 'getting inspiration' (χ^2=13.1; p=0.001). The reasons which were significantly different across age groups included 'traditional purposes' (χ^2=9.5; p=0.04), 'community events' (χ^2=11.8; p=0.01) and 'relaxing' (χ^2=13.2; p=0.01). The most common reason to visit the space which was to be in transit varied between males and females, and age groups. Both men and women engaged in this activity, however, the younger respondents listed in this activity more than the middle-aged and elderly (Table 3.3). Taking children to play (37.4 %) came second, more women than men accompanied children to the green spaces for this activity. Braaing, exercising and conducting traditional practices were the least mentioned reasons. (Figure 3.5). The study also shows that the passive activities like relaxing, getting inspiration and escaping from the town were mostly done by males rather than females whilst the active form of activities like taking children to play and collecting plants, herbs and fruits were engaged in more by women. Herding of livestock was done by both men and women. Generally, more youth and middle-aged respondents made more use of the green spaces than elderly respondents (Table 3.3).

Table 3.3. The proportion of reasons for visiting green spaces by gender and age group

Reason for visiting	Frequency	Gender		Age group		
		Males	Females	Youth	Middle-Aged	Elderly
Walk through	225	48.4	51.6	42.7	35.6	21.7
Children's playground	85	42.4	57.6	49.4	30.6	20.0
Collect plants, herbs, fruits	72	44.4	55.6	34.7	38.9	26.4
Herd livestock	70	51.4	48.6	34.3	41.4	24.3
Be in nature	61	54.1	45.9	37.6	34.4	27.9
Relax	61	67.2	32.8	62.5	28.1	9.4
Get inspiration	53	69.9	30.1	49.1	30.2	20.7
Partake in community events	51	43.1	56.9	25.5	47.1	27.4
Escape from the city	45	64.4	35.6	46.7	35.6	17.8
Conduct traditional practices	39	53.9	46.1	25.6	43.5	30.9
Exercise	32	68.8	31.2	62.5	28.1	9.4
Braai	3	66.7	33.3	33.3	33.3	33.3

(Partaking in community events is inclusive of attending meetings called by the Councillor or Ward leaders, watching community soccer events and attend celebrations like Youth Day and Steve Biko commemorations).

The reasons for visiting the green spaces varied across different types of green spaces. The reasons which were significantly different across the different types of green spaces include

'Escape from city' (F=3.3; p=0.04), 'Collect plants, herbs, fruits' (F=92.8; p=0.001) and 'Partake in community events' (F=3.1; p=0.05). Post-hoc comparisons for these motives using the Tukey HSD test indicated that 'Escape from city' is significantly different between informal green spaces (M=1.86; SD=0.35) and commonages (M=8.54; SD=25.08) and not significant between other green spaces. 'Collecting plants, herbs and fruits' was significant across all the different green spaces, formal (M=1.99; SD=0.11), informal (M=1.74; SD=0.44) and commonages (M=1.18; SD=0.38). 'Partake in community events' was also significant between formal green space (M=2.91; SD=10.96) and commonages (M=12.23; SD=30.33) and there was no significant difference between other green spaces. Overall, reasons that were directly involved with direct use of the green spaces (e.g. collecting plants, fruits and herbs, herding livestock, conduct traditional practices) were mostly done in informal green spaces and commonages (Figure 3.5). Recreational activities like braaing, relaxing, partaking in community events were mostly mentioned in formal green spaces (Figure 3.5).

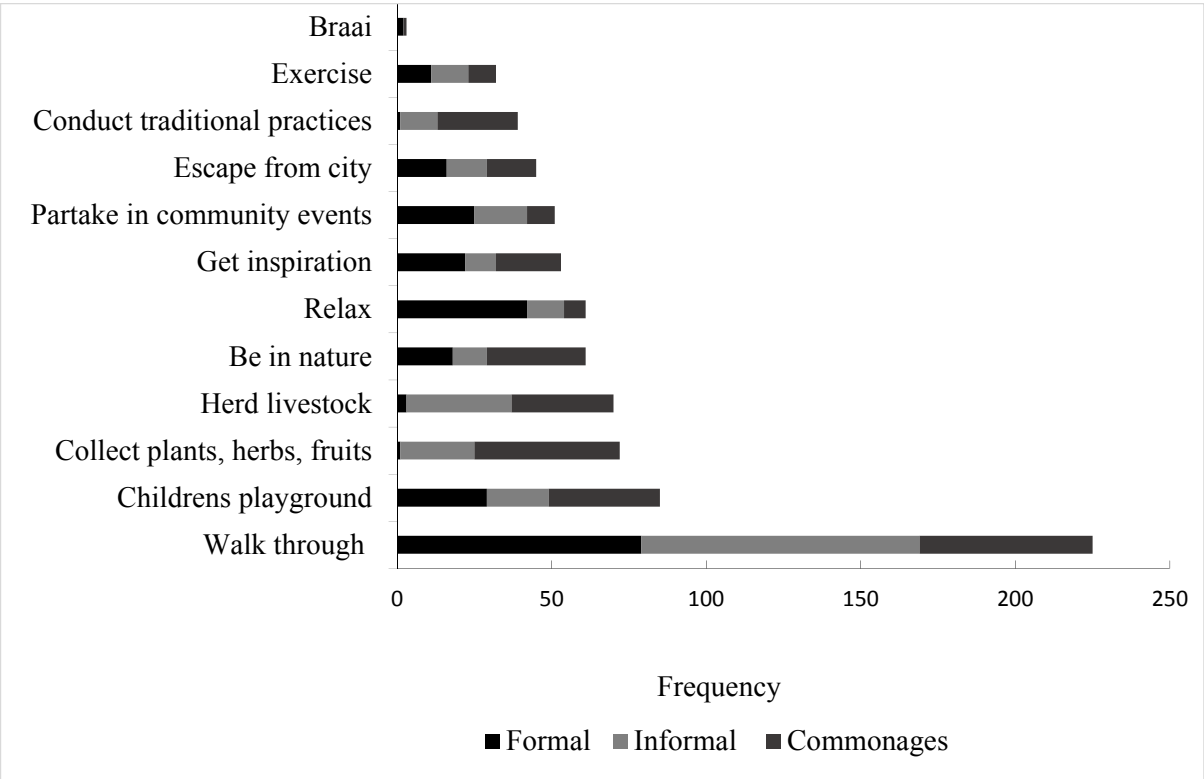

Figure 3.5. The frequency of reasons for visiting different green space types

3.5 Discussion

3.5.1 Composition and quality of features within urban green spaces

The results of this study suggest that there is significant variability in the composition and quality of features within the formal and informal green spaces and urban commonages studied and those in the Global North. Vegetation cover was not uniform across green space type, with the formal green spaces having the most lawn cover and relatively little cover of trees, shrubs and herbs. On the other hand, informal green spaces and municipal commonages had a relatively high cover of shrubs, herbs and trees and little lawn. These results suggest that across different green spaces there is clear distinction in the type of vegetation available. These results concur with Threlfall *et al.* (2016) who found that there is variation in vegetation structure and composition across urban green space types of Melbourne, Australia, with formal green spaces like urban parks having the least cover of shrubs, trees and herbs whilst open lawn being predominant issue.

The high cover of shrubs, herbs and trees in the municipal commonages can be attributed to the different land use as zoned by the local municipalities (Davenport *et al.,* 2012). Within the studied areas, the vegetation was either overgrown herbs, dense thickets of shrubs and mostly alien trees that were either diseased or forked. This resulted in the poor rating of vegetation across the green spaces. These findings corroborate those of Sanesi & Chiarello (2006) who found that green spaces in Bari, Italy, were rated as insufficient in quantity and also in quality by more than two-thirds of the sampled population. This trend however, differs from other locations, which have shown that urban green spaces are well endowed with various vegetation types and biodiversity (Bjerke *et al.,* 2006; Fuller *et al.,* 2007; Lindemann-Matthies *et al.,* 2010). Fuller *et al.* (2007) showed that the green spaces in Berlin, Germany, contained various habitat types which in turn harboured a high plant species richness. These results were also consistent with Özgüner's (2011) study in urban parks of Isparta, Turkey, who revealed that naturalness and greenery were the most appealing features in urban parks. Our findings, therefore, reveal that vegetation cover found within green spaces is a function of the type of green space. According to Threlfall *et al.* (2016) there are various underlying drivers behind vegetation composition, structure and quality within urban green spaces, these may include the innate human preferences for savanna-like landscapes, perceptions of safety, aesthetic preferences, efficiency of management and what the spaces are zoned for.

Similar to the disparity in the composition and structure of vegetation within the green spaces, there was a wide variability in the composition of recreational facilities across the green spaces. The formal green spaces were the only ones with amenities like play equipment, shaded areas and seating. Informal green spaces and commonages had little or no recreational features. Within informal green spaces they were availability of some play equipment, this equipment was mostly improvised as the see-saw available was made up of wood and the football poles were of different sizes and shapes. Marked differences in the availability of recreational facilities across different types of green spaces have been previously described by Zhang *et al.* (2013), Rupprecht *et al.* (2015) and Chen & Liu (2016). Van Herzele & Wiedeman (2003) argued that the presence of attractive recreational facilities within urban parks will influence the satisfaction of the user. Whilst in South Africa, the more formal green spaces (parks and sports fields) have been found to have varied recreational facilities in comparison with informal green spaces which have limited facilities or none (Shackleton & Blair, 2013). This corroborates results from larger cities in the developed world. Rupprecht *et al.* (2015) assert that informal green spaces 'are real and not fake like parks' thus they rarely contain any recreational features within them. Moreover, the urban commonages of South Africa were not designed or set aside for recreational use but rather to provide land for subsistence use and provide grazing for increasing urban migrants who brought their livestock to towns and cities (Davenport *et al.,* 2011; 2012). This talks to the design and management of public green spaces in the two towns, which reveals that informal green spaces and urban commonages are not regarded as spaces where people can recreate and relax. The municipalities and urban planners should recognize these spaces as avenues being used for different activities. Thus, appropriate facilities, maintenance and safety needs to be put in place within these spaces.

Within formal green spaces the quality of recreational facilities was poor, and many were vandalized. A high degree of vandalism of signage, seats and play equipment in other formal green spaces in the Eastern Cape, has been reported (Njwaxu, 2015) and in Kuala Lampur, Malaysia (Abdul Malek & Mariapan, 2009). Although reported cases have shown cases of poor-quality recreational features within urban green spaces in the developing countries (Abdul Malek & Mariapan, 2009; Njwaxu, 2015, this is not true for most of the developed world. Formal green spaces in the Global North, specifically urban parks, are well known for recreational amenities that attract frequent visits. Hence, an array of activities like picnicking and barbeques (Özgüner, 2011), resting and relaxing (Swanwick *et al.,* 2003; Palliwoda *et al.,* 2017), aesthetic enhancement (Jim & Chen, 2006) and social interaction (Peters *et al.,* 2010)

are an attraction. With regards to maintenance, all green space types showed low levels of upkeep and lack of proper management. This is consonant with other studies that have reported low maintenance and low levels of cleanliness were the highest deterrents to the green space use (Gobster, 2002; Swanwick *et al.,* 2003; Özgüner, 2011). Similarly, Sanesi & Chiarello, (2006) identified low levels of maintenance within formal green spaces typified by used syringes, precarious branches, unstable plants and the presence of stray animals within the spaces. The study shows how these spaces can be seen as an 'eyesore'. Poor maintenance of green spaces within the study impairs the attractiveness of these spaces and hence deters some local residents from visiting or making more substantial use of them.

Forsyth (2003) identifies that the condition of green spaces in terms of maintenance and safety are often linked, with many respondents viewing areas with poor maintenance as uncared for and potentially unsafe. In my study, insufficient lighting and the presence of vagrants were identified as contributing towards not feeling safe. Such feelings were heightened by the presence of anti-social behaviour of some users, which included smoking illegal substances, drinking alcohol and playing loud music. These findings corroborate those of Sanesi & Chiarello (2006) who reported that anti-social behaviour found at public parks in Bari, Italy acted as deterrents for some users. According to Jim & Chen (2006) lack of lighting was a deterrent to green spaces users in Guangzhou, China. In my study, across all the spaces surveyed, no lighting was available. This can have implications on the number of people visiting such spaces in the evening. The informal green spaces and commonages had no safety features, compounded by the dense vegetation, found in these spaces. This result concurs with findings from elsewhere whereby dense vegetation is seen as deterrent to visitors (Jorgensen *et al.,* 2002; Bjerke *et al.,* 2006; Zhang *et al.,* 2013). To counteract such drawbacks, security of green spaces has been identified as a major priority. Security measures identified as appropriate include proper fencing, frequent patrols and lighting (Swanwick *et al.,* 2003; Zhang *et al.,* 2013; Shackleton *et al.,* 2015).

3.5.2 Reasons for visiting urban green spaces

In common with findings from elsewhere, this study has shown that there are multiple reasons for visiting urban green spaces (Chiesura, 2004; Özgüner, 2011; Bertram & Rehdanz, 2015; Palliwoda *et al.,* 2017). Overlaps in reasons for visiting green spaces such as nature based (Chiesura, 2004; Sanesi & Chiarello, 2006; Shan, 2014) and leisure based (Özgüner, 2011; Bertram & Rehdanz, 2015) reasons occurred. The majority of respondents in this study felt that

green spaces provided walkways and transit spaces. The use of urban green space as a transit space is consistent with Latham (2008) who reported that most public spaces are just used for transit. Moreover, the composition and attributes of the green spaces (see Section 3.4.2) do not encourage the user to partake in active forms of recreation within the spaces, as has been reported in Lincolin Park, Chicago (Gobster, 2002), Perth, Australia (Giles-Corti *et al.,* 2005) and Amsterdam, Netherlands (Peters *et al.,* 2010). This suggests that paths or pavements of proper quality, planting decoration of the roadside should be put in place for enjoyable walking for the user. To increase the number of people using the green spaces at any given time, a more thoughtful design is needed (Giles-corti *et al.,* 2005). More attention could be given to creating paths that follow traditional foot paths (e.g. desire lines) that people use to get to their various destinations, which would most likely avoid vandalism of fences which prohibit people from accessing main pathways used.

Hartig *et al.* (2014) identify that most urban green spaces provide a platform where people can partake in nature-based activities, being either consumptive (collecting herbs, fruits and flowers, fishing) or non-consumptive (bird watching, hiking, nature walks, photography). In my study, nature-based activities were evident in the municipal commonage. Most reasons cited for such areas included consumptive rather than non-consumptive purposes. This is a similar finding to Davenport *et al.* (2011; 2012) who revealed that the municipal commonages provide access to resources used for energy (fuelwood), for health care (medicinal plants) and grazing for livestock. Resources harvested supplement livelihoods for many low-income households (Kaoma & Shackleton, 2014). In contrast with studies in the Global North, people primarily engage in nature-related activities whether consumptive and non-consumptive purposes, within formal green spaces (McLain *et al.,* 2014; Palliwoda *et al.,* 2017). Therefore, the formal green spaces within the two study towns do not offer varied natural features, which encourage nature-orientated activities. This is exemplified in the following quote:

> "There is no nature in these spaces next to our homes; some trees which have been there were cleared when people were erecting some informal settlements, when I want to really be in nature I go to the rural areas. There is no nature in the city…" (45-year-old man, Queenstown, 2017).

McConnachie & Shackleton (2010) echoed similar findings by asserting that there is limited public green space per capita in low income areas of the Eastern Cape, South Africa. Hence, this limits the user's opportunities for visiting urban green spaces. Urban foraging activities are

increasingly being common in formal green spaces (McLain *et al.,* 2014; Palliwoda *et al.,* 2017), but was found to be very low in this study, perhaps due to the low quality of the green spaces.

Other reasons to visit green spaces included recreational purposes (braai, exercise, partake in community events), escaping the busy town or city life, to be inspired, social interaction and taking children. However, these were not done frequently (Figure 3.5). Recreational reasons were largely cited by users visiting formal green spaces as opposed to informal green spaces and municipal commonages. In contrast to findings from other studies from other parts of the world, recreational purposes were the dominant reasons for visiting formal green spaces and were carried out more frequently (Chiesura, 2004; Jim & Chen, 2006; Özgüner, 2011; Zhang *et al.,* 2013). However, the limited use of formal green spaces in this study showed that the green spaces lacked the proper facilities to attract people to use them in large numbers (see Section 3.4.1). This mirrors Shackleton & Blair (2013) who found that limited amenities and a lack of maintenance of public urban green spaces in the Eastern Cape, South Africa, were the main reasons as to why people were not motivated to visit such spaces. Providing basic amenities like shelter, seats, water taps, and lights were suggested as a means to increase the number of users of public urban green spaces.

Informal green spaces and municipal commonages areas in this study did not offer many recreational opportunities. This is because the informal green spaces and municipal commonages mostly contained physical features like trees, shrubs and grass and less of the artificial features. Hence, such areas were not sought after for recreational needs, despite being in close proximity to many urban residents. Corbin (2003) argued that informal green spaces are empty spaces or useless spaces. However, recently Rupprecht *et al.* (2015) revealed that informal green spaces offer uninterrupted nature contact as opposed to formal green spaces which are regarded as 'fake like' (Rupprecht *et al.,* 2015). This is true for some reasons (e.g. to conduct traditional practices, escaping from the city, getting inspired) cited for visiting informal green spaces in this study. It is therefore important that planners recognize that the informal green spaces can improve liveability of towns and cities by offering a complementary space for recreational purposes, and thus development plans should be done to cater for such.

Previous research has revealed that reasons to visit urban green spaces may vary according to age, gender, education and marital status (Chiesura, 2004; Shan, 2014). This confirms the findings of this study since some reasons, like relaxing, exercise and getting inspiration from

the green spaces, varied between genders and age groups. The finding that males frequently mentioned relaxing and getting inspiration departs from prior studies (Sanesi & Chiarello, 2006) where males typically visited the green spaces for more active engagements. The differences among the results may be a function of different lifestyle and upbringing, and this warrants more in-depth studies. Furthermore, playing with children was a frequently cited reason for visiting green spaces by females as compared to males. This was also mentioned in other studies (Sanesi & Chiarello, 2006; Özgüner, 2011; Bertram & Rehdanz, 2015). In addition, Sanesi & Chiarello (2006) revealed that the reason for accompanying children to the spaces was predominantly mentioned by females (40 %) in comparison to males (18.6 %) in Bari, Italy. This talks to how women are usually care providers for children (Shan, 2014). Also, women frequented green spaces for collection of firewood, herbs and fruits. This corroborates other studies which reveal that women are more actively involved in collection of urban non-timber forest products (Hurley *et al.,* 2014; Palliwoda *et al.,* 2017). Further studies in how gender modulates people and urban green space interactions are therefore important as they can influence the planning of urban green spaces which are befitting for everyone.

Age also influenced who visited green spaces. For example, the majority of users represented young people (18 to 35 years) and middle-aged (36 to 55 years). Of note is the use of green spaces mostly by the youth whilst there were few elderly people. This confirms findings by Chiesura (2004) in Amsterdam where young persons were more likely to exercise in the green spaces than the elderly. Our study revealed that seeking opportunities for inspiration and escaping from the hustle and bustle of township life were taken more by younger generation in comparison to the elderly, this can be linked to the general condition of the green spaces and also safety concerns for the elderly. Generally, younger people in the study frequented the green spaces more than the elderly, thus this raises questions about the available green spaces being able to accommodate all ages and offer uses for all.

3.6 Conclusion

The composition and quality of features within urban green spaces are considered key elements in building sustainable towns in the Eastern Cape. This is because of the innumerable benefits that can be acquired from them. However, this study has revealed that vegetation within all green spaces is general of poor quality with formal green spaces having less tree, shrub and herb cover in comparison to the informal green spaces and municipal commonages. In addition, there were limited recreational facilities across all green spaces. Across all the green space

types, there were low levels of maintenance, safety, recreational facilities and natural features. The attributes of these spaces therefore influenced the motives for visiting and using these spaces. More than 90 % of the respondents simply walk through such spaces rather than visit the green spaces for a particular purpose. To increase the number of users of to such spaces the quality of the features in the various spaces needs to be improved and even be built and provided in those were they are not available.

South Africa has high crime rates, especially in low-income areas, hence the design of the green spaces should consider this social ill. Specific measures should be put in place to ensure that people visiting such spaces can do so without fear. Such measures include lighting to increase visibility, frequent monitoring and policing, as well as regular maintenance. The role of gender in influencing relationships between people and urban green spaces is an important issue which requires further research to be able to plan sustainable green spaces for all. In addition, the findings of the study suggest complex interactions between age and reasons for visiting green spaces, hence the need for planners to consider the needs of different age groups when designing and planning for public green spaces. Decision makers should consider the needs of different groups in the society so that green spaces are managed in a way that meets the needs of the users. Finally, raising awareness in communities and among park users of the importance of the green spaces among them is crucial to the better functioning of the green spaces around them. Awareness and education among the park users can develop a sense of place and sense of belonging towards the green spaces around them as they can take better care of them and understand that the spaces are valuable to them.

CHAPTER 4

ATTITUDES AND PREFERENCES TOWARDS FEATURES WITHIN URBAN GREEN SPACES

4.1 Chapter overview

This chapter addresses objective 2 (see Section 1.8.2), namely to explore user attitudes and preferences towards features within urban green spaces. The following research questions are addressed:

- What are the features that are observed by users within different urban green spaces?
- How do users feel towards observed features within different urban green spaces?
- What features and characteristics do users prefer or dislike about different urban green spaces?
- What is the most preferred design/type of urban green space?

4.2 Introduction

Urban green spaces are increasingly recognized as important spaces for enhancing urban dweller's wellbeing and quality of life (Turner *et al.,* 2004; Fuller & Gaston, 2009; Shanahan *et al.,* 2015). Such spaces can take on many different forms. Key influencing factors include the type of natural features they contain, the type of vegetation they harbour, recreational features found within them and the various uses they offer (Hegetschweiler *et al.,* 2017; Madureira *et al.,* 2018). Increasing evidence has indicated that features and components (e.g. trees, water, herbs, play equipment, sports facilities, seats, shelter) within the urban green spaces offer both tangible and intangible benefits and services to city dwellers (Chiesura, 2004; Özgüner, 2011; Zhang *et al.,* 2013). The diversity of these features, their arrangement and design evokes varying attitudes, perceptions and preferences towards urban green spaces. Thus, it is important to understand people's perceptions, attitudes and preferences towards these features across cultures, ethnicity, race and different socio-economic attributes (Chiesura, 2004; Özgüner, 2011; Shackleton *et al.,* 2015; Madureira *et al.,* 2018).

Earlier studies have alluded to the various perceptions, attitudes and preference towards natural features within green spaces, for example, highly biodiverse urban parks with trees, birds and

butterflies increased psychological fulfilment of green space users in Sheffield, United Kingdom (Fuller *et al.,* 2007). Nordh *et al.* (2009) showed that the percentage of grass cover, trees and bushes were predictive of the likelihood of feelings of restoration. Özgüner (2011) suggests that residents of Isparta, Turkey, preferred to be in parks and to be in contact with nature but predominantly to be involved in passive recreational activities, hence the need for seats, play areas for children and barbeque facilities. The presence of recreational features have also been reported to increase social interaction and place attachment among Dutch and non-Western migrants in the Netherlands (Peters *et al.,* 2010).

Some researchers have also revealed negative attitudes towards certain features within urban green spaces (Gobster, 2002; Jorgensen *et al.,* 2002; Bjerke *et al.,* 2006; Shackleton *et al.,* 2015). For example, the presence of too many trees and shrubs has been associated with potential for and fear of criminal activity (Sreetheran & van den Bosch, 2014; Shackleton *et al.,* 2015). The presence of derelict and vandalized features within urban green spaces has also left visitors feeling sad, disappointed and angry (Abdul Malek & Mariapan, 2009; Njwaxu, 2015; Rupprecht *et al.,* 2015).

Most of this research has been carried out within developed countries and not within developing contexts. In relation to the former, differences between different cultures and countries have been found to influence people's attitudes and preferences towards urban green spaces (Gobster, 2002; Peters *et al.,* 2010), thus highlighting the need to also understand attitudes and preferences from a developing country context. South Africa is ideally situated to contribute to such understandings as it is situated in the Global South and is culturally diverse. Furthermore, most of the research carried out within South Africa within this context has focussed on uses, cultural preferences and attitudes towards trees (Kaoma & Shackleton, 2014; Gwedla & Shackleton, 2015; Shackleton *et al.,* 2015) with no examination of other features. The results presented in this chapter seek to address these identified gaps by exploring the attitudes and preferences for a range of features within urban public green spaces within a developing country context. The objective was to explore user attitudes and preferences towards features within urban green spaces.

4.3 Methods

The study employed both qualitative and quantitative data collection techniques (as described in detail in Chapter 2). A survey was the main tool used for data collection complemented by narrations of attitudes towards features within spaces from respondents. To investigate the

attitudes and preferences towards the features within the urban green spaces a survey was performed by use of a questionnaire (Appendix 2). The data was then coded, described and analysed in Microsoft Excel, SPSS version 21 and CANOCO version 5.

4.4 Results

4.4.1 Visitors observation of features in green spaces

Most of the respondents mentioned litter (134 mentions) as the first feature they saw when they visited green spaces (Table 4.1). This was followed by the presence of children playing (95 mentions) within the spaces and livestock (72 mentions). The least mentioned features included mountains (1), firewood (5), flowers (5), open space (5) and birds (7). Most commonly cited natural features observed included trees (61 mentions) and shrubs (55 mentions).

The green space type strongly influenced the features that people first observed (χ^2=165.4; p=0.001). The variation in the observed features within different green space types is summarised by the Principal Component Analysis (PCA) (Figure 4.1). The total variance accounted for by the first two axes of the PCA was 63.5 %. There was a strong association between the artificial elements such as swings/play equipment and benches in the formal green spaces whilst these were not observed within informal green spaces and urban commonages. The only natural feature that was mentioned within the formal green spaces were flowers. The presence of litter was strongly associated with the informal spaces (Figure 4.1). Most natural features (e.g. trees, bushes, floodplain) had a strong association with the informal green space. Urban commonages were associated with wild animals, herbs and shrubs, grass and firewood.

Table 4.1. Features first noticed in urban green spaces of two towns (F-formal, I-Informal, C-Commonage)

Features in green space	Total no. of mentions												
	Feature 1			Feature 2			Feature 3			Total			
	F	I	C	F	I	C	F	I	C	F	I	C	G-T
Litter	9	39	20	11	19	8	12	11	5	32	69	33	134
Children playing	21	9	0	25	16	0	8	15	1	54	40	1	95
Livestock	0	7	9	3	13	11	8	12	9	11	32	29	72
Trees	6	7	7	6	5	11	9	4	6	21	16	24	61
Bushes/shrubs	1	6	20	5	3	3	3	9	5	9	18	28	55
Swings/play equipment	26	0	0	10	0	0	12	0	0	48	0	0	48
People	2	5	0	5	14	5	5	5	2	12	24	7	43
Patches of grass	0	1	5	1	0	8	1	1	9	2	2	22	26
Floodplain	1	2	5	1	4	3	0	6	4	2	12	12	26
Braai stands	2	2	0	4	2	0	2	4	0	8	8	0	16
Stones/rocks/kopjes	1	3	0	0	2	1	1	4	3	2	9	4	15
Wild animals	0	0	3	0	2	3	0	5	2	0	7	8	15
Sports facilities	1	3	0	0	3	0	3	2	0	4	8	0	12
Benches	4	0	0	4	0	0	4	0	0	12	0	0	12
Enclosure/fencing	5	1	0	2	0	0	1	0	0	8	1	0	9
Dam	0	1	0	0	4	0	1	3	0	1	8	0	9
Birds	0	1	3	1	0	0	2	0	0	3	1	3	7
Open space	1	1	0	1	0	0	1	1	0	3	2	0	5
Flowers	0	1	1	1	0	0	2	0	0	3	1	1	5
Firewood	0	1	0	0	0	0	0	0	4	0	1	4	5
Mountain	0	0	0	0	0	1	0	0	0	0	0	1	1

Feature 1, 2 and 3 refer to the first feature, second feature and third feature that respondents observed when in the green space next to their residential homes.

G-T- total mentions in all spaces

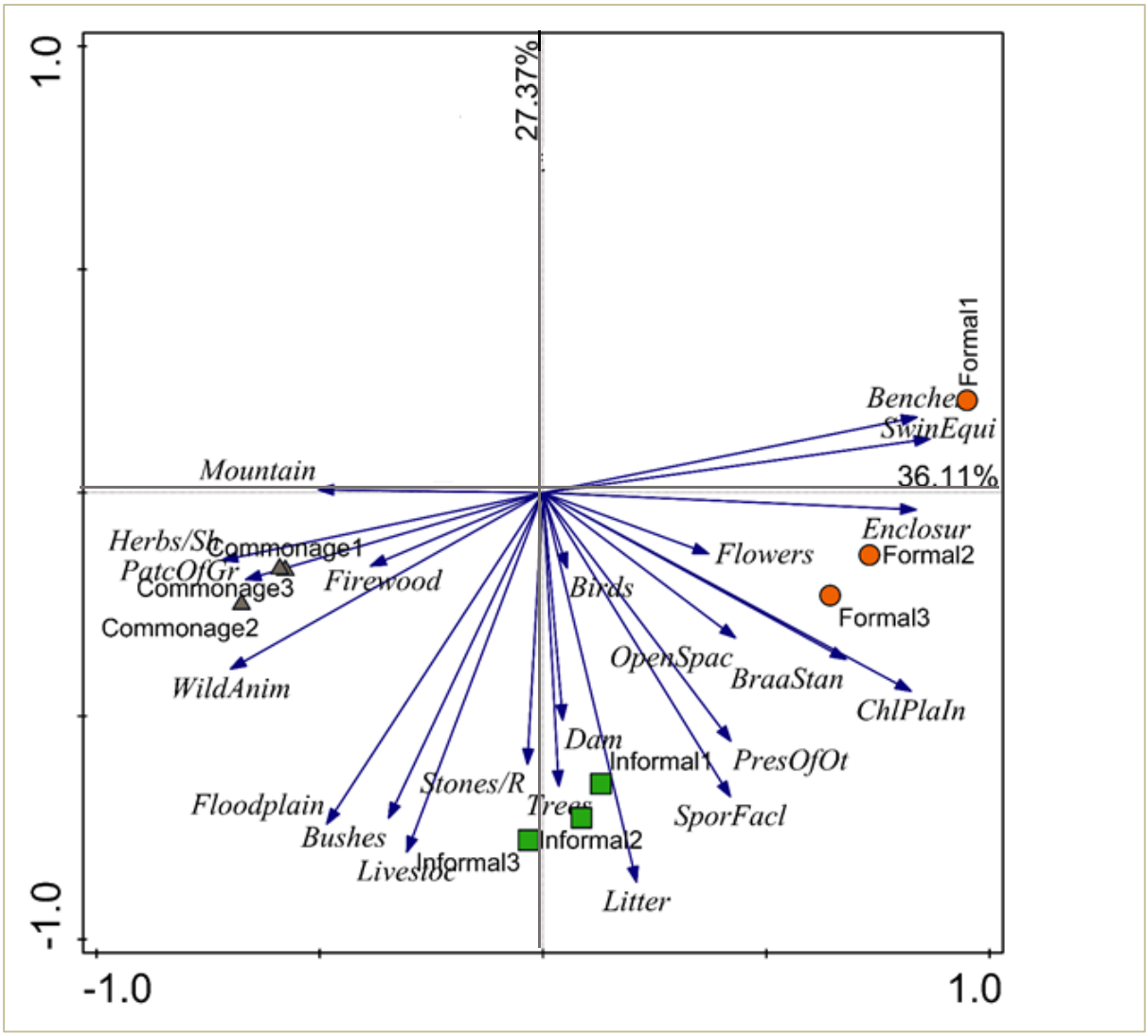

Figure 4.1. Principal Component Analysis (PCA) biplot illustrating the relationship between the observed urban green space features (blue lines projecting from the origin). Length of lines indicate the strength of the correlations.

4.4.2 Attitudes towards features in green spaces

The results of the Redundancy Analysis (RDA) display the relationship between features observed within the green spaces and attitudes towards these features (Figure 4.2). The first two axes of the response-explanatory relationship plot accounted for 48.8 % of the total variance. Artificial elements like swings, enclosure and benches within the formal spaces were strongly associated with sentiments of happiness. Some natural elements like birds, flowers and trees were also associated with happiness; however, trees were also associated with sadness (Figure 4.2). Users expressed sadness mostly towards litter, vandalized sports facilities and

anti-social behaviour within some informal spaces and commonages. Features such as floodplains, bushes and reservoirs within informal green spaces were associated with fear.

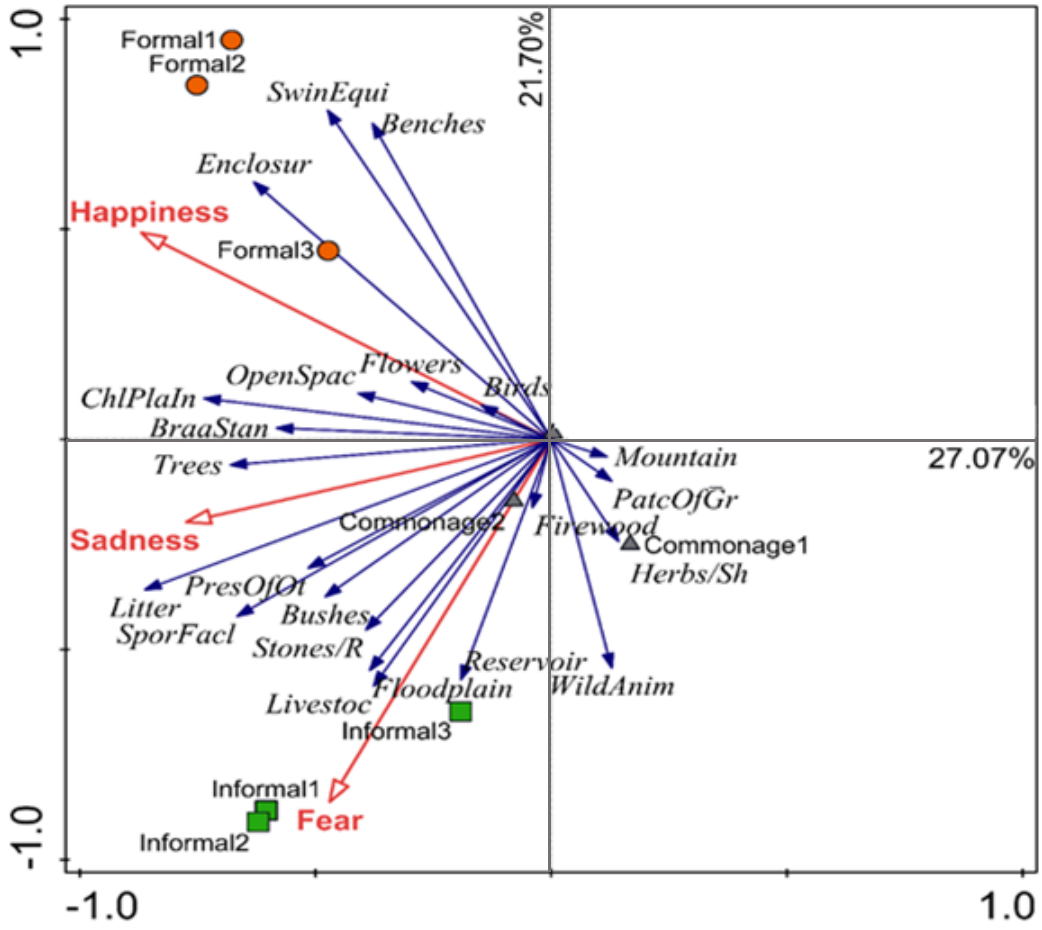

Figure 4.2. Redundancy Analysis (RDA) triplot of features within urban green spaces (as indicated by blue arrows) and attitudes towards them (as indicated by red arrows) against controlling variables (types of green spaces: formal, informal and urban commonages).

Some narrations which reveal the perceptions about features within green spaces are presented in Table 4.2.

Table 4.2. Narratives about features within urban green spaces in two towns

Negative narratives:
The park does not have facilities like gym, sports facilities and youth centre for us to go and learn different life skills rather just some broken equipment that is dangerous even for our young siblings to play on' (18-year old woman; formal green space, King Williams Town, 2017).

'This is a park by name only, there is no proper play equipment for children, and even if you take them there is nowhere to sit whilst on the other hand, someone would be burning some rubbish and there are used pampers which are thrown there, it smells' (31-year old woman; formal green space, King Williams Town, 2017).

'This park is meant for children only, what would I do there? Am too old to be playing on swings and other play stuff, there should be benches for us old people to sit and rest and just have a place to escape to from our dying beds' (75-year old woman; formal green space, Queenstown, 2017).

'This is not a park, where livestock eat!!!! No, this municipality is not doing their job, I have stayed in big cities before, I know how a park looks like and this space is not it' (44-year old woman, formal green space, Queenstown 2017).

'*This space has been turned into hotspot for robbing and raping our sisters and wives because the vegetation conceals the perpetrator so you cannot see who or what is in there. We have asked the council to come and cut the vegetation but there has not been any response and even if they do, when it rains the vegetation grows fast because of the river flowing in that place' (34-year old man, informal green space, King Williams Town, 2017).*

'It is scary to walk across this space when I am coming from school because there are guys who sit in there and they say all sorts of insults and sometimes they want to touch you even if you clearly tell them you are not interested' (19-year old woman, informal green space, King Williams Town, 2017).

'The commonages are places were men go to herd cattle and carry out the circumcision ritual, as women we are not allowed to go there because it is against our culture, moreover there have been reported incidences of rape in that area' (37-year-old woman, Queenstown, 2017).

'It has been rumoured that at the dam there is a snake which stays there, hence I will not go close to that space because all the rumours are associated with witchcraft' (61-year old man, informal green space, Queenstown, 2017).

'There is no nature in these spaces next to our homes; some trees which have been there were cleared when people were erecting some informal settlements, when I want to really be in nature I go to the rural areas. There is no nature in the city' (45-year old man, informal green space, Queenstown, 2017).

'Most young men in this neighbourhood go that space to chill under those bushes, they talk and laugh loud there but I will never go that space, I guess it is because most crimes committed there are against women because we are vulnerable however, if it is a man maybe the robbers are scared' (29-year old woman, informal green space, King Williams Town, 2017).

Positive narratives:

'That is my favorite place to go (commonages) in this township because when we are there with my friends we can discuss our youngster issues without our parents meddling' (21-year old man, Queenstown, 2017).

'This park is the only close place where my children can go and play in whilst I monitor them because other children play in streets and roads and that is not safe' (32-year old woman, formal green space, King Williams Town, 2017).

'The park has lawn and there are no trees and crowded bushes so I can walk there and sometimes exercise freely without fear' (41-year old woman, formal green space, King Williams Town, 2017).

'There are always people at the park, its busy there, hence I can visit without fear and community events are held there' (51-year old woman, formal green space, Queenstown, 2017).

'This space during the summer is so beautiful, many kinds of birds are available and when I walk to work, it is always interesting to see nature up close with various colourful birds and also they wake me up in the morning' (33-year old man, municipal commonage, Queenstown, 2017).

'Ihlathi provides us with firewood, fruits, and medicinal plants that we use in our day to day lives, sometimes I sell some of the herbs and provide for my family' (57-year old woman, municipal commoange, Queenstown, 2017).

'This space is the closest that resembles a natural environment to me, I grew up here in Zwelitsha and all I know is paved roads and buildings hence, this commonage makes my soul happy and at peace' (27-year old man, King Williams Town, 2017).

Ihlathi is the area where there is dense vegetation, and this is usually in commonages within an urban context.

The narrations in Table 4.2 reveal that the formal green spaces are not well-equipped with adequate facilities with people prefer. The parks in this study are also perceived as places which

only cater for children with no facilities for the youth, middle aged and elderly. Some elderly people raised concerns about the available formal green spaces only containing children's play equipment with limited facilities for them to use. In addition, the presence of livestock foraging in the parks makes people view these spaces differently. Other respondents however, feel that parks provide a safe place where children can play without fear of children being involved in road accidents. Moreover, parks are perceived to be safe as there are no trees and shrubs.

The ability to engage in cultural practices is a vital component of the lived reality for many Xhosa township residents. One respondent mentioned how the green spaces around them do not reflect his ideology of nature which suggests that some people in urban areas are being estranged from nature. Some cultural restrictions however, prevent some women to go to the municipal commonages freely as there are not allowed near cultural sites. Those who do visit the forest regularly are predominantly male and frequent the forest for initiation or to help out with other boy's initiation in the community. The narrations above reveal the safety concerns that many women and men have about visiting local green spaces. In many instances such fears even prevent many from visiting such spaces. The issues of snakes, spiritism and witch craft also were raised by some respondents as one dam in the informal green spaces was associated with the appearance of a snake, thus people being scared and to go near the dam. On the other hand, municipal commonages were the only places considered as natural environments thus, people enjoyed the several benefits like collecting firewood, fruits and medicinal plants. Through the collection of firewood, agency is given to residents even within the poorest households. Despite age and gender, some respondents felt that the pockets of green spaces next to their homes are the only or closest form of resemblance of a natural setting. The municipal commonage therefore remains irreplaceable in fulfilling cultural traditions as it provides subsistence for elements ranging from medicinal plants, to firewood collection and animals to hunt and encompasses complexly interwoven meanings ingrained in Xhosa culture ranging from the functional to the cultural.

4.4.3 Green space features that deter non-users from visiting

The main deterrent to visiting green spaces was a lack of cleaning and maintenance (Figure 4.3). This was followed by the presence of dense thickets and shrubs within informal green spaces and commonage. The presence of anti-social behaviour, particularly in informal green spaces, also deterred users (Figure 4.3). The presence of wild animals and presence of vandalized structures were the least mentioned deterrents. Deterring features varied greatly

across different green spaces (χ^2=34.9; p=0.01). The general trend was that deterrents were more commonly associated with informal green spaces and commonages (e.g. lack of maintenance, thick dense shrubs, perceived risk, vandalized structures), and that they were mentioned less for formal green spaces.

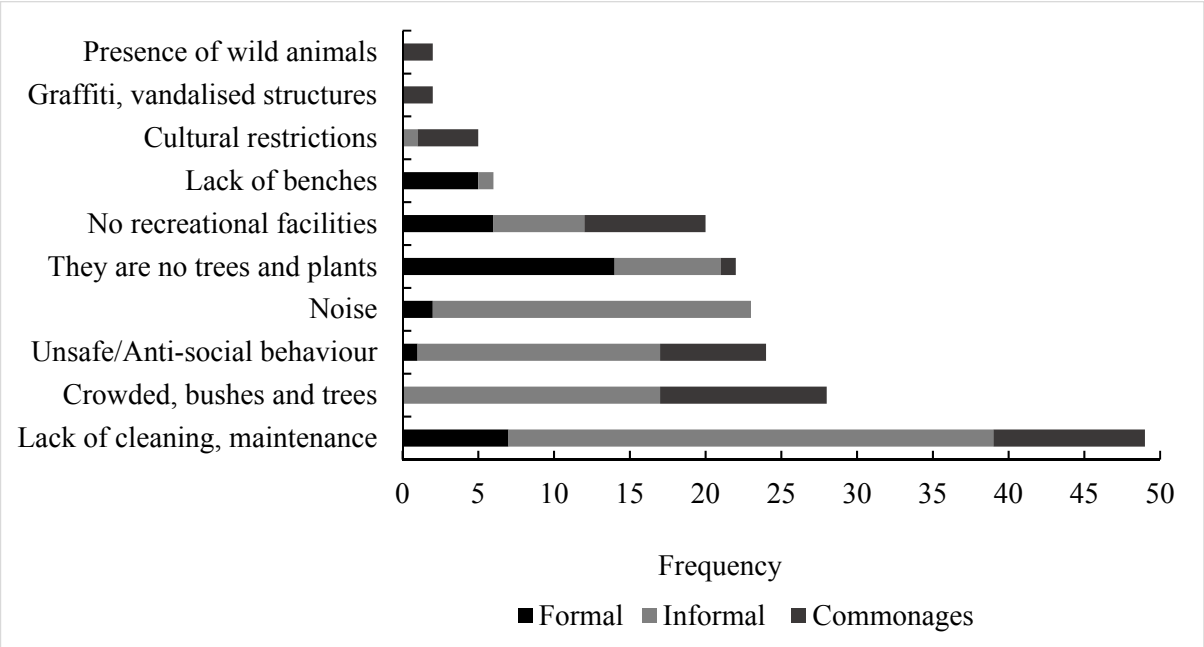

Figure 4.3. The frequency of features that deter non-users from visiting urban green spaces

Features that deter non-users from visiting green spaces varied across gender and age. Generally, women felt more discouraged to visit green spaces because of the lack of maintenance (70.2 %), the spatial arrangement of the vegetation (60.7 %) and unsafe behaviour (62.5 %) within the spaces (Table 4.3). Female users were significantly more affected by cultural restrictions (80 %) thus limiting their visits to the municipal commonages. With regards to age, the youth were deterred the most from visiting green spaces by cultural restrictions (60.0 %), unsafe and anti-social behaviour (58.3 %) and the absence and limited recreational facilities (50.0 %). Whilst the middle-aged cited absence of trees and plants (71.4 %) and lack of cleaning and maintenance (66.0 %) as some of the highest deterrents. Whereas more elderly users cited noise (56.5 %) as a significant deterrent followed the dense vegetation (35.7 %) (Table 4.3).

Table 4.3. The proportion of deterring features by gender and age group

Deterring features	Frequency	Gender		Age group		
		Males	Females	Youth	Middle-Aged	Elderly
Lack of cleaning, maintenance	49	29.8	70.2	23.4	66.0	10.6
Crowded, bushes and trees	28	39.3	60.7	25.0	39.3	35.7
Unsafe, anti-social behaviour	24	37.5	62.5	58.3	25.0	16.7
Noise	23	30.4	69.6	17.4	26.1	56.5
Absence of trees and plants	22	57.1	42.9	14.3	71.4	14.3
No recreational facilities	20	30.0	70.0	50.0	30.0	20.0
Lack of benches	6	50.0	50.0	50.0	16.7	33.3
Cultural restrictions	5	20.0	80.0	60.0	20.0	20.0
Graffiti, vandalized structures	2	0	100.0	0	100.0	0
Presence of wild animals	2	0	100.0	100.0	0	0

4.4.4 Preferred features within green spaces

Most of the respondents regarded green spaces as play areas, hence the most preferred feature within these spaces were swings and play equipment (101 mentions). The association of green spaces with play areas for children also made respondents prefer these spaces to be enclosed and monitored by a security guard (75 mentions and 40 mentions, respectively). The only natural feature mentioned by respondents was the presence of trees (34 mentions). The preferred features mentioned the least were educative billboards, birds, and a paved pathway/ parking space with three, four and four mentions, respectively (Table 4.4).

Table 4.4. Features preferred in urban green spaces (*F*-formal, *I*-Informal, *C*-Commonage)

Preferred features	Total no of mentions												
	Feature 1			Feature 2			Feature 3			Total			
	F	I	C	F	I	C	F	I	C	F	I	C	G-T
Swings/play equipment	19	17	5	13	15	3	11	9	9	43	41	17	101
Fencing/enclosure	12	13	6	14	12	4	2	10	2	28	35	12	75
Security guard	16	1	0	5	6	0	9	3	0	30	10	0	40
Trees	5	2	0	10	1	0	10	5	1	25	8	1	34
Toilets	6	5	1	5	4	2	9	2	0	20	11	3	34
Houses	0	6	11	0	3	8	0	1	4	0	10	23	33
Benches/seats	6	3	0	5	6	0	5	3	1	16	12	1	29
Sports facilities	3	7	2	1	9	3	1	2	0	5	18	5	28
Restaurant/tuckshops	0	4	1	0	4	7	2	4	1	2	12	9	23
Gardens	0	3	7	0	4	4	0	2	2	0	9	13	22
Bins	2	0	2	4	5	0	2	4	2	8	9	4	21
Braai stand/area	1	0	0	7	0	0	7	2	0	15	2	0	17
Lawn	2	2	0	3	1	0	2	6	1	7	9	1	17
Water taps/tank	3	1	1	2	1	1	4	4	0	9	6	2	17
Clinic/rehab centre	0	2	3	0	1	6	0	2	3	0	5	12	17
Day care	0	4	2	0	5	2	0	3	0	0	12	4	16
Playground/open space	1	2	5	0	1	0	2	3	0	3	6	5	14
Flowers/flower beds	0	0	0	3	1	0	4	1	1	7	2	1	10
Swimming pool	1	2	0	3	0	2	1	0	0	5	2	2	9
Community hall	0	0	2	0	2	3	0	1	1	0	3	6	9
Lights	0	3	0	0	1	0	1	2	1	1	6	1	8
Police post	0	1	1	0	0	0	0	0	5	0	1	6	7
School	0	1	3	0	0	0	0	0	3	0	1	6	7
Carwash	0	2	0	0	1	1	0	1	1	0	4	2	6
Library	0	3	0	0	0	0	0	1	1	0	4	1	5
Birds	0	0	0	1	0	0	3	0	0	4	0	0	4
Tarred road/parking	0	1	0	1	0	0	1	0	1	2	1	1	4
Youth centre	0	0	1	0	0	1	0	2	0	0	2	2	4
Educative bill boards	0	0	0	0	0	0	1	1	1	1	1	1	3

G-T- total mentions in all spaces

A Principal Component Analysis (PCA) was used to display the relationships between the preferred features with different green space types (Figure 4.4). The total variance accounted for by the first two axes of the PCA was 70.6 %. It clearly demonstrates that the type of green space has a strong influence on the various features respondents prefer in these spaces. More

specifically there is a high correlation between artificial elements (e.g. swings/play equipment, benches, flower beds, fencing, braai stands) with the formal green spaces indicating a high preference for these features by respondents. The need for trees and lawns within the formal green space is also indicated by a high correlation with the formal space (Figure 4.4). Within the informal green spaces, the need for sports facilities, playgrounds and lights had a strong correlation (Figure 4.4). For commonages, most respondents preferred they be developed for service provision features such as clinics, community gardens and schools.

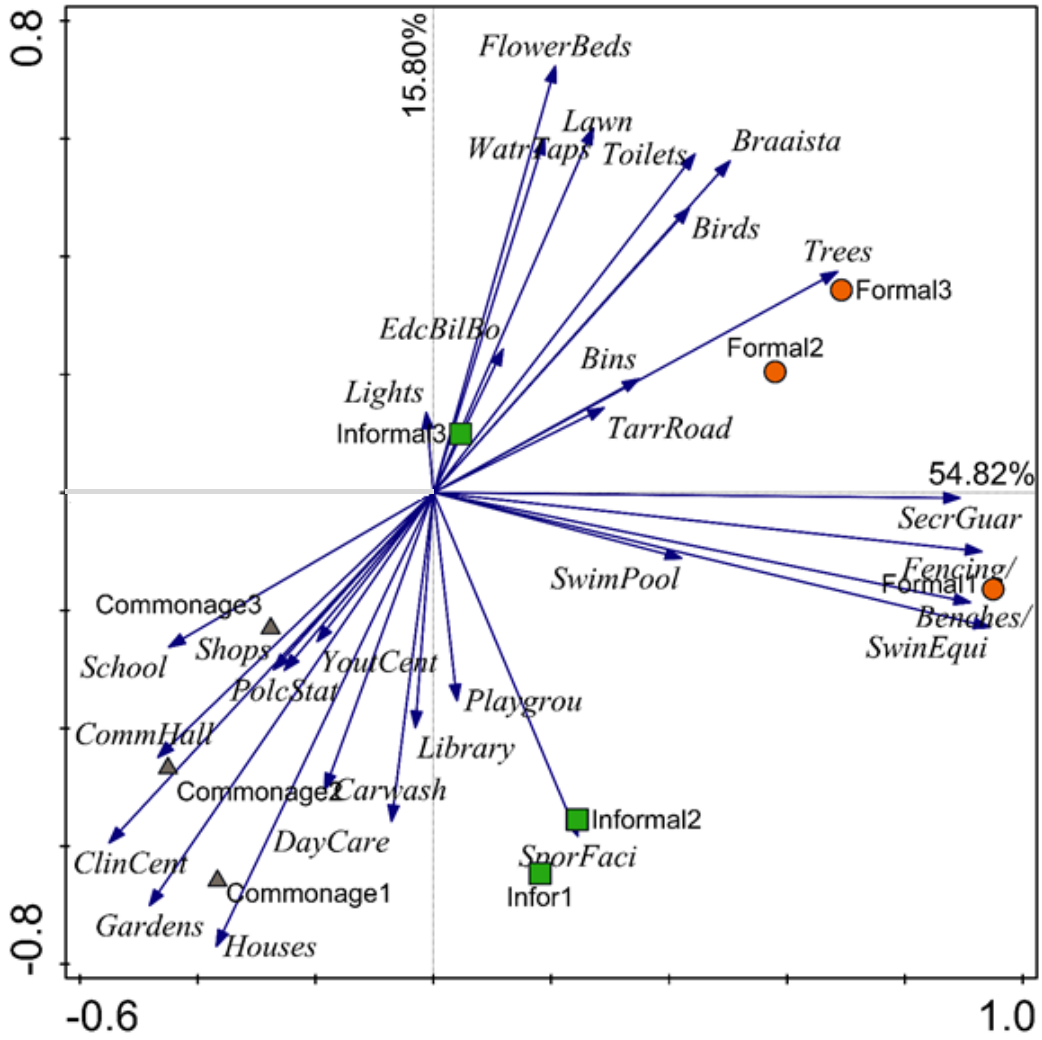

Figure 4.4. Principal Component Analysis (PCA) biplot illustrating the relationship between the preferred features (blue lines projecting from the origin, with long lines indicating stronger correlations than short lines) and type of green space.

4.4.5 Preferred appearance of green space

The respondents were shown four different images of urban green space types. Most of the respondents (73.1 %) preferred the open, formal green space (Figure 4.5) in the community; 23.9 % choose the green space that is treeless and contains swings and play equipment, and the informal green space with dense thicket was chosen by only 0.8 % (Table 4.5). The main reason for choosing (A) was openness and spaciousness (53.1 %) and safety (7.8 %), whilst the treeless play area (C) was chosen for equipment for children play (15.8 %) and safety (8.1 %) (Table 4.5).

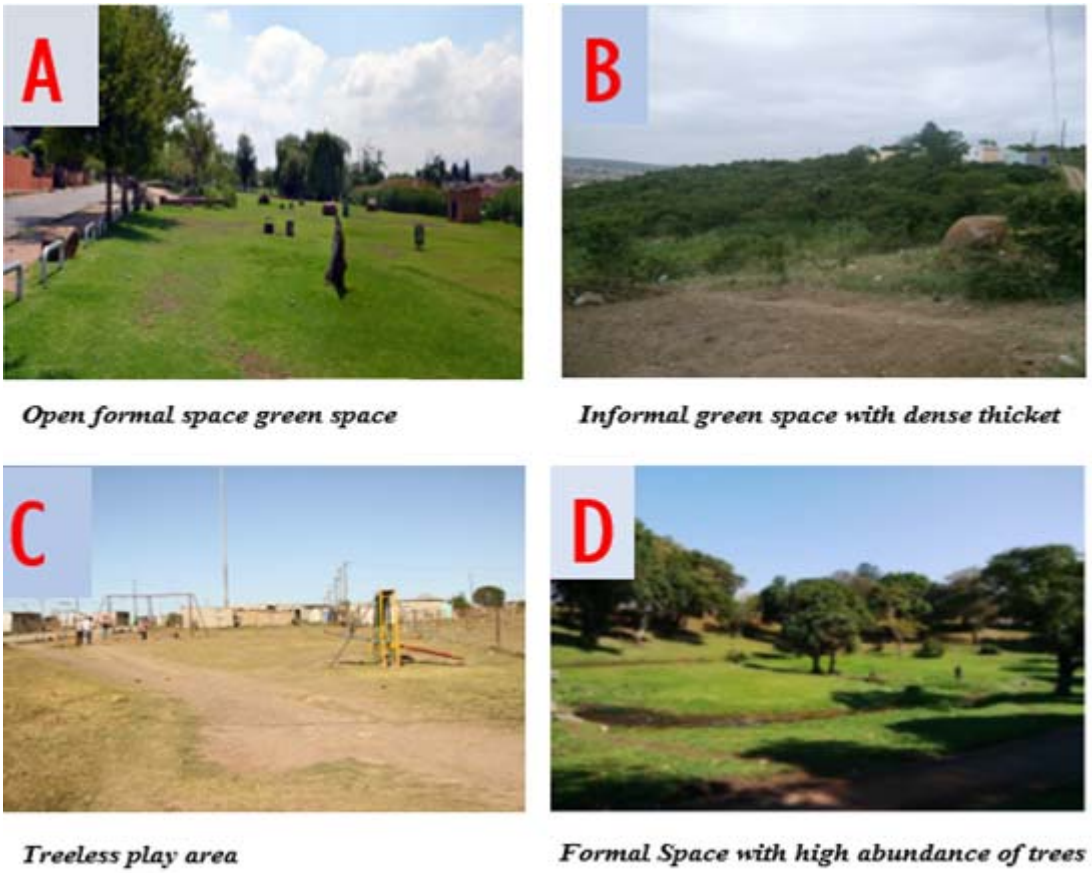

Figure 4.5. Photo choices offered to survey respondents to select which type of green space they preferred

Table 4.5. Reasons for the preferred appearance of green space

Type of green space	Frequency for type of space	Percent for type of space	Reasons for the choice	Frequency	Percent
A	263	73.1	Openness/Spaciousness	191	53.1
			Aesthetically pleasing	18	5.0
			Safety	28	7.8
			Presence of rubbish bins and braai stands	26	7.2
B	3	0.8	Fodder for livestock	3	0.8
C	86	23.9	Safety	29	8.1
			Swings/Play equipment	57	15.8
D	8	2.2	Forest setting	6	1.7
			Fodder for livestock	2	0.6

4.5 Discussion

4.5.1 Attitudes towards features within green spaces

The major findings of this study reveal that the presence of most natural features are mostly associated with informal green spaces and urban commonages. The presence of these features was associated with feelings of sadness and even fear among most respondents. The presence of dense pockets of understory growth and a thick shrub layer was perceived as prime spaces for criminals to operate and also offer a concealed space for them to hide in. These findings support those of Adegun (2018: p356) who concluded that trees and natural shrubby vegetation are perceived as unsafe for urban residents living in the informal settlements of Kya Sand, Johannesburg, in addition, a respondent cited that "The most fear we have is this river... Then the trees. The only thing you might fear is people hiding there and then coming to rob you. It does happen mostly that side towards those trees over there".

Similarly, Shackleton *et al.* (2015: p82) showed that at least one-third of respondents interviewed in Bela Bela and Tzaneen in the Limpopho Province, South Africa, mentioned that trees were "providing hiding places for criminals". Additionally, in literature from developed countries, Özgüner & Kendle (2006) suggest similar findings that demonstrate that natural areas are regarded as scary and uncomfortable by some urban dwellers. Bjerke *et al.* (2006) argue that perceived safety within urban green spaces decreases as the density of woody cover increases, corroborated by Laing *et al.* (2009) who asserted that more trees in urban green spaces reduce visibility and therefore make them feel less safe. On the other hand, Fuller *et al.* (2007) concluded that high plant diversity and density increases the positive fulfilment from

urban green spaces. Additionally, among 38 students in Michigan, United States of America, Berman *et al.* (2008) showed that cognitive performance was greater after students had walked through a tree lined arboretum in comparison with a busy city street lined with trees. This shows that the perceptions of the structural complexity of vegetation varies across different countries, cultures, socio-economic contexts and settings.

Some studies report higher incidences of perceived fear of dense vegetated spaces amongst women (Zhang *et al.,* 2013). This corresponds with findings from this study as more women expressed fear in visiting green spaces with dense pockets of vegetation much more than male respondents. The spatial arrangement of vegetation and its maintenance therefore impacts on the day to day lives of most women in this study. This corroborates the findings of Shackleton *et al.* (2015) who revealed that females were more likely to have phobia against the trees and shrubs within green spaces than males in two towns of South Africa, Bela Bela and Tzaneen. Despite, the natural dense vegetation being perceived to have a high restorative potential (Fuller *et al.,* 2007; Adinolfi *et al.,* 2014), this is untrue for most women interviewed in this study. In other studies in the Global North, women felt safe within green spaces (Özgüner, 2011). This was a function of visiting green spaces as a group rather than alone and the policing and surveillance that was available in some spaces, which is the opposite of the settings of the green spaces in this study.

Another finding was the feelings of disgust, displeasure and fear that come with the presence of livestock, specifically cattle, within the spaces. These negative feelings can be attributed to the destruction of vegetation by cattle, unsightly or smelly dung, endangerment to people within the spaces and in some instances, the attack of people by cattle as revealed by Chappel *et al.* (2015) in Grahamstown, South Africa. Besides, Louza (2007) found that the presence of stray animals annoyed athletes and scared children in urban parks whilst the presence of livestock within urban green spaces is considered a 'bad image' in Khartoum, Sudan, as livestock are smelly and sometimes attack people (Leenstra & Vellinga, 2010). Additionally, cattle may damage newly planted trees (Richardson & Shackleton, 2014; Shackleton *et al.,* 2017). Therefore, there is need for an effective livestock management plan within urban green spaces so that visitors can enjoy the space without problems, as confirmed by Davenport *et al.* (2012).

The negative features of the green spaces like high amounts of litter and anti-social behaviour within the spaces were found to evoke sadness, anger and disgust among respondents. This is

consistent with findings from early studies by Schroeder *et al.* (1984), who asserted that features like litter and graffiti decreased perceived security in urban green spaces, and hence potential park users would avoid the spaces. Adegun (2018) identified that vegetated spaces in Kya Sands, Johannesburg, are associated with potential disservices as households without proper sanitation facilities use the spaces as bush toilets thus, the spaces being disgusting as they smell horrible as one respondent noted. Additionally, O'Brien (2006) concluded that unmanaged urban green spaces brought about feelings of disappointment and disgust. During visits, groups of people were drinking alcohol and smoking, which might be intimidating for some potential visitors. Urban green spaces which lack visible management and have signs of anti-social behaviour deter people from visiting them (Adinolfi *et al.,* 2014).

According to the Victims of Crime Survey in South Africa, there is increasing fear of crime in public green spaces resulting in parents disallowing their children to play in public spaces (StatsSA, 2016). Despite this context, artificial features within the formal green spaces studied resulted in feelings of happiness for users. For instance, some respondents went on to explain how the play equipment within formal green spaces brought them happiness as their children can play in safe open spaces as opposed to playing in streets and roads. These findings are similar to other research that revealed that taking children to play in formal parks was associated with happiness among users (Swanwick *et al.,* 2003; Bertram & Rehdanz, 2015). In addition, Özgüner (2011) reveals how formal parks are considered as safe spaces for taking children to play. This is important because playing outside for children is good for their cognitive, emotional, psychological and physical growth and development (Thompson, 2008; Soga & Gaston, 2016). Within the context of this study, it is therefore important for attention to be drawn to the safety features and childrens' play equipment within the limited formal green spaces in the low-income areas (McConnachie & Shackleton, 2010), as they are spaces for the growth and development of children.

4.5.2 Preferred features within urban green spaces

The findings of the present work suggest that the design of the sampled green spaces does not conform to people's ideals and needs. Respondents preferred formal green spaces which have varied recreational facilities (e.g. benches, swings and play equipment, braai stands), open layout with well-lined trees, open lawns, clean and well maintained. This corroborates Shackleton & Blair (2013) who revealed that respondents within their study in the Eastern Cape, South Africa, preferred to visit other green spaces not in their suburbs because of

attraction to better quality and availability of various recreational amenities. Moreover, Zhang *et al.* (2013) concluded that seating was highly favoured in green spaces in Guangzhou, China, whereas Woolley (2006) showed that indeed, the visitation frequency was closely related with the number of seats within an urban green space. Bertram & Rehdanz (2015) strongly asserted that besides the presence of recreational features, cleanliness and open areas stand out as the most preferred characteristics in attracting visitors to formal urban green spaces. Additionally, Harris *et al.* (2018) argued that certain conditions like developing well-lined trees and better amenities would increase the attractiveness of any green space.

The highly preferred open layout (Fig. 4.5 Pic A) suggests that users prefer well-maintained green spaces with amenities for use, scattered trees and minimal understory. Turner & Mearns (2017) pointed out that visitors to local parks in Kempton Park, South Africa, preferred to visit green spaces which were well-maintained, with mowed grass and provided various amenities (e.g. benches, swings, outdoor gyms, braai facilities). Even more, in developed countries there is also preference for open landscapes in formal green spaces with scattered trees or well-lined with 'nice' flowerbeds and minimal understory (Bjerke *et al.,* 2006). However, Arnberger & Eder (2012) showed that few respondents favoured open landscapes corroborating Harris *et al.* (2018) who reported that lawn was negatively related to preference. Contrary to the findings of this study, studies in developed countries have shown increased preference for highly dense vegetation with minimal alterations (Fuller *et al.,* 2007; Gómez-Baggethun & Barton, 2013; Qui *et al.,* 2013). Moreover, Rupprecht *et al.* (2015) asserted that respondents in a study in Brisbane, Australia, and Sapporo, Japan, preferred shrubby and thick vegetation, which represented an unaltered, natural structure to them. Harris *et al.* (2018) also revealed that dense vegetation within green spaces was preferred for its ability to provide habitat for wildlife.

The findings also showed high preference for a security via guards and fencing within the formal green spaces. Safety was highlighted as very important when choosing preferred spaces (Zhang *et al.,* 2013; Adinolfi *et al.,* 2014; Shackleton *et al.,* 2015). This is consistent with findings from a low-income area in Bari, Italy, where respondents highlighted the need for a green space with increased surveillance and policing (Sanesi & Chiarello, 2006). Gobster (2002) also showed that a greater percentage of users of Lincolin Park, which is Chicago's largest and most heavily used park, preferred a formal green space with brighter lights and increased policing to feel safe within the space. However, despite fencing being a preferred measure to ensure safety for children playing within green spaces close to busy roads, Adinolfi

et al. (2014) suggest that it might actually deter visitors as it can appear as a barrier for those who want to visit and those who want to use the spaces as pathways for transit.

Interestingly, respondents suggested that all the vegetation within the informal green spaces and urban commonages should be removed and the spaces should be used to construct service facilities like clinics, schools, libraries and community halls. This suggests that the present vegetation does not conform with their needs or the design brings about disservices as compared to the benefits. Moreover, it also suggests that informal green spaces and municipal commonages are not zoned as recreational parks thus, people see them as undeveloped land, which should be developed. This follows the work of Adegun (2018) were one respondent suggested "the solution is to burn these trees, those bushes there, so people can walk freely anytime…..". This is similar to previous work done in the developed countries that show that preference is determined by the context and spatial arrangement of the vegetation (Jorgensen *et al.,* 2002; Bjerke *et al.,* 2006; Harris *et al.,* 2018). Variation in preferences of woody and non-woody plants also influence the type of vegetation (e.g. trees, shrubs, herbs), the neatness of the vegetation, vegetation colour and the textures of leaves found in the green spaces (Williams & Cary, 2002; Jim & Chen, 2006; Kendal *et al.,* 2012). In addition, the need for various service facilities in place of vegetation conforms with Maslow's Hierarchy of Needs Theory (Maslow, 1943). This theory suggests that people have the dire need to have basic needs like food, water, warmth and safety first before psychological and self-fulfilment needs. In the context of this study, people prioritize their present safety needs which are reflected in the perceived risk of crime within informal green spaces and urban commonages because of the spatial arrangement and density of vegetation before other benefits that are offered by features within green spaces.

4.6 Conclusion

The study offers a general understanding of people's attitudes and preferences regarding the artificial and natural features within different types of urban green spaces in one of the poorest provinces in South Africa. In particular, an emerging sense of strong negative feelings towards natural features in the informal green spaces and municipal commonage can be noted in the study. This suggests that the current design and infrastructural components within the studied urban green spaces does not contribute to well-being and quality of life as much as they could. Specifically, the various psychological benefits linked with being in contact with nature are poorly attained by people within the low-income areas of the Eastern Cape, South Africa.

However, the study suggests that if the green spaces are planned, constructed and maintained effectively in a way which caters to people's needs, then the presence of woody and non-woody plants is favoured. Moreover, the artificial components of the green spaces are limited, unavailable or of poor quality, therefore these features only result in green spaces being associated with negative sentiments. In light of these findings, there may be opportunities for urban planners and designers to incorporate the needs and preferences of people in the creation of sustainable urban green spaces. The urban planners should reflect on these findings to improve or create urban green spaces that enhance the quality of life for users. Vision sharing and consensus building in the community for city planning would be more constructive if supported by the evidence from this study.

CHAPTER 5

SYNTHESIS OF KEY FINDINGS, RECOMMENDATIONS AND CONCLUSION

5.1 Chapter overview

This chapter positions the findings of this study in the broader development nexus and considers their policy and transformative implications upon the future planning of urban green spaces in the low-income suburbs of South Africa. Firstly, major findings from the empirical chapters (Chapter 3 and 4) are revisited to integrate and synthesise insights towards the research objectives. The chapter is structured according to four core propositions that emerge from the research findings. Based on these propositions, I posit that the features within urban green spaces influence the reasons for visiting these spaces and consequently impacts the attitudes that people have towards these features and urban green spaces generally. In the second part of this chapter, I pay particular attention to how the findings of the study relate to the current planning of urban green spaces in South Africa, presenting possible implications and where applicable, recommendations to developing future urban green spaces which offer a better quality of experience and well-being for urban dwellers. Overall, this synthesis provides the background to lead into a more practical consideration of the implications of the findings for better planning of urban green spaces which represents people's ideals and needs.

5.2 An integrated picture of urban dwellers' attitudes towards features within urban green spaces: synthesis of core propositions

The overall aim of the research was to investigate the composition and quality of features within urban green spaces and examine the attitudes and preferences towards features in South African urban green spaces (Section 1.8.1). The first research objective was to *evaluate the quality of features within urban green spaces and understand reasons for visiting urban green spaces.* From the empirical findings in Chapter 3, the following propositions can be made:

1. Different types of urban green spaces and features therein are heterogenous in nature and have various attributes and qualities.
2. The reasons for visiting urban green spaces are dependent on the type of green space, as well as its structural and functional attributes.

The second research objective was to *explore user attitudes and preferences towards features within urban green spaces.* From the empirical findings in Chapter 3 and 4, the following propositions emerge:

3. The composition and quality of features within urban green spaces influence people's attitudes towards urban green spaces.
4. Urban dwellers prefer urban green spaces which provide their immediate needs and ensure their personal safety.

5.2.1 Proposition 1: different types of urban green spaces and features therein are heterogenous in nature and have various attributes and qualities.

Chapter 3 demonstrated that formal green spaces generally had low tree, and herb cover but with high lawn cover. On the other hand, informal green spaces and commonages had relatively high tree, shrub and herb cover. The vegetation in all the green spaces was rated as being of poor quality based on observations conducted and attitudes of users. Therefore, it was evident that the spaces are heterogenous. Such findings are consistent with work done by Graca *et al.* (2018) who identified that urban green spaces are heterogenous as they are composed of various features which deliver different ecosystem services and offer varied benefits. Poor quality of green spaces was also reported by Sanesi & Chiarello (2006) in Bari, Italy. Their results revealed that residents rated their green spaces as having poor vegetation of insufficient quantity and quality. This highlights that within each type of green space there are different functional and structural attributes which make each space unique and thus offer different functions and uses, ultimately affecting its appeal to different users (see Section 3.5.2). The varied findings in this study suggest that the structural and functional attributes of any urban green space vary across different countries and cultures. For instance, common findings from the Global North show that formal green spaces are typically well endowed with trees, herbs, shrubs and manicured lawns (Chiesura, 2004; Fuller *et al.,* 2007; Palliwoda *et al.,* 2017) whilst evidence from this study departs from such. Moreover, evidence from the Global North shows urban green spaces as containing vegetated spaces without further emphasis on the quality of the vegetation. It is therefore necessary to not only describe the composition of the green spaces but also to look at the quality of features contained to understand people's attitudes towards such green spaces (see Section 4.5.1).

Furthermore, the study demonstrated that some formal and informal green spaces were the only ones with some recreational facilities supports. However, these were mostly of poor quality as

many of them were vandalized. This further supports the first proposition in that different types of green spaces vary in their composition and structure. Similar to these findings, Njwaxu (2015) reported a high degree of vandalism of signage, seats and play equipment in other formal green spaces of the Eastern Cape. This is in stark contrast with recreational facilities in urban formal green spaces of the developed world, where multiple recreational facilities, like sports grounds, gym facilities, benches and shelter, are found in sufficient quantities and of generally good quality (Özgüner, 2011; Betram & Rehdanz, 2015). This highlights that the formal green spaces within the study context fall short to offering diversified recreational activities. In addition, observations in the study showed that the recreational facilities available are mainly suited for children whilst formal green spaces have been linked with catering for all age groups and different gender groups (Chiesura, 2004; Shan, 2014; Betram & Rehdanz, 2015). Evidence from the study also showed complete absence of recreational facilities in the municipal commonages. This is an indication that these spaces are not zoned for recreational activities, despite the study revealing that people in fact do utilize these spaces for such purposes (see Chapter 3, Figure 3.5). Thus, the current planning of the green spaces in the study context reveal that these spaces do not offer sufficient opportunities for people across all age groups and genders to partake in multiple activities within the spaces. This is likely to have detrimental implications for the well-being of the people within low-income areas, because the closest green spaces do not adequately support outdoor recreation and relaxation, which can underpin community cohesion and social interaction (Özgüner, 2011; Peters *et al.*, 2010).

5.2.2 Proposition 2: the reasons for visiting urban green spaces are dependent on the type of green space and structural and functional attributes of the space.

It is evident from the findings that the reasons for visiting urban green spaces were dependent on the available features (see Section 3.5.2). More than 90 % of the respondents cited passing through the green spaces as the dominant reason for visiting. This highlights the availability of the most convenient routes (i.e. desire lines) across these green spaces which were deliberately established by people as paths which lead to different destinations like the shops, schools, clinics and major routes. This is similar to findings from Chen *et al.* (2016) who reported that urban green spaces are used as places for transit usually on paved walkways and footpaths. However, this study departs from Chen *et al.* (2016) findings as within the study context, the footpaths were on bare ground without any paving or maintenance. In addition, along these desire lines piles of rubbish were observed which in turn reduces the attractiveness of the green spaces (see Figure 3.2). Even more, findings depart from common findings in the Global North

where people visit the green spaces for longer time for recreation and well-being (Chiesura, 2004, Fuller *et al.*, 2007; Palliwoda *et al.*, 2017). Consequently, the clear neglect of these green spaces impacts on the various activities that people do in them. Thus, the studied green spaces do not effectively cater for people's needs particularly when there are weather extremes, for instance when it is raining. Moreover, according to Bruinders (2018, personal comm) the use of these green spaces for transit is because most people are on foot to work and they do not afford the costs associated with other means of transport. Usually, most people arrive at work in dirty shoes and their dignity and self-worth is undermined. Also having to walk through such messy places is also undermining and does not help to facilitate all the more positive psychological benefits that can be accessed by walking (Bruinders, 2018 personal comm).

Van Herzele & Wiedeman (2003) reported that the frequency and duration of visits to urban green spaces stems from the availability of aesthetic features and the general maintenance and upkeep of the spaces. This study found that the limited recreational facilities (see Table 3) within formal green spaces limited the activities that people could potentially partake in, thus supporting proposition 2. This mirrors Shackleton & Blair (2013) who reported that residents of the two Eastern Cape towns deemed that the public green spaces available in their immediate area had limited amenities, and thus some travelled to other suburbs to access what they deemed better quality and quantity of amenities. Thus, urban planners and local authorities within the studied towns need to prioritize the maintenance and upgrading of the available green spaces so as to address the shortages and offer diversified activities for people. Furthermore, the local authorities need to take into account the fact that people use informal green spaces and commonages for various purposes like relaxing, appreciating nature and collection of various plants. This highlights the potential of informal green spaces and commonages in providing alternative outdoor areas for relaxation and recreation.

Jarvis *et al.* (2009) identify that men and women experience city living differently. The findings of this study indicate to that males and females used the green spaces for different purposes, yet, observations from the study (i.e. the use of municipal commonages was restricted to only males for initiation ceremonies) and perceptions from respondents reveal that local authorities have not factored in the element of gender in green space planning. This is also true for the role age plays in use of green spaces. Evidence from the study showed that most formal green spaces were equipped with mostly play equipment for children. In addition, the youth and middle-aged partook in most activities within the spaces in comparison to the elderly people (see Table 3.3). This departs from findings from the Global North which show that formal

green spaces are usually created to cater for all age groups, for instance to provide play equipment for children (Swanwick *et al.*, 2003), gym facilities for the youth, middle aged and elderly (Shan, 2014) and providing seating areas and shelter for the elderly (Chiesura, 2004). This highlights the shortcomings of the planning of the spaces within the low-income areas of the Eastern Cape. It is important to reflect on the implications of these shortfalls for the well-being and quality of life for people living around these areas.

5.2.3 Proposition 3: the composition and quality of features within urban green spaces influences people's attitudes towards urban green spaces.

Evidence from this research shows that respondents had mostly negative feelings towards the vegetation within the green spaces, particularly within informal green spaces and municipal commonages. This clearly shows that the composition, in this case vegetation, influences people's attitudes towards urban green spaces (Adinolfi *et al.,* 2014; Adegun, 2018). Specifically, it was found that the feelings of fear, sadness and anger were evoked when people were prompted on how they felt about the vegetation in the green spaces next to their homes. This suggests that the poor quality of vegetation with regards to the structure and composition resulted in people having negative perceptions towards it. Such negative attitudes towards urban green spaces support findings by Adegun (2018) who found that trees and natural shrubby vegetation evoked fear for urban residents living in the informal settlements of Kya Sand, Johannesburg. This implies that the spatial arrangement and quality of vegetation within the study context as revealed in Chapter 3, does have negative impacts on the quality of life of urban dwellers.

However, it is important to note that it is hard to tease out vegetation structure and composition and its quality. Thus, the study suggests that the lack of maintenance of the vegetation therefore evokes negative feelings. Moreover, previous work in South Africa (Chinyimba, 2012, Gwedla & Shackleton, 2015:2017) reported that people appreciate nature and trees but not if it is neglected which departs from the usually well-kept vegetation within urban green spaces in the Global North. Therefore, one key highlight that emerges from this research concerning attitudes towards vegetation within urban green spaces is that it matters 'whose eyes we use' when considering the attitudes towards vegetation within urban green spaces. Evidence from this study departs from existing literature from the Global North which depicts that vegetation within urban green spaces is associated with positive psychological benefits and increase in cognitive performance (Chiesura, 2004; Fuller *et al.,* 2007). Considering this, a 'context-

specific lens' toward attitudes should be adopted in-order to understand the full potential that vegetation within urban green spaces contributes in the lives of urban dwellers in promoting quality of life and well-being. This further supports the motive of this study, that context specificity is necessary to understand attitudes and preferences of people with regards to features within urban green spaces, and even further to understand it from a country with a unique historical legacy which has controlled how towns and cities are planned ultimately affecting the distribution of urban green spaces across different suburbs. Thus, context specific attitudes are to be adopted if the full potential of urban green spaces with regards to benefits and services people acquire from them are to be realized.

The feelings of displeasure, disgust and fear that arose from the presence of high coverage of litter, anti-social behaviour and presence of livestock (see Section 4.4.3), are also important findings that emerged from this study. The high litter coverage within the spaces was strongly reported as one of the major deterrents in visiting green spaces for both users and non-users of the spaces. This is consistent with Van Herzele & Wiedeman (2003) who point out that certain preconditions exist which influence the use of urban green spaces. Applying a 'context-specific lens' in this study, certain aspects which pertain to the management of the green spaces were not met, these are inclusive of the lack of maintenance, arrangement of vegetation and evidence of anti-social behaviour. Such findings corroborate existing literature that asserts that urban green spaces which lack visible management and have signs of anti-social behaviour often result in people having negative attitudes towards them (Schroeder *et al.,* 1984; O'Brien, 2006; Adinolfi *et al.,* 2014). Therefore, this study supports, or at least acknowledges, that lack of proper management of the green spaces results in limited use of the space (see Section 3.4.4) and people generally viewing urban green spaces as places which offer a lot of disservices instead of positive benefits which can contribute to the quality of life and well-being of people. Thus, there is need for pro-active planning and enhancing management in terms of providing recreational equipment, planning and better maintenance of the green spaces with regards to provision of rubbish bins, and better upkeep of the places.

5.2.4 Proposition 4: urban dwellers prefer urban green spaces with features which represent their immediate needs and ensure their personal safety.

The results from this study show that Proposition 4 which argues that urban dwellers prefer urban green spaces which represent their immediate needs and ensure their personal safety to be largely true. The study revealed that most respondents preferred well laid out urban green

spaces which has features like benches, swings and play equipment, stand-alone trees and open or manicured lawns (see Table 4.5). It was evident that the available green spaces had limited recreational facilities and lacked management, thus many local residents did not engage in multiple activities within the spaces (see Section 3.4.4). This is corroborated by Shackleton & Blair (2013) who pointed out that respondents in two towns in the Eastern Cape, South Africa, would prefer to visit green spaces elsewhere because of to better quality and availability of various recreational amenities. Thus, it could be argued that urban planners should take cognizance of people's needs and uses of urban green spaces and maintain, build and provide urban green spaces which suit the current needs of the people.

This study also supports previous works (Jorgensen *et al.,* 2002; Bjerke *et al.,* 2006; Adegun, 2018) showing that people prefer to visit urban green spaces where they feel safe and are not at risk of crime. Respondents in the study mentioned the need for security guards and fencing of the green spaces so as to feel safe and protected when they are visiting. This is consistent with findings by Sanesi & Chiarello (2006) who revealed that green space users in Bari, Italy, preferred a green space with increased surveillance and policing. In addition, the variation in the preference of vegetation in this study clearly correlates with people wanting to feel safe within the green spaces as within the study context the shrubby vegetation was considered to be a place for concealment for criminals. Thus, people preferred open, laid out vegetation, particularly for safety reasons. This emphasizes the importance of personal safety when visiting urban green spaces, thus supporting the fourth proposition posed for this study.

This study has also demonstrated that the needs and preferences that people have for urban green spaces are context specific. In Chapter 4, several respondents cited that they would prefer that the land which is currently described as informal green space and municipal commonages be cleared and clinics, schools, libraries and community halls built. This highlights that there is a high need for these services instead of what the land is currently being used for. In the case of South Africa, this can be attributed to the current shortage of housing within towns and cities and also the limited availability of public service facilities like clinics and schools (Charlton & Kihato, 2006; Moroke, 2009), thus respondent's priority is to have shelter in comparison to land being undeveloped. As mentioned in Chapter 1 (section 1.2.1.1), to draw practical implications of the research findings, it is important to understand the context in which people live in to fully comprehend their interactions with nature and other features within urban green spaces.

5.3 Practical implications of research findings

The current nature of the features available within public green spaces in the low-income areas of South Africa has important implications with respect to the quality of life and well-being of urban dwellers. At local level, municipal managers, town and urban planners and designers need to take cognizance of the various values that people place on features within urban green spaces. The functions of urban green space for the local urban population needs to be clear, as is confirmed by Schipperijn *et al.* (2010: p31): "It is necessary to have a good insight in who the neighbourhood residents are and what their wishes and preferences are, as well as an insight in how other green spaces in the neighbourhood look and which possibilities they offer". This research has shown that to facilitate positive sentiments towards features within urban green spaces, it is crucial to consider the following practical aspects:

- Knowledge of the age, gender and other socio-economic attributes of the local residents that do not use, or wish to use urban green spaces,
- What features, and amenities are provided and the ways they are used,
- The maintenance and upkeep of available green spaces,
- Availability and user preferences with regard to landscape features, size and amenities,
- Effective consultation of local residents on the local needs with regards to green space planning.

This study offers concrete insights into how the composition and quality of natural and artificial features shapes people's attitudes towards these features. Such insights have been used to consider practical recommendations for municipal planners to consider when planning the urban green spaces in the low-income areas of the Eastern Cape, South Africa (Section 5.3.4). If the needs of the people staying around green spaces are considered and if a consensus is reached and incorporated into planning of these spaces, an improved quality of life and well-being of people is likely to be achieved. Below the key practical implications are described.

5.3.1 Understanding the functions of each type of urban green space relative to the features it contains

To improve how people use urban green spaces it is important to recognize that different green spaces contain different features (Haase *et al.,* 2014; Botzat *et al.,* 2016). This can be achieved by adopting the results of this study as it is evident that formal green spaces, informal green spaces and commonages have different landscape features which serve different functions. Following from the current study, it is proposed that some sections of informal green spaces

and commonages should be equipped with various recreational amenities because some residents are already using these spaces for activities which they were not zoned for. The addition of such areas will increase spaces for outdoor recreation. On the other hand, it is important to recognize that most respondents suggested that the informal green spaces and municipal commonages be used for other land uses like building clinics, schools and community halls. Thus, the municipality should understand the needs of the people so as to avoid conflicts and continuous vandalism of public parks as one of the recognized reasons for such acts is that the local municipality does not consult people with regards to development projects in their areas (Njwaxu, 2015).

5.3.2 Planning for a diversity of users

Age and gender play a role in how people use urban green spaces (Chiesura, 2004; Shan, 2014). Elderly people are more prone to visit green spaces for opportunities of contemplation (Chiesura, 2004). However, this study shows that the young people, middle-aged people and the elderly participated in different activities when visiting the green spaces (see Section 3.4.4). In addition, Shan (2014) showed that gender influences who will visit the green space and for what reason. This was similar to some findings of the study as it was clear that women were more inclined to take part in the consumptive purposes in the spaces as opposed to men who would just relax and seek inspiration in the spaces (see Table 3.3). Therefore, the planning of future urban green spaces within the South African context should incorporate how different personal attributes influence the use of the green spaces, particularly because men and women and other minority groups experience city life differently (Jarvis *et al.*, 2009).

5.3.3 Managing for cleanliness and safety as key priorities

In South Africa, the issue of crime within public spaces is a social ill which affects mostly people in urban areas (StatsSA, 2016). Most respondents in the study felt unsafe within the green spaces and there was fear of crime within the spaces. Respondents reported that the thick vegetation was difficult to see through and acted as a place to conceal criminals, which made people afraid to visit or send their children to play unattended. Safety concerns were also related to the lack of maintenance of the green spaces which annoyed many green space users. Grievances about the high coverage of litter, the presence of cattle and sewerage in some instances deterred users. This suggests a missing potential of urban green space as better perceived safety will increase user intensity for various visitor groups, children as well as women and elderly. This issue should be addressed by municipal managers by making an

inventory of the most mentioned sites which act as hide outs. Within these spaces, maintenance and security issues can be improved for the full benefit of users by residents, park users and the community at large.

5.3.4 The need for participation and consultation in design of urban green spaces

To cater for people's needs and ideals with regards to preferences for features within urban green spaces, it is important to thoroughly consult them and understand their perceptions and attitudes. As reported by Gwedla & Shackleton (2015), there needs to be communication among different scales of authorities to understand the issues hindering the non-provision of urban green spaces with adequate facilities and spaces which represent people's needs. Local residents need to be consulted to avoid issues such as vandalism and lack of belonging to available features in their green spaces, thus assumptions before any planning and building of green spaces should not happen. Local residents should fully participate on the decision-making process of the features they need within different green spaces so that it can be established whether they want trees or not, the types of recreational and they want, and where they would like the different features to be placed. An update of peoples' preferences also needs to be done regularly as preferences change over time, together with changes in urban cultures, leisure time activities and environmental knowledge (Tyrväinen *et al.,* 2007). In situations where new residential suburbs are being developed, initial planning and development need to include people's views and needs rather than incorporating it after development has taken place. This can be done by putting place measures which allow effective communication between town planners and local residents of a certain place. In addition, use of communication tools such as information, consultation, and public participation are crucial to reduce or avoid conflicts between residents, planners, and managers (Eriksson *et al.,* 2012). Furthermore, public consultation and participation require financial resources (Gwedla & Shackleton, 2015). As such, the government should prioritize funding of initiatives in low-income areas which seek to maintain, improve and achieve better urban green spaces.

5.4.5 Contribution to literature on urban green spaces within the South African context

This research has also made an important contribution to the international discussion of how particular features of green spaces contribute to the liveability of towns and cities. As noted in Chapter 1, there is an increase in urban people globally seeking outdoor spaces to relax and recreate among other uses. However, most literature on the attitudes, experiences and sentiments of urban green space users comes from a Global North perspective. As discussed in

Chapter 3, there is a contrast on the available green space features in this study as compared to most literature in the Global North. This is illustrated by the different landscape features within the studied green spaces, for instance, limited trees, shrubs and herbs in formal green spaces in comparison to the urban green spaces in the developing countries which are usually described as containing more trees, flowers and small animals. Chapter 4 revealed strong negative sentiments towards the shrubby and dense vegetation within the green spaces, which is generally is opposite to literature from the Global North that reports most experiences in urban parks with higher species richness and vegetation cover being positive (Fuller *et al.,* 2007; Adinolfi *et al.,* 2014). As noted by Botzat *et al.* (2016) to further develop sustainable green spaces for all, there is a desperate need for more context-specific studies across the world so as to refine understanding of how people relate to features within urban green spaces from a developing country context with different historical legacies. This study provides an example of how region-specific studies can contribute towards obtaining a better understanding of the scope of the new strategies to planning of urban green spaces.

5.4 Conclusion

In South Africa, historical and political processes have emerged as a strong factor in shaping current city and town planning. The study reveals that whilst certain perspectives with regards to urban green spaces planning can be transferable from the Global North to the developing world, several researches requiring context specific research still exist. Consequently, a 'context-specific lens' must be applied to understand how people interact with features within urban green spaces to cater for different cultures and socio-economic factors. For example, within South Africa there is a limited literature on how people of different cultures, race, gender and age interact with features within urban green spaces. There is no literature published, to the authors knowledge, on the composition and quality of features; attitudes towards features within green spaces and preferences for the key features to be included in the design of ideal green spaces for urban dwellers staying in low income areas of South Africa. It is therefore, hoped that this study provides a starting point in knowledge creation within this field of urban ecology in South Africa.

As a closing note, it is important to remember that many scholars have argued for a new type of urban science (Alberti, 2017; Acuto *et al.,* 2018), which seeks to shape the emerging research agenda within urban areas. Thus, framing theoretical perspectives and agendas need to better reflect the actual plurality of contexts from the Global North and South. The quality of life and

well-being of urban dwellers within the Global South provides a fertile ground for new theory and analytical approaches (Nagendra *et al.,* 2018). The knowledge gaps are many, including on alternative scalable solutions to sanitation, transportation, and within the study context, potential of urban green spaces to offer a better quality of life and well-being for urban dwellers. This is a knowledge gap that I hope I have contributed to in this study and is a matter that all of people working at the human-nature interface within urban areas need to keep at the forefront of thinking and analysis.

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APPENDICES

Appendix 1

Checklist used for assessment

Observation Checklist

Town/Suburb……. Green Space Type……

Urban Park Feature	Presence Yes/No	Number/ % cover	Description
Naturalness *(percentage cover 0 to 100%)*			
Presence of open lawn at ground level			
Dense/thick understory herbaceous layer (<0.5m in height)			
Dense bush layer (between 0.5m and 2m in height),			
0-10 trees present (all vegetation >2m in height)			
High density of trees,			
Environmental Quality *(rating from 0-100%)*			
Noise level			
Cleanliness			
Crowdedness			
Landscape Quality Reservoir, river			
Seating area			
Lighting in the space			
play equipment			
Shaded areas			
paved walkway			
Rubbish bin			
Ablution blocks			

Recreational facilities (braai stands, taps, sports facilities)			
Safety			
anti-social behaviour (smoking, drinking, gang)			
Hawkers			

Legend:

1. Not at all – not present

2. Poor – present but inadequate and not in good condition

3. Adequate - present; acceptable

4. Good - present; satisfactory

5. Excellent – present, more than enough and well maintained

Appendix 2

RHODES UNIVERSITY
Where leaders learn

department of environmental science

SURVEY OF URBAN DWELLERS, 2017

RESEARCH PROJECT TITLE: How do urban dwellers identify with features within urban green spaces?

You are invited to participate in a survey as part of my MSc research seeking to understand how urban dwellers identify with features within urban green spaces.

Your participation in this study is completely voluntary. If you agree to participate you are also not obliged to answer all questions and are free to withdraw from the survey at any point. Your survey responses will be kept strictly confidential. Your information will be coded and your identity will not be made known to others through my research and writing.

If you have questions about the survey, please contact the researcher, Amanda Manyani, at amy.t.manyani@gmail.com , or my supervisor, Prof Charlie Shackleton and Prof Michelle Cocks in the departments of Environmental Science and Anthropology at Rhodes University, at c.shackleton@ru.ac.za and m.cocks@ru.ac.za or by phone at 046 603 7001.

GREEN SPACES VISITATION AND FREQUENCY OF ACCESS

1. Do you visit/ pass through any of the open/green spaces near your home?

[ ] Yes [ ] No **IF NO, SKIP TO Q 17**

2. Which means of transport do you usually use to visit/pass this open/green space?

[on foot] [bicycle] [car] [public transport] [other]

3. How long does it take you from your home to reach this open/green space?

[less than 5minutes] [5min to 15minutes] [15min- 30minutes] [30min-60minutes]

4. How often do you visit/pass the open/green space?

[daily] [multiple times/week] [once/week] [1-2 times/month] [every few months] [rarely]

5. When do you visit/pass the open/green space?

[any day] [weekends] [weekends/holidays]

6. What time of day do you often visit the open/green space? (multiple answers possible)

[morning] [afternoon] [evening] [anytime]

FEATURES/ELEMENTS OF GREEN SPACES

7. When in the open/green space what are the **FIVE** features you notice in order of importance?

Interviewer to probe the respondent, the question wants that which stands out whenever the person is in the space. Do not read answers.

Open space	Flowers
Livestock	braai stands
Litter	Benches
Bushes	swings/play equipment
Patches of green grass	Firewood
Trees	Birds
The presence of other people	Children playing
Sports facilities	Other, *specify*……..…..…..…..…...

8. How does the presence of these features make you feel?

Feature	Feeling
1.	
2.	
3.	
4.	
5.	

9. If any of these **five** features were removed, how would you feel?

Feature	Feeling
1.	
2.	
3.	
4.	
5.	

10. If you were to be given a task by the municipality to design the open/green spaces in your suburb, please **MENTION FIVE FEATURES** you would put in the open/green space near your home?

F1……F2……F3……

F4……F5……..

12. ***In the next question, I want to understand your feelings and perceptions about the presence of specific elements.***

Would your feelings be enhanced or reduced if the following specific types or different types of elements were available? Answer yes/no and then give reason for answer.

Specific Type of	***Yes***	***Why?***	***No***	***Why***	***Lots of different types***	***Yes***	***Why?***	***No***	***Why?***
Trees									
Birds									
Butterflies									
Insects									
Grasses									

13. In the next question, I am going to read statements about various features, attributes and functions of the open/green space close to your home. Please indicate how much you agree/disagree with each statement?

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Don't Know
There is a wide diversity of trees in the green space						
The green space offers the only forest like setting close by						
The green space offers the space and freedom to enjoy nature						
The green space is neglected, abused and damaged, or vandalised						
Some features in the green space make the area feel dangerous and threatening to me						
The green space is an area that is peaceful and quiet						
The green space is an area with good amenities for play/ hobbies (fields, equipment)						
The green space is a tip and only attracts bad behaviour						
The trees in green spaces offer fresh air						
The grasses in green spaces offer good feed for our livestock						
The green space is used for some traditional ceremonies						
Some plants in green spaces are used for important traditional practices						
There are no attractive trees, grasses, flowers in the green space						
The combination of natural elements in the green spaces brings happiness.						
The green space offers a good environment and facilities for children to play						

ACTIVITIES DONE IN GREEN SPACE

14. I would like to know if you spend the time doing the following activities in the open/green space near your home.

Activity	Yes, open/greenspace close to home	Yes, why?	No,	Why not?	Is it something you would like to do?	If not in greenspace close to home, where?
Just walking through the space						
Spending time relaxing with friends and family						
Exercise (sports/jogging/)						
Traditional purposes						
Taking a break from the noise of the town						
Getting some fresh air						
Enjoying the aesthetic beauty						
Collecting firewood /fruits/ medicines						
Herding livestock						
Getting inspiration						
Braaing						
Community drama's, meetings, events						

In the next question, I am going to show you photos of various open/green spaces in other areas. I want you to tell me which one you would rather visit and why?

15. Photo chosen……

16. Why?

.....
.....
.....

If No to Q1

17. Do you visit any other green spaces in town or outside the town?

[ ] Yes [ ] No **IF NO, SKIP TO Q20**

If Yes to Q17

18. Why do you favour this open/green spaces over the green spaces within your suburb?

……
……
……
……

19. Are they any particular features of the open/green spaces within your suburb that can be improved or added to make more likely to visit ?

……
……
……
……

If No to Q17

20.What makes you not visit open/green space? Please explain?

……
……
……
……

21. Are they any specific features of open/green spaces that you make you not visit them?

……
……
……

22. If the features in the open/green spaces you mentioned above were maintained on a regular basis would you then visit them?

[ ] Yes [ ] No [ ] Don't know

23. If no, why?

……
……

Hypothetically, if you were to visit any open/green space. I want you to tell me which one you would choose to visit among these three pictures why?

24. Photo chosen……

25. Why?

.....
.....
.....

Personal Background

26. Gender: [ ] Female [ ] Male

27. Age: ……

28. What is your highest level of education? ……

29. Are you employed, what is your occupation? [ ] Yes [ ] No …….

30. What is the main source of household income?

[ ] Salary/Wage [ ] Social Grants [ ] Remittances [ ] Selling goods [ ] Other

31. What is the estimated household income per month?

[ ] Less than R1000 [ ] R1000-5000 [ ] R5000-10000 [ ] Above R10000

32. As a child, did you play in open/green spaces regularly? [ ] Yes [ ] No

33. How far away is the closest open/green space from your home?

[ ] Less than 100m [ ] 100m-500m [ ] 500m-1km [ ] 1km-2km

34. How long have you been living in this suburb? ……

35. Where did you grow up?

[ ] Town [ ] Township [ ] Farm [ ] Village

36. What is your home language? …….

ENkosi, Thank you for participating in the survey, any questions and comments are welcome!!!!!!!!!

Appendix 3

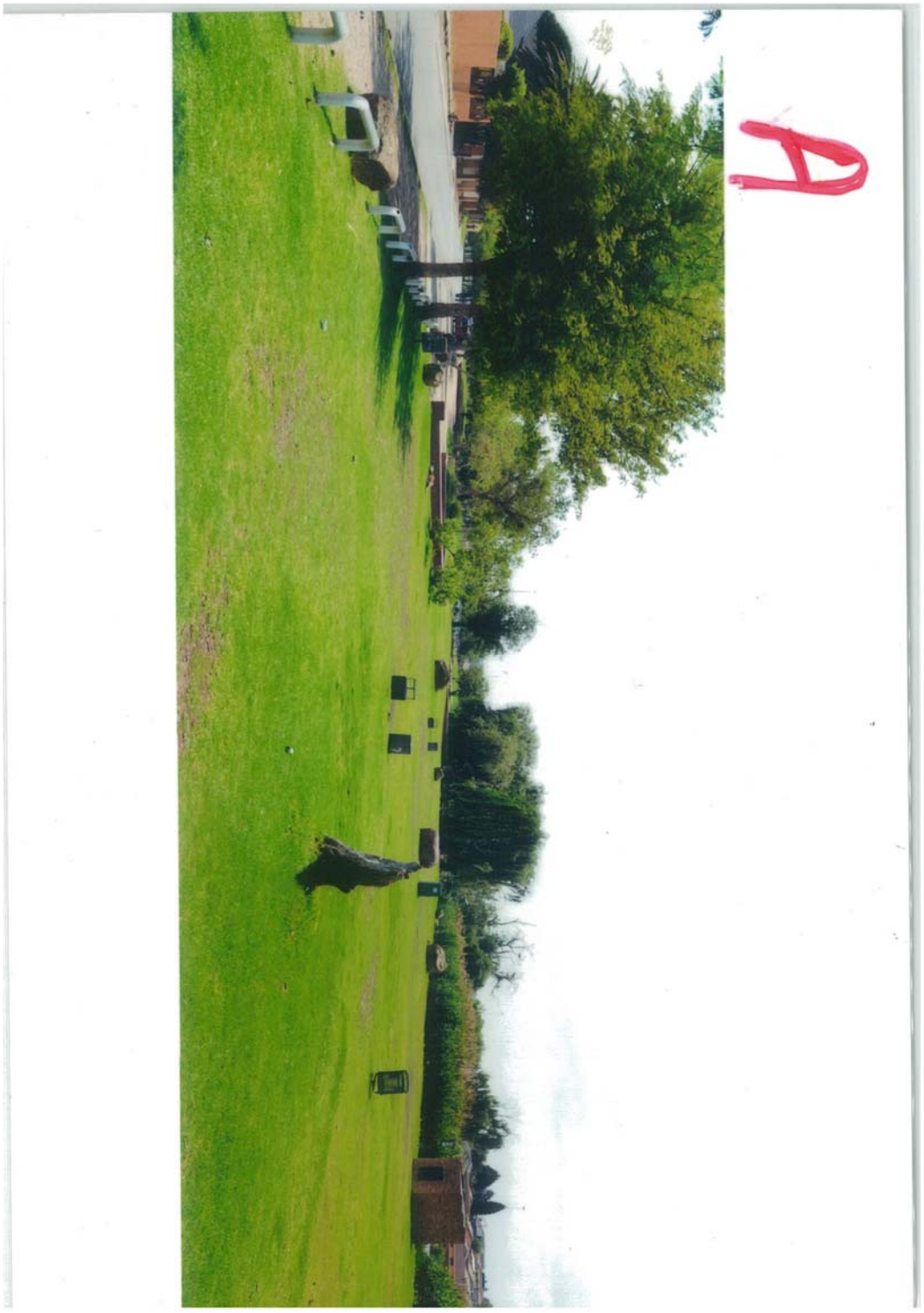
Location of green spaces assessed

Town	Town	Green space type	GPS coordinate
King Williams Town	Sweetwaters	Community **Park**	32°54’090’S, 27° 25’34.8’E
	Sweetwaters	Informal	32°53’55.9’S, 27° 25’49.9’E
	Sweetwaters	Informal	32°53’50.8’S, 27° 25’43.1’E
	Sweetwaters	Commonage	32°53’42.7’S, 27° 25’33.9’E
	Sweetwaters	Commonage	32°53’33.0’S, 27° 25’41.9’E
	Sweetwaters	Informal	32°54’0.02’S, 27° 25’24.0’E
	Sweetwaters	Formal	32°54’.014’S, 27° 25’11.1’E
	Sweetwaters	Informal	32°54’12.1’S, 27° 25’43.8’E
	Zwelitsha	Formal	32°54’49.3’S, 27° 25’19.6’E
	Zwelitsha	Formal	32°55’22.0’S, 27° 25’5’E
	Zwelitsha	Commonage	32°55’50’S, 27° 25’12’E
	Zwelitsha	Commonage	32°53’40’S, 27° 25’14’E
	Zwelitsha	Informal	32°55’36’S, 27° 25’54’E
	Zwelitsha	Formal	32°55’16’S, 27° 25’27’E
	Zwelitsha	Commonage	32°54’54’S, 27° 25’12’E
	Zwelitsha	Formal	32°54’29’S, 27° 25’42’E
	Zwelitsha	Informal	32°55’21.4’S, 27° 25’05.2’E
	Ginsberg	Informal	32°53’11.6’S, 27° 22’34.0’E
	Ginsberg	Commonage	32°53’15.8’S, 27° 22’17.6’E
	Ginsberg	Commonage	32°53’34.1’S, 27° 22’15.7’E
	Ginsberg	Formal	32°53’54.8’S, 27° 23’14.0’E
	Ginsberg	Informal	32°53’41.8’S, 27° 22’53.1’E
	Ginsberg	Informal	32°53’40.6’S, 27° 23’16.9’E
	Ginsberg	Informal	32°53’20.3’S, 27° 23’23.8’E
Queenstown	Ezibeleni	Commonage	31°55’37.3’S, 26° 53’16.1’E
		Informal	31°55’09.9’S, 26° 58’26.6’E

		Informal	31°54’58.9’S, 26° 57’40.7’E
		Informal	31°53’53.0’S, 26° 58’32.4’E
		Formal	31°54’56.4’S, 26° 57’08.1’E
		Commonage	31°53’45.7’S, 26° 58’27.9’E
		Formal	31°53’57.3’S, 26° 57’41.6’E
		Informal	31°53’59.8’S, 26° 57’08.2’E
	Mlungisi	Formal	31°54’42.2’S, 26° 51’49.4’E
		Informal	31°35’08.1’S, 26° 52’17.1’E
		Commonage	31°55’33.0’S, 26° 52’53.6’E
		Commonage	31°55’39.4’S, 26° 52’44.8’E
		Formal	31°55’23.4’S, 26° 52’16.2’E
		Formal	31°55’35.1’S, 26° 52’01.3’E
		Informal	31°54’52.3’S, 26° 52’10.2’E
		Informal	31°54’17.7’S, 26° 52’06.2’E
	Aloevale	Commonage	31°55’53.4’S, 26° 52’06.8’E
		Informal	31°55’33.9’S, 26° 51’48.6’E
		Informal	31°55’33.6’S, 26° 51’38.6’E
		Informal	31°55’18.0’S, 26° 51’24.1’E
		Informal	31°55’17.6’S, 26° 50’38.3’E
		Commonage	31°55’37.9’S, 26° 50’34.1’E
		Informal	31°55’12.1’S, 26° 50’58.0’E
		Formal	31°55’39.3’S, 26° 53’19.1’E

Appendix 4

Photos offered to survey respondents to select which they preferred

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