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# Residents' Perceptions of the Benefits of Visitation to a Botanical Garden in South Africa

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**Abstract:** The purpose of this study was to compare the perceived benefits of users and non-users of the Lowveld National Botanical Garden (LNBG) in South Africa; more specifically, users and non-users who are residents living in proximity to the Garden. The study was quantitative, descriptive, and exploratory and employed a survey research design. A structured questionnaire was used to collect data from a sample of 500 residents (including users and non-users). The results of a principal components analysis for users and non-users revealed shared factors (*i.e.* benefits) between the two groups, including socio-cultural, mental well-being, leisure, and biodiversity benefits. The benefit of escapism was an additional factor elicited for the non-users. Understanding the perceived benefits has practical value in that it may serve as a foundation to develop the product offering of the LNBG and tailor the marketing communication. In this regard, repeat visitation is promoted for users, and non-users may be converted into active users. In turn, this promotes the sustainability of the Garden in an era where visitation needs to be maximized to generate tourist income to supplement limited government funds. The study is considered novel in that it has explored an under-researched population (*i.e.* residents as users and non-users of a botanical garden) and an under-researched topic in a specific context, *i.e.* perceived benefits of botanical garden visitation in South Africa.

**Key words:** botanical gardens; resident perceptions; garden tourism; garden visitation; benefits.

**JEL Classification:** I12; Q26; Z32; R11.

## Introduction

Botanical gardens have played a fundamental role in the history of humanity for centuries (Wassenberg, Goldenberg and Soule 2015). According to Botanic Gardens Conservation International (BGCI), botanical gardens are believed to date around 3000 years ago in ancient Egypt and Mesopotamia (BGCI 2024). Botanical gardens have evolved over time. Historically, they were established to study plants' medicinal properties and cultivate and display exotic plants from newly discovered countries (BGCI 2024; Giovanetti *et al.* 2020). Today's botanical gardens perform multiple roles, including the re-connection of humans with flora and fauna (Dodd and Jones 2010), biodiversity conservation and research (Powledge 2011), meeting human needs and improving

physical and mental well-being (Chen and Sun 2018) and education and recreation (BGCI 2024; Krishnan and Novy 2016; Moskwa and Crilley 2012).

According to Ren *et al.* (2022), there are approximately 4500 botanical gardens worldwide. In South Africa, there are currently ten official national botanical gardens that are state-funded and solely managed by the South African National Biodiversity Institute (SANBI). But, as with many government-funded nature-based sites, alternative revenue sources must be generated to promote the sustainability of such gardens; such income could be generated through increased visitation.

Given that many botanical gardens are located within, or on the outskirts of, cities and towns, they are accessible to a large urban population. Hence, as highlighted by Hermann and Bouwer (2023), they offer visitation opportunities for residents living near the garden. However, little is known about the perceptions of the benefits of visiting urban nature-based sites such as botanical gardens (Wassenberg *et al.* 2015), particularly residents' perceptions. More specifically, there appears to be an apparent absence of literature on the perceptions of residents who have not previously visited a botanical garden, thus an untapped market.

The primary aim of the study was, therefore, to elicit the perceptions of the benefits of visiting the LNBG as held by a sample of residents living in proximity to the Garden; more specifically, a comparison of residents who have previously visited the Garden (*i.e.* users) to those that have not (*i.e.* non-users). Eliciting such perceptions not only contributes to the body of knowledge on botanical gardens as visitor attractions but may also have practical implications for garden management in terms of informing product development and tailoring the marketing messages to a local audience to promote visitation. Furthermore, given the prevalence of visiting family and friends (VFR) as a tourism trend, residents who have visited the Garden could also serve as advocates by encouraging friends and family to visit.

This paper provides a background to botanical gardens as a product of garden tourism and briefly highlights literature concerning residents' perceptions in a tourism context. The methodology is subsequently explicated and findings concerning users and non-users are presented, compared and discussed in relation to existing literature. Conclusions are then drawn and practical implications for managing the Garden are suggested. Finally, the study's limitations are acknowledged, and opportunities for future research are proposed.

## 1. Literature Review

Garden tourism is a form of niche tourism that, according to Benfield (2013,15) refers to "travel to view, or spend reflective or educational time in an area of horticultural creation". A growth sector globally (Benfield 2021), garden tourism is based on several products including famous gardens, UNESCO heritage gardens and gardening events, expositions, festivals, botanical museums, and botanical gardens (Marin *et al.* 2021). Regarding the latter, botanical gardens are defined by BGCI as establishments that hold "documented collections of living plants for the use in scientific research, conservation, display and education" (BGCI 2024). The Botanic Garden of Padua in Italy and the Royal Botanic Garden of Kew in the United Kingdom are considered the first scientific-based gardens (BGCI 2024). Over the years, botanical gardens have proliferated and are now found in 148 countries worldwide (Williams *et al.* 2015), attracting over 500 million visitors annually (BGCI 2024).

In South Africa, there are several botanical gardens, ten of which are official national botanical gardens that are managed by the SANBI, including the Free State, Karoo Desert, Harold Porter, Hantam, Kirstenbosch, KwaZulu-Natal, Pretoria, Lowveld, Walter Sisulu and Kwelera. Collectively, these national gardens receive over one million visitors annually, generating an annual income of over R60 million ($ 3,327,990) just through admission fees (SANBI 2023). Other notable botanical gardens in South Africa include the Durban Botanical Garden (the oldest surviving botanical garden in Africa (est. 1849) and university gardens such as the Manie van der Schijff Botanical Garden of the University of Pretoria and the University of Stellenbosch Botanical Garden. In August 2024, South Africa's first desert botanical garden (Richtersveld Desert Botanical Garden) was officially opened and is a partnership between the SANBI and South African National Parks (SANParks).

The proliferation and evolution of botanical gardens as key garden tourism products have captured the interest of tourism researchers keen to understand visitation determinants and characteristics. Studies have centered on motivations to visit and, to a lesser extent, perceived benefits of visitation. Within many of these studies, visitor socio-demographic profiles have also been generated.

### 1.1 Visitor Motivations

In an early study by Bennett and Swasey (1996) in the United States of America (USA), the motivations for visiting the New York Botanical Garden and the Brooklyn Botanic Garden were elicited. Results indicated that urban residents may visit botanical gardens to reduce the stress of urban life. Key motivations were finding peace

and tranquility, relaxing mentally, and social interaction with friends and family. Later, Ballantyne, Packer and Hughes (2008) conducted research at the Mt Coot-tha Botanic Gardens in Brisbane, Queensland (Australia) and found the most significant motives for visiting the botanical gardens were to enjoy oneself, to admire the garden's scenery, to spend quality time with family or friends, and to enjoy being outdoors/in nature. Of the 150 respondents in the study, most were female, resided in the city where the garden was based and were repeat visitors. The most common age group was 30 – 39-year-olds. Studying five botanical gardens in China, He and Chen (2011) found the common motivations were to get close to nature, to relax, and to enjoy the beautiful scenery.

In South Africa, notable research by Ward, Parker and Shackleton (2010) was undertaken at six national botanical gardens (Pretoria, Harold Porter, Free State Kirstenbosch, Karoo Desert & Walter Sisulu). Most respondents were Caucasian, between 30 and 59 years old, and most had a post-secondary education qualification. In terms of the level of income, most respondents were in the higher income bracket of over R307 200 per annum ($ 17,204). The dominant home language was English followed by Afrikaans. Most respondents resided in urban areas in proximity to the gardens. Regarding motivations to visit, the study found that most users chose to visit the gardens for recreation and psychological reasons rather than educational reasons. Primary motives reported for visiting the gardens included appreciating the garden's natural beauty, exercising, and getting fresh air. More recently, a study on visitation to the Pretoria National Botanical Garden by Hermann and Bouwer (2023) found marginally more female respondents than males in their sample. Most respondents were born in the 1980s (aged 35–44). The dominant home language was Afrikaans and most respondents were married. Most visited the Garden in groups of two adults, had post-high school education and lived in Pretoria where the garden is situated. Key motivations for visiting included hedonism, social dynamics, escape, and health, thereby supporting the findings of Bennet and Swasey (1996) and Ward, Parker and Shackleton (2010). Other key findings included learning about fauna and flora, novelty, and convenience.

Commonalities in the motivations elicited within the above studies include nature appreciation, the wellness benefits of being in nature and the social element of garden visitation. Learning and education, however, only appeared to be identified as a key motivation for visitation in the study by Hermann and Bouwer (2023). This is noteworthy given that the BGCI (2024) advocates education as a significant role of botanical gardens.

### 1.2 Perceived Benefits of Garden Visitation

Visitors may choose to visit a botanical garden because of the anticipated benefits that may be obtained. Whilst motivations and benefits are closely linked, benefits are concerned with the 'outcomes' of visitation. Such benefits include physical and mental health, educational, economic, and social benefits.

Botanical gardens are favourable environments for physical activity (and thus, physical benefits), such as jogging, cycling, walking, tai chi, and yoga (Krishnan and Novy 2016; Maller *et al.* 2009). In addition, Kohlleppel, Bradley and Jacob (2002) suggest that botanical gardens may help visitors reduce stress and improve emotional well-being. Stress relief and relaxation was also a key benefit echoed by Wassenberg *et al.* (2015) in the Leaning Pine Arboretum in California, USA. Similarly, Carrus *et al.* (2017) posit that botanical gardens offer urban residents a chance to reconnect with nature and escape stressful aspects of city life, such as heat, noise, air pollution, and crowded conditions. Moreover, Mock *et al.* (2016) assert that due to the human evolutionary history with nature, people may experience emotional healing in natural settings which botanical gardens provide.

With respect to educational benefits, Wassenberg *et al.* (2015) identified new experiences and learning as key benefits. Sanders, Ryken and Stewart (2018) further suggest that educational initiatives within urban ecological settings can expose the visitor to the impacts of humans on the environment and the species within. Indeed, Dodd and Jones (2010) assert that botanical gardens may provide opportunities to educate the public on conservation to mitigate the environmental concerns surrounding climate change, pollution and natural resource depletion.

Economically, benefits may be either direct, indirect or induced and may accrue for the visitor, the business and the wider society. For example, Aldous (2007) asserts that botanical gardens offer various economic contributions in terms of employment opportunities and revenue derived from entry charges, coffee shops, restaurants and the sale of merchandise. In South Africa, many national botanical gardens commit to employing from the immediate community and, as previously highlighted, generate considerable revenue from entrance fees.

Finally, regarding social benefits, interacting with nature in gardens provides a chance to socialize with other community members. This benefits the community by fostering stronger social cohesiveness and understanding among its members (Maller *et al.* 2005; Moyle and Weiler 2017). According to Dodd and Jones

(2010), urbanisation has caused many people to grow estranged from nature. Today, botanical gardens play a vital role in society by educating the public, re-establishing connections with the natural world, and showcasing sustainable living practices.

In summary, although investigations into visitor motivations and perceived benefits of botanical garden visitation have gained momentum over the past two decades, academic contributions remain somewhat scant given the proliferation of botanical gardens worldwide and the social, economic and environmental roles that they can play. More specifically, there is limited attention given to the understanding of the perceived benefits of garden visitation in a South African context. Furthermore, there is an apparent absence of literature concerning the perceptions of residents living near a botanical garden. Indeed, in the context of tourism, local resident perception studies are commonplace but have tended to centre on tourism impacts and development, such as studies by Abdollahzadeh and Sharifzadeh (2014), Caro-Carretero and Monroy-Rodríguez (2025), Deery, Jago and Fredline (2012), Gannon, Rasoolimanesh and Taheri (2021) and Tam, Lei and Zhai (2022). Other areas of focus have been on residents' perceptions and place/place attachment (*e.g.* Chen, Hall and Pryag 2021; Chen, Dwyer and Firth 2014; Pai, Chen, Lee, Hyun, Liu and Zheng 2023; Ryan and Aicken 2010; Stylidis, 2018) and residents' perceptions and destination branding (*e.g.* Chen and Segota 2015; Ruiz, de la Cruz and Vázquez 2018; Wassler, Wang and Hung 2019). Hence, the focus has been on residents as either observers, beneficiaries or victims of tourism, or informers of destination marketing, rather than as tourism participants (*i.e.*, visitors or tourists themselves). Residents can (and should) be a key target market for botanical gardens; therefore, understanding their perceived benefits of visitation is important. Moreover, understanding non-visitation represents opportunities for potential growth in the market (Baur, Tynon and Gómez 2013).

### 1.3 Study Site

The LNBG is one of the national botanical gardens managed by the SANBI. It is situated at the confluence of the Crocodile and Nels Rivers in Mbombela (formerly Nelspruit) in Mpumalanga, South Africa. Established in 1969, the Garden spans 195 hectares of which 65 hectares are landscaped and accessible to visitors. Its natural vegetation is savanna and is home to various mammals (including hippopotamuses), reptiles and birds. In addition, it boasts cascading waterfalls in summer and holds one of the largest collections of South African trees and cycads (SANBI 2024).

The LNBG's product offering has evolved since its inception. A conference space, restaurant, suspension bridge, environmental centre, braille trail, medicinal trail, children's play area, and aerial walk through a man-made rainforest are just a few examples of the infrastructure developments. A labyrinth is the most recent addition, and the Garden plans to develop a geological trail, according to the curator of the Garden, C. Mathipa (personal communication July 11, 2024). The Garden also hosts various musical, cultural and recreational events, festivals, and children's holiday programmes. It can also be rented out for exhibitions, birthday celebrations, picnics, and weddings. However, despite such innovations, visitor numbers in 2023 were only 58 570 compared to 73 730 visitors recorded during the 2013/2014 financial year (SANBI 2023). Although it is acknowledged that the decline can be attributed to the COVID-19 pandemic, there were only 43 275 visitors reported in the financial year before the pandemic (2019/2020), according to C. Willis (personal communication, August 12, 2024). Hence, there was already a decline before the pandemic. Low visitor numbers are detrimental to the sustainability of the Garden given the necessity to generate income from visitation to supplement the limited government funds. Thus, measures must be considered to bolster visitation and visitor spend.

## 2. Methodology and Methods

Employing a survey research design, the research was quantitative, exploratory, and descriptive. A structured questionnaire was employed for the collection of the data. The questionnaire design drew from previous studies on garden visitation benefits and motivations, including Ballantyne *et al.* (2007) and Ward *et al.* (2010). The questionnaire comprised two sections. The first section elicited demographic information, and the second section was designed to gather residents' perceptions of the benefits of visiting the Garden. Statements about the possible benefits of visiting the LNBG were presented, requiring respondents to indicate, on a five-point Likert scale (1 – strongly disagree to 5 – strongly agree), the degree to which they agreed with the statements.

The study included two parallel target populations: users and non-users of the LNBG residing in the Mbombela municipality area. The questionnaire was administered at different sites within the municipality area (including retail centers, business centers and town high streets) between August 2022 and March 2023. Convenience sampling was used but efforts were made to ensure representativeness by inviting people of various ages, genders, and ethnicities to participate. As the study aimed to compare user and non-user

perceptions held by a sample of residents living in proximity to the Garden, two initial filter questions were posed concerning the respondent's place of residence, and previous visitation to the Garden, respectively. Thereafter, the purpose of the study and the respondents' rights concerning voluntary participation, anonymity, and confidentiality were explained. Once informed consent had been given, the questionnaire was administered by the researcher. In addition, the questionnaire was also made available online.

The STATA version 17 software was used to perform statistical analyses. For the first sample (users) descriptive statistics were drawn in the form of raw count frequencies and raw count percentages for the demographic variables. For the benefits analysis, the mean and standard deviation were drawn. Next, a principal component factor (PCF) analysis with an orthogonal varimax rotation of 23 of the 25 Likert scale items was conducted. The Kaiser-Meyer-Olkin (KMO) criterion was used to determine factors; only factors with Eigenvalues greater than 1.0 were retained. A Cronbach's alpha test was used to test the data for internal reliability. The same analyses were subsequently conducted for the sample of non-users. Results of the factor analyses were then compared to establish any notable differences between the perceived benefits for users and non-users.

## 3. Results and Discussion

The questionnaire elicited 500 usable responses; 377 respondents were users, and 123 were non-users of the Garden.

### 3.1 Respondent Profiles

Table 1 compares the demographic profile of the respondents who were users and those who were non-users. Both sample groups had a similar respondent profile in that most respondents were female, with the dominant age category being between 25 and 34 years. The most widely spoken language was siSwati. The most prevalent responses regarding marital status and employment were single and full-time employment, respectively. Most respondents preferred not to divulge their income level. The key difference between the groups was that most non-users were only educated to Grade 12 (78%), whereas 52% of users had obtained a diploma or higher. In addition, 52% of non-users were employed full-time/self-employed compared to 73% of users. Hence, non-users were generally 'less educated' and less likely to be in employment than users. This suggests that lack of exposure and financial constraints could be possible reasons for non-visitation.

Compared to extant literature, the user profile generally mirrors that of previous studies with respect to residency in terms of proximity to the gardens (*e.g.* Ballantyne *et al.* 2008; Hermann and Bouwer 2023; Ward *et al.* 2010). However, the prominent age category for users was somewhat younger than most previous studies. Unsurprisingly, there were home language differences which could be attributed to the geographical context of the study. With regard to non-users, the apparent absence of extant literature meant that comparisons were not permissible.

Table 1. Demographic profile of respondents (Users v Non-users)

| | | Users | | Non-users | |
|---|---|---|---|---|---|
| **Variable** | **Description** | **Frequency** | **Percentage** | **Frequency** | **Percentage** |
| **Gender** | Female | 232 | 61.54 | 67 | 54.47 |
| | Male | 144 | 38.20 | 53 | 43.09 |
| | Other | 1 | 0.27 | 2 | 1.63 |
| | Prefer not to say | 0 | 0 | 1 | 0.81 |
| **Age** | 18-24 | 66 | 17.51 | 35 | 28.46 |
| | 25-34 | 129 | 34.22 | 42 | 34.15 |
| | 35-44 | 51 | 13.53 | 22 | 17.89 |
| | 45-54 | 101 | 26.79 | 17 | 13.82 |
| | 55-70 | 29 | 7.69 | 6 | 4.88 |
| | above 70 | 1 | 0.27 | 1 | 0.81 |
| **Language** | Siswati | 161 | 42.18 | 57 | 46.34 |
| | Tsonga | 14 | 3.71 | 28 | 22.76 |
| | English | 42 | 10.88 | 12 | 9.76 |
| | Zulu | 26 | 6.90 | 8 | 6.50 |

| | | Users | | Non-users | |
|---|---|---|---|---|---|
| **Variable** | **Description** | **Frequency** | **Percentage** | **Frequency** | **Percentage** |
| | Xhosa | 11 | 2.92 | 6 | 4.88 |
| | Tshivenda | 1 | 0.27 | 3 | 2.44 |
| | Northern Sotho | 10 | 2.65 | 3 | 2.44 |
| | South Sotho | 6 | 1.59 | 2 | 1.63 |
| | Ndebele | 5 | 1.33 | 2 | 1.63 |
| | Afrikaans | 98 | 25.73 | 1 | 0.81 |
| | Tswana | 6 | 1.59 | 0 | 0 |
| | Other | 1 | 0.25 | 1 | 0.25 |
| **Marital status** | Single | 150 | 39.79 | 67 | 54.47 |
| | Married | 134 | 35.54 | 24 | 19.51 |
| | Co-habiting | 44 | 11.67 | 23 | 18.70 |
| | Prefer not to say | 30 | 7.96 | 7 | 5.69 |
| | Divorced | 13 | 3.45 | 1 | 0.81 |
| | Widow/er | 6 | 1.59 | 1 | 0.81 |
| **Employment status** | Full-time | 234 | 62.23 | 54 | 44.26 |
| | Part-time | 32 | 8.51 | 21 | 17.21 |
| | Student | 39 | 10.37 | 21 | 17.21 |
| | Unemployed | 26 | 6.91 | 14 | 11.48 |
| | Self-employed | 39 | 10.37 | 10 | 8.20 |
| | Retired | 6 | 1.60 | 2 | 1.64 |
| **Level of education** | Grd12 | 179 | 47.86 | 95 | 77.87 |
| | N-diploma | 80 | 21.39 | 13 | 10.66 |
| | B-degree | 64 | 17.11 | 8 | 6.56 |
| | Honours | 38 | 10.16 | 3 | 2.46 |
| | M-degree | 13 | 3.48 | 1 | 0.82 |
| | Doctorate | 0 | 0 | 2 | 1.64 |
| **Net Annual Income ZAR** | PNTS | 143 | 38.03 | 69 | 56.10 |
| | below 50 000 | 96 | 25.53 | 41 | 33.33 |
| | 50 001 - 100 000 | 24 | 6.38 | 4 | 3.25 |
| | 100 001 - 200 000 | 35 | 9.31 | 1 | 0.81 |
| | 200 001 - 400 000 | 38 | 10.11 | 4 | 3.25 |
| | above 400 000 | 40 | 10.64 | 4 | 3.25 |

The elicitation and comparison of socio-demographic profiles of respondents may have practical implications for garden management in terms of marketing. For example, discounts could be offered to pensioners for every weekday (not just Tuesdays) to encourage visitation for this under-represented age group. This could be combined with providing wellness activities within the Garden, *e.g.* themed walks. In targeting the non-users who are perhaps not visiting because of financial constraints, 'free access' days could be scheduled (similar to the SANParks free access week initiative). Although not generating income, this would promote biodiversity exposure hence, education and encouragement of environmental stewardship. Regarding language, the dominant language for both groups was siSwati, given the location of the Garden in the province of Mpumalanga, which is predominately a Swati region. Whilst signage and interpretation already exist in this language, the non-users may not know this and hence, promotional efforts could be expanded in this regard.

### 3.2 Perceived Benefits of Garden Visitation

A Bartlett's test of sphericity indicated a value of 0.000, confirming that a factor analysis could be employed. A principal component factor (PCF) analysis with an orthogonal varimax rotation of 23 of the 25 Likert scale

questions pertaining to the benefits was performed on each sample group. The Kaiser-Meyer-Olkin (KMO) criterion was used to determine factors and only factors with Eigenvalues greater than 1.0 were retained. Table 2 shows a comparison of the perceived benefits. Five factors were retained for the users, with the internal reliability of the five factors checked by conducting a Cronbach Alpha test. All five factors had an Alpha value higher than 0.7 which, according to Bryman (2012), is a satisfactory level of internal reliability. For the non-users, six factors were retained; five of the six factors had an Alpha to a value higher than 0.7, and the 6th factor scored a value of 0.6042, which, according to Taber (2018), is satisfactory and, hence, was retained. A comparison of the results shows a high degree of similarity between the two groups.

Table 2. Comparison of perceived benefits of garden visitation

| USERS | | | | NON-USERS | | | |
|---|---|---|---|---|---|---|---|
| **Factor** | **Mean** | **Factor Loading** | **Reliability Co-efficient** | **Factor** | **Mean** | **Factor Loading** | **Reliability Co-efficient** |
| **User F1: Socio-cultural benefits** | **3.78** | | **0.8671** | **Non-user F2: Socio-cultural benefits** | **3.70** | | **0.8254** |
| The opportunity to strengthen social networks | 3.82 | 0.5178 | 0.8595 | The opportunity to strengthen social networks | 3.68 | 0.4817 | 0.8025 |
| The opportunity to buy a book, souvenirs or plants | 3.55 | 0.7574 | 0.8466 | The opportunity to strengthen family ties | 3.89 | 0.4035 | 0.8091 |
| The opportunity to attend a concert or function | 4.05 | 0.5276 | 0.8662 | The opportunity to buy a book, souvenirs or plants | 3.62 | 0.4290 | 0.8136 |
| The opportunity to connect with heritage | 3.79 | 0.867 | 0.8255 | The opportunity to connect with heritage | 3.75 | 0.7987 | 0.7863 |
| The opportunity to connect with culture | 3.60 | 0.8959 | 0.8232 | The opportunity to connect with culture | 3.74 | 0.8759 | 0.7792 |
| The opportunity to connect with one's spiritual side | 3.85 | 0.7045 | 0.8420 | The opportunity to connect with one's spiritual side | 3.50 | 0.7629 | 0.7921 |
| | | | | | | | |
| **User F2: Stress relief and relaxation benefits** | **4.52** | | **0.8612** | **Non-user F5: Recreation benefits** | **3.94** | | **0.8094** |
| Relief from stress | 4.35 | 0.6143 | 0.8304 | An opportunity for emotional and physical rejuvenation | 3.93 | 0.5089 | 0.7686 |
| An opportunity to relax | 4.50 | 0.7540 | 0.8084 | An opportunity to participate in recreational activities | 3.97 | 0.4317 | 0.7582 |
| A sense of peace and tranquility | 4.47 | 0.5168 | 0.8557 | A sense of peace and tranquility | 4.01 | 0.5411 | 0.7373 |
| The opportunity to enjoy natural beauty | 4.68 | 0.8341 | 0.8279 | The opportunity to give children a chance to play outdoors | 3.84 | 0.7252 | 0.7789 |
| An opportunity to get a breath of fresh air | 4.61 | 0.7847 | 0.8366 | The opportunity to eat at the restaurant | 3.73 | 0.4995 | 0.7172 |
| | | | | | | | |
| **User F3: Mental well-being benefits** | **4.26** | | **0.7681** | **Non-user F1: Mental well-being benefits** | **4.10** | | **0.8958** |
| Relief from crowded urban lifestyles | 4.36 | 0.6997 | 0.6718 | Improvement of psychological health | 3.86 | 0.5145 | 0.8861 |
| Improvement of psychological health | 4.20 | 0.7343 | 0.6756 | Relief from stress | 4.03 | 0.7315 | 0.8765 |
| The opportunity for emotional and physical rejuvenation | 4.22 | 0.5598 | 0.7174 | An opportunity to relax | 4.19 | 0.8320 | 0.8799 |
| | | | | An opportunity for emotional and physical rejuvenation | 3.93 | 0.5445 | 0.8872 |

| USERS | | | | NON-USERS | | | |
|---|---|---|---|---|---|---|---|
| | | | | A sense of peace and tranquillity. | 4.01 | 0.5602 | 0.8830 |
| | | | | The opportunity to enjoy natural beauty. | 4.33 | 0.8389 | 0.8748 |
| | | | | The opportunity to get a breath of fresh air | 4.35 | 0.7983 | 0.8754 |
| | | | | | | | |
| **User F4: Leisure benefits** | **4.18** | | **0.7829** | **Non-user F3: Leisure benefits** | **3.85** | | **0.7516** |
| The opportunity to give children a chance to play outdoors | 4.28 | 0.5818 | 0.7561 | The opportunity to strengthen family ties | 3.89 | 0.7141 | 0.6688 |
| The opportunity to strengthen family ties | 4.07 | 0.4368 | 0.7494 | The opportunity to exercise | 3.76 | 0.7263 | 0.7031 |
| The opportunity to exercise | 3.92 | 0.5347 | 0.7384 | The opportunity to have a picnic | 4.24 | 0.6188 | 0.7196 |
| The opportunity to have a picnic | 4.52 | 0.6499 | 0.7521 | The opportunity to buy a book, souvenirs or plants | 3.62 | 0.4457 | 0.7266 |
| The opportunity to eat at the restaurant | 3.85 | 0.5684 | 0.7687 | | | | |
| The opportunity to have a family outing | 4.43 | 0.6060 | 0.7378 | | | | |
| | | | | | | | |
| **User F5: Biodiversity exposure benefits** | **4.43** | | **0.7695** | **Non-user F4: Biodiversity exposure benefits** | **4.14** | | **0.7737** |
| The opportunity to learn something about fauna or flora | 4.32 | 0.8006 | 0.6465 | The opportunity to learn something about fauna or flora | 4 | 0.7185 | 0.7469 |
| The opportunity to appreciate biodiversity | 4.40 | 0.7249 | 0.6013 | The opportunity to appreciate biodiversity. | 4.08 | 0.7705 | 0.6387 |
| The opportunity to connect with nature | 4.56 | 0.5984 | 0.7868 | The opportunity to connect with nature | 4.35 | 0.6283 | 0.6959 |
| | | | | | | | |
| | | | | **Non-user F6: Escapism benefits** | **3.89** | | **0.6042** |
| | | | | Relief from crowded urban lifestyles | 3.77 | 0.6879 | 0.5300 |
| | | | | The opportunity to get away from the busy town | 4.04 | 0.6055 | 0.3143 |
| | | | | The opportunity to attend a concert or function | 3.85 | 0.4122 | 0.6388 |

### 3.2.1 Similarities between Users and Non-Users

Four factors shared the common labels of socio-cultural, leisure, mental well-being, and biodiversity exposure benefits.

#### 3.2.1.1 Socio-Cultural Benefits

The common items that loaded onto the socio-cultural benefits factor included the opportunity to strengthen social networks, the opportunity to buy a book, souvenirs or plants, the opportunity to connect with heritage, the opportunity to connect with culture, and the opportunity to connect with one's spiritual side. For the users, this factor is consistent with earlier research findings, especially those of Maller *et al.* (2005) and Moyle and Weiler (2017) who also found that interacting with nature in gardens offers opportunities for social interaction with other community members, thereby promoting social cohesion and mutual understanding among residents. However, the factor had the lowest mean score for both the users (3.78) and non-users (3.7) suggesting opportunities for product enhancement to change this perception. The Garden could, for example, expand the provision of cultural

and heritage events such as the inclusion of theatrical performances. The LNBG may also be an ideal location for constructing a botanical art gallery or museum, further enhancing the cultural and heritage offerings.

Increasing retail opportunities at the Garden could also increase visitor spend. For example, providing more opportunities for visitors to purchase 'garden-related' products in an onsite retail outlet such as biodiversity-related books and souvenirs. In terms of increasing plant sales, there is an opportunity for improved plant interpretation throughout the Garden. This may encourage visitors to purchase such plants from the nursery for their own domestic gardens. Promotional efforts centred on the Garden's distinctive spiritual feature (*i.e.* the labyrinth) for individuals looking for spiritual benefits could also be improved.

#### 3.2.1.2 Mental Well-Being Benefits

Common items loading onto the factor of mental well-being benefits included improvement of psychological health and an opportunity for emotional and physical rejuvenation with mean scores of 4.26 and 4.10 for users and non-users, respectively. This finding reiterates the importance of botanical gardens providing an 'escape' from urban living with an opportunity to rejuvenate in a nature-based environment, thereby supporting the findings of Carrus *et al.* (2017) and Kohlleppel *et al.* (2002). To this end, the LNBG could heighten its promotional efforts to reinforce this message. The management of the LNBG may also liaise with medical professionals who operate in the emotional and psychological health field to motivate them to actively promote visitation to the Garden.

#### 3.2.1.3 Leisure Benefits

Three common items loaded onto this factor: the opportunity to strengthen family ties, the opportunity to exercise, and the opportunity to have a picnic. This factor highlights how a botanical garden has evolved beyond a site for biodiversity conservation and education, to one of leisure pursuits. In this regard, it echoes the assertion made by Moskwa and Crilley (2012). In response, more family-orientated and exercise-based events could be explored.

#### 3.2.1.4 Biodiversity Exposure Benefits

Regarding biodiversity exposure benefits, three shared items loaded onto this factor, including the opportunity to learn about fauna or flora, appreciate biodiversity and connect with nature. This discovery is perhaps not surprising considering the nature-based experience offered by botanical gardens, enabling people to connect with and enjoy nature; in this regard, the user findings reflect previous studies such as Hermann and Bouwer (2023) and Wassenberg *et al.* (2015), for example. It, therefore, supports the commonly cited botanical garden role of 'education'.

However, there was a difference in the mean scores for the users (4.43) and non-users (4.14) for this factor. This suggests a need for marketing communication to non-users that specifically focuses on the value of learning or product diversification that encourages visitation and, hence, biodiversity exposure. Practically, this could involve dedicating a section of the Garden to an interactive display on the impacts of humans on the environment and climate change and the role of plants in mitigating climate change. Special commemorative days, such as World Environmental Education Day (26 January), could be celebrated and actively promoted. Guided walks could also be expanded to focus on specific themes such as birds, frogs, and medicinal plants, for example, through partnerships with local guides and public sector partners such as the Mpumalanga Tourism and Parks Agency.

### 3.2.2 Differences between Users and Non-Users

The main differences between the two groups were that users perceived a factor relating to stress relief and relaxation benefits while non-users perceived a factor relating to recreation benefits, and a sixth factor that pertained to the notion of escapism.

For the users, six items were loaded onto the stress relief and relaxation benefits factor. Scoring the highest mean (4.52), these six items included relief from stress, a sense of peace and tranquility, an opportunity to relax, an opportunity to get a breath of fresh air, and the opportunity to enjoy the natural beauty. This factor reflects research by Carrus *et al.* (2017), Kohlleppel *et al.* (2002), Wassenberg *et al.* (2015) and Bennett and Swasey (1996) who reported the perceived reduction of stress as a motivation/benefit of visitation.

For the sample of non-users, the factor pertaining to recreation benefits included the opportunity for emotional and physical rejuvenation, an opportunity to participate in recreational activities, a sense of peace and tranquility, the opportunity to give children a chance to play outdoors, and the opportunity to eat at the restaurant. Items that loaded onto the escapism factor (Factor 6) included relief from crowded urban lifestyles, the opportunity to get away from the busy town, and the opportunity to attend a concert or function; in essence, the

need to escape from crowded spaces. This finding reiterates the importance of botanical gardens considering increasing urbanisation and the 'living' challenges that it creates. In this regard, the Garden could reinforce the recreational and escapism opportunities in its marketing communication.

## Conclusion

Botanical gardens are a key product of garden tourism – a growing niche tourism activity globally. In South Africa, the national botanical gardens are managed and funded by the SANBI but, as with many government-funded nature-based sites, alternative revenue sources must be generated to promote the sustainability of such gardens. In many instances, the opportunities for additional income generation are from visitors, generally through entrance fees and secondary spending (*e.g.* retail).

Since botanical gardens are often based in, or on the periphery of, cities, they are accessible to large population centers and, as such, a potential local market. Visitation by such residents can result in various benefits being accrued for both the individual and the wider society. Notably, the income generated from increased visitation can assist in improving the financial stability of the botanical garden. However, in South Africa, the perceived benefits of botanical garden visitation held by residents in the surrounding communities are largely unknown. More specifically, there is an apparent absence of literature on the perceptions of residents who have not previously visited a botanical garden. Therefore, this study aimed to understand and compare the perceived benefits of users and non-users to inform marketing.

Using PCF analysis as a data reduction technique, five key factors (*i.e.* benefits) were retained for the users and six for the non-users. Four factors were common across each group: socio-cultural, leisure, mental well-being, and biodiversity exposure benefits. Escapism was an additional sixth factor generated for the non-users. In general, the results for the users are consistent with previous studies. A comparison of the results for the non-users was not permissible given the apparent absence of literature in this regard.

Overall, a noteworthy finding is that there are considerable similarities between the perceptions of users and non-users. This suggests that marketing does not necessarily need to be vastly differentiated between the two groups but rather more *engaging,* to reinforce the benefits to encourage repeat visitation and convert non-users into users. Ultimately, residents become advocates of the Garden and, in turn, promote the attraction to a broader domestic and international audience (particularly the VFR market), thereby promoting the sustainability of the Garden in an era where visitation needs to be maximized to generate tourist income to supplement dwindling government funds.

In conclusion, it is suggested that this study contributes to the extant literature on botanical garden visitation by exploring a previously under-researched population in tourism (*i.e.* non-users of tourism products) and the under-researched perceptions of residents as *consumers* of tourism products as opposed to being observers, beneficiaries or victims of tourism. In this regard, the study is novel and could also be replicated at other botanical gardens in South Africa and beyond. Furthermore, there is potential for a study that employs a qualitative methodology to gain a deeper insight into the benefits of visiting a botanical garden. Given that non-users' perceived benefits of garden visitation did not differ significantly from users, this may call for further research to understand why residents are not visiting the Garden. It may also be of value to investigate how the non-users' perceptions have been informed.

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## Credit Authorship Contribution Statement

**Izak J. Middel:** Conceptualization, Investigation, Methodology, Formal Analysis, Writing – original draft, Data curation, Validation, Visualization.
**Samantha C. Bouwer:** Conceptualisation, Supervision, Validation, Writing – review and editing.
**Uwe P. Hermann:** Supervision, Validation, Writing – review and editing.

## Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

## Declaration of Use of Generative AI and AI-Assisted Technologies

The authors declare that they have not used generative AI and AI-assisted technologies during the preparation of this work.

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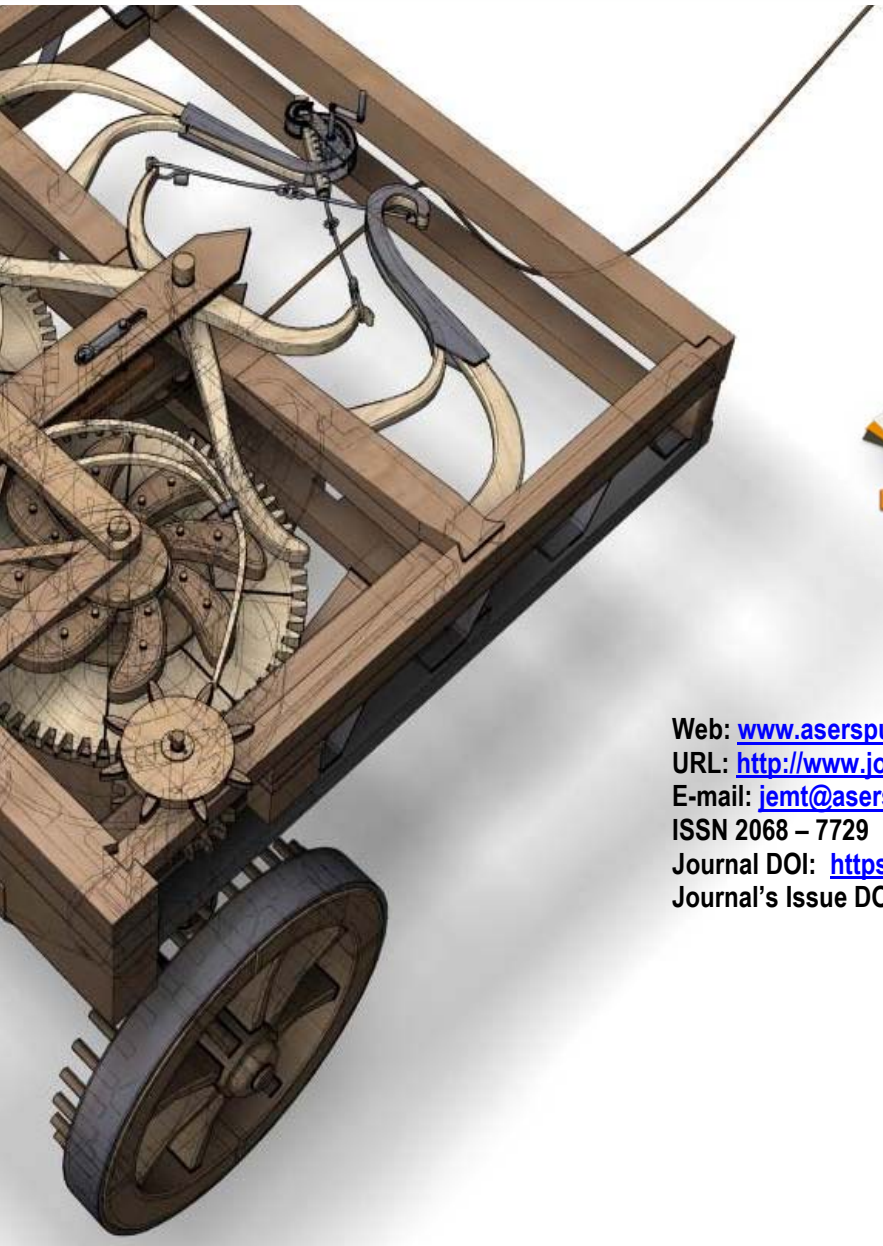

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