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Aesthetic and Spiritual Ecosystem Services Provided by Urban Sacred Sites

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Received: 11 August 2017; Accepted: 9 September 2017; Published: 13 September 2017

Abstract: The range and use of ecosystem services provided by urban sacred sites has hardly been considered in studies of urban ecology, sustainability and human wellbeing. This paper examines the perceived ecosystem services supplied by green spaces or gardens associated with places of religious worship and appreciated by worshippers in a mid-sized town in South Africa. A questionnaire with open, closed and Likert scale questions was administered at 30 places of worship (25 with gardens and five without). Respondents identified a wide diversity of ecosystem services provided by gardens, with social ones being more recognized than ecological, and economic services the least. Approximately two-thirds of respondents visited a sacred site garden weekly or more often. The majority of respondents (96%) felt that a garden was necessary because it added to their feelings of connection with God, or helped them relax and so be better able to concentrate, and 54% stated that a garden enhanced their overall spiritual experience. Regression analysis revealed that aesthetic appreciation of a garden was significantly related to woody plant species richness, number and basal area in the garden. On the other hand, spiritual experience was positively related to woody plant basal area, but not species richness nor tree number. Neither size of the garden, nor number of years the respondents had been visiting a particular sacred site had any influence on the rated spiritual or aesthetic experiences. These results reveal the widely appreciated ecosystem services provided by urban sacred spaces and their centrality in enhancing spiritual satisfaction for some.

Keywords: church gardens; cultural services; plant abundance; species richness; spiritual services

1. Introduction

The importance of ecosystem services (sensu MEA [1]) generated and used in urban areas is increasingly being recognized [2–4], setting the foundation for a revolution in the manner in which sustainable cities are conceptualized and designed [5,6]. Urban dwellers are as dependent on ecosystem services as their rural counterparts, although the origin of many of the services that they consume is often spatially divorced from their immediate surroundings. For example, most food consumed by urban residents is grown well away from the city and transported in, water is captured in high-lying catchments and piped to consumers, and carbon sequestration is typically several orders of magnitude greater in reasonably intact wildlands and forests outside the city than in city centers or suburbs [7].

On the other hand, cultural ecosystem services can be significant in urban settings because of the proximity of high concentrations of people to green infrastructure that may be appreciated, such as parks, rivers, hills, and places of scenic beauty. The distances urban dwellers need to travel to visit these features within a city are usually shorter than travelling to natural areas outside the city, and so large numbers can visit and appreciate such sites and services. There is much work reporting on the recreational use of formal and informal urban green spaces with high benefits to users in terms of relaxation, exercise and socialization [8–10]. These activities provide many benefits

to the users, including improved physical health [11,12], mental wellbeing and reduced stress [13], higher levels of social interaction [14,15], increased sense of place [16] and increased environmental knowledge [17]. While many of these benefits are impossible to monetize, some studies have shown positive willingness to pay benefits for selected cultural ecosystem services in urban settings [9,18]. These must be considered as underestimates because none have looked at the full range of cultural ecosystem services provided or used.

A particular type of cultural ecosystem service that has only a handful of studies is spiritual ecosystem services [19]. The conservation value of sacred sites is recognized because sacred forests, groves and sites typically harbor higher species richness, biodiversity and biomass than the surrounding land uses [20–22]. For example, four percent of the total plant species found in Meghalaya are confined to sacred groves, highlighting their importance in biodiversity conservation [23,24]. This is also the case in Morocco, where certain forest types exist only in sacred areas [25]. Few have examined the spiritual services offered by such sites. However, Gokhale and Pala [26] estimated that approximately 24% of the ecosystem services from sacred sites in two regions in India could be ascribed to cultural services.

In urban settings there has been remarkably little examination of the ecosystem services supplied by sacred sites such as churchyards, temple grounds, cemeteries and traditional spiritual spaces, even though they may constitute significant proportions of the total urban green space [22]. Echoing work from rural sites, a few studies on urban sacred sites have revealed that they may provide refuge to considerable biodiversity that is rare or absent from the broader urban matrix [27–30]. For example, cemeteries are often characterized by some of the oldest and largest trees within a region [31]. They may also harbor remnants of original native flora [27]. Due to the often old age of many sacred areas, they have the potential to preserve old growth trees and forest structure [32,33]. Cemeteries in Campbelltown in Sydney host 505 species, with the older cemeteries hosting more rare, native species than newer ones [27].

As yet the cultural services provided by urban sacred sites have not been examined in urban sustainability debates. They require investigation because urban sacred sites are often managed for different objectives to other formal urban green spaces [34]. Green sacred sites are the formal or informal gardens, spaces, lands and trees associated with any place of worship or spiritual recognition [35], such as Christian churches, Muslim mosques or Hindu/Buddhist temples. Such sacred sites are numerous and can be found scattered throughout most urban settings, and may be managed by a number of different institutions, which potentially diversifies the nature and quantity of ecosystem services that they provide. For example, the Shinto shrines found in the urban forests of Japan serve as the object of nature worship, while the Buddhist forest temples are used as areas for religious training and as areas in which people connect with their spiritual feelings [33]. In India, certain deities are considered to be manifest in specific tree species, with these species figuring prominently in religious practices in towns and cities [36]. For example, *Ficus religiosa* trees provide distinct nodes for worship in cities of southern India, with worshippers defending them against construction and urban development projects [37]; while in the Middle East multiple species and individual trees are revered by specific religious groups [38]. It is probable that the different spiritual beliefs and practices will affect the character and ecology of such sites [39]. Other than the people who maintain urban sacred sites, there are millions of people worldwide who regularly visit churchyards and cemeteries to tend to graves or to worship, as well as those who may only view these areas on passing yet benefit from their tranquility, aesthetics and the nature that they harbor [35]. Recently, mainstream religions have demonstrated an increased interest in environmental matters aiding in the protection of sacred sites [40–42].

Given the substantial lack of knowledge of the spiritual services provided by urban sacred sites [19], and their contribution to human wellbeing in towns and cities, this study sought to examine them in Grahamstown, South Africa. The aim of this study was to determine the perceived and felt benefits of urban sacred sites in Grahamstown. We set out to answer the following questions: (1) How do users of urban sacred sites perceive the sites and what benefits do they obtain? and (2) Are user

perceptions related to sacred area attributes such as age, size, plant species richness, basal area and number of trees?

2. Study Area

Grahamstown (33°18'S; 26°32'E) is a medium-sized town located 60 km inland between the cities of Port Elizabeth and East London, in the Eastern Cape province, South Africa. The altitude is 570 m.a.s.l. Temperatures range between 0 °C and 40 °C, with a daytime average of 22.6 °C. The hottest months are December to March, while the coldest months are June–August. It receives an average of 670 mm of rainfall annually. The city is situated within a region of high biodiversity as it lies in the convergence zone of four major biomes, namely, fynbos, grassland, thicket and karoo [43]. At the local scale, the natural vegetation is grassy fynbos and grasslands on the hill tops, with dense woody thicket in the valleys [43].

It is now a historical and educational center, with a university and numerous private and state schools, while also being the administrative center of the Makana local municipality. The population of Grahamstown is approximately 70,000 [44]. A large proportion of the population (42%) has no or only primary education [44]. Consequently, unemployment is high at 34% and approximately one-quarter of households subsist below the national poverty line. Grahamstown has many historical and contemporary churches, earning itself the nickname, “the City of Saints”. The high number of places of worship makes it an ideal setting for examination of the key questions posed, although the numbers of people regularly attending some places is quite small. It is also a relatively green city, with 13.9% of the area being public green spaces [45], and an additional 2.1% as urban sacred sites [22]. Although the majority of the population identify themselves as being isiXhosa, the city is culturally diverse with people of many different ethnicities, language and religious groups, reflecting broader South African society and a degree of internationalization due to the presence of a well-known university that attracts staff and scholars from around the world.

3. Methods

3.1. Data Collection

Thirty places of worship and five cemeteries in Grahamstown were identified using Google Earth as well as obtaining information from the Grahamstown Historical Society. All were of Christian denomination other than one Hindu temple and one Muslim mosque. For each one an official was contacted to obtain permission for the study. The area of each site was measured and the date of establishment was obtained from interviews with parish elders. A full inventory of shrubs and trees taller than 1.5 m was undertaken, along with soil analysis, as reported by De Lacy & Shackleton [22]. Forty-three percent of the gardens were less than 1000 m², a similar percentage was between 1000 m² and 3000 m² and the balance (14%) were larger than 3000 m² [22].

The second component was the administration of a structured questionnaire to assess the perceived and felt benefits that the congregants gained from their church garden. The first questionnaire was aimed at the congregants of sacred sites that had gardens. It considered how often congregants visited the garden as well as if they believed that the garden was a necessary part of their religious or spiritual experiences. The next section sought to determine the spiritual, aesthetic, and cultural value of trees in the sacred area, as perceived by the respondents. This included all the intangible benefits that the respondents believed they received from the gardens. Culture was included to differentiate the spiritual/religious values specifically. However, we did not prescribe any definition of culture or cultural practices to respondents, following Spencer-Oatey [46] that it is a “fuzzy concept” relating to the conventional behaviors and interpretations based on beliefs and customs learned within a group sharing the same culture. The next section asked the respondents about their overall level of satisfaction with the garden. The last section investigated the core or basic values that influenced their attitudes towards the natural environment. Basic values could determine how people rated a particular sacred area and was achieved using a range of statements against which they were required to select Likert scale

responses of strongly agree to strongly disagree as well as not sure options, following Downs & Stea [47] who recorded attitudes, beliefs and values towards urban green spaces. The questionnaire concluded with a section on the demographic and socio-economic profile of the respondent, considering gender, occupation, age, education, home language, income bracket and race. A separate questionnaire was designed for worshippers at sites without gardens, but was structured in a similar manner. It initially asked respondents whether they believed that a garden would enhance their spiritual experience or not, and if yes, what amenities they would like it to contain. Thereafter it followed a similar structure to the first questionnaire. We acknowledge that there may be other visitors to the gardens other than worshippers, although we did not see any during the field work. We did not seek to sample them because our focus was on the gardens as sacred places rather than general green spaces.

In both cases a box of blank questionnaires was left at the back of the place of worship and the congregants were informed of the study at the end of a service, and were reminded weekly by the relevant official. These boxes, and the completed questionnaires, were collected three weeks later, giving all congregants a chance to return their completed questionnaires. Additionally, online versions were created and sent out to various religious mailing lists as well as the different religious societies associated with Rhodes University. A prompt sheet was produced to guide discussions with the priest, pastor or elders to determine background information such as the age of the building, how the garden is maintained and who maintained it, what the specific uses of the garden are (e.g., weddings), does the garden have any specific attributes to draw people to it (e.g., benches, fountains, etc.), why do they have a garden, and did they think it fulfils its objective.

3.2. Statistical Analyses

The Likert scale options chosen by respondents were summarized for the different congregations. Data were captured and summarized in Microsoft Excel (v10) and imported into StatSoft Statistica (v12) for analysis. A principal component analysis (PCA) was applied to examine the relationship between ecological data (species richness, basal area, number of woody plants) and questionnaire responses, as well as the influence that socio-economic and demographic factors had on responses. Regression analyses were used to further investigate the relationships between seemingly related variables identified in the PCA (only for sites with at least six responses). A chi-squared test was done to determine if there was any relationship between the size of a respondent's private garden at home and the stated preferred size of a garden.

4. Results

Across the 30 sites 25 had a garden and five did not. A total of 132 completed questionnaires were received (after two weekly reminders and the on-line notices to mailing lists); ninety-two from sites with gardens and forty from sites without gardens. The majority (61%) of respondents were female. The average age was 50 ± 22 years. The proportion reporting to be in the lowest tax bracket of less than R150,000 p.a. (\pm US\$10,000) was 78% for those visiting sites of worship with gardens and 61% for those without gardens. We have no knowledge of how representative this sample is of the city population attending religious services.

4.1. Congregants' Use of and Sentiments towards Urban Sacred Spaces

Approximately one-quarter (23%) of the respondents visited the garden between two and four times a week, although most commonly respondents visited on a weekly basis (40%), probably immediately before or after a service. The remainder visited twice a month (8%), monthly (5%), or once or twice a year (10%). Although many respondents attended a place of worship that had a garden, some did not explicitly visit the garden (14%). Of these respondents, the reasons for not spending time in the garden included that the garden was not easily accessible, they had no time, or that they felt that there was no need.

Forty responses were received from congregants who attended places of worship that lack a garden. The majority of these (60%) agreed that sitting in a garden would make it easier for them to

connect with their God, and 68% agreed that a garden would provide an area for spiritual functions to take place. Although the majority of respondents agreed with these statements, it was interesting to note that approximately half (53%) agreed with the statement that a garden was not necessary and that not having one did not influence their spiritual/religious experience. For those respondents (30%) who felt that specific tree species or amenities would improve their religious/spiritual experience they mentioned evergreen trees to remind congregants of the promised eternal life, indigenous trees to bring other native species such as birds, and water features to bring calmness when one is spending time in the garden. When asked what functions would take place in the garden, 68% of respondents stated that religious celebrations such as confirmations, weddings, etc. would use this area after the religious ceremonies had been completed. Other gatherings for social or religious purposes were also mentioned by the respondents, with some stating that a garden could be used for religious retreats.

Almost two-thirds (64%) of the respondents said that they had a garden at their homes. Of these 26 had a garden that was smaller than the one at their place of worship; 12 (19%) had a garden of similar size at their homes, while 17 larger and 9 significantly larger ones were noted. Personal garden size had no significant influence on preferred sacred site garden size ($X^2 = 2.96$; $p = 0.22$).

4.2. Appreciation of Urban Sacred Spaces by Congregants

Over three-quarters of the respondents felt that a garden was necessary adjacent to their place of worship (Table 1). Reasons why included that it (1) added to the sense of peace and tranquility; (2) helped the respondents pray; (3) was aesthetically pleasing; (4) made the buildings look homelier and (5) being in nature helped them relax. The majority of the respondents (60%) felt that if there was no garden, it would diminish the atmosphere in terms of it being a place of spiritual reflection and prayer. This was because the garden provided the congregants a place to step away and ready themselves for the service or prayer. Nonetheless, 27% of the respondents felt that loss of the garden would not diminish their experience, because they felt that it was inside the building where they connected with their God, as well as worship being a state of mind, to which they believed the garden made no contribution. Fifty percent of the respondents said that religious observances and family functions were held in the garden, while 17% were unsure of whether or not functions took place. This mostly included social functions such as fetes, barbeques and teas. There were, however, other religious celebrations such as an Easter Sunday procession, Palm Sunday as well as Holi that took place in the gardens. While many of the religious rituals and celebrations took place in the associated building (confirmations, weddings, etc.) the garden was often used as a place to gather after the ceremonies, with people taking photos, having refreshments and chatting, i.e., the garden was a site for social interaction.

In response to specific statements (Table 1), more than 80% of respondents agreed or strongly agreed that it provides a space for reflection, it provides tranquility and peace, it adds character to the site and it reminded them of the beauty created by God. More than half stated that having a garden “enhanced their religious experience”. Only 34% agreed with the statement that gardens promoted remembrance of the departed, yet all respondents from the only two sites that had a designated garden of remembrance (Trinity Presbyterian and Christ Church) showed 100% agreement with the statement. The level of agreement with the statements did not differ greatly between respondents from sites with gardens and respondents with sites without (Table 1). In the latter group they were considering their level of agreement if their site were to have a garden. Many in this group felt that a garden was necessary as it was part of the tradition, that it would add aesthetic beauty, and that it would function as a gathering place for events and social activities.

Table 1. Percentage agreement (or disagreement) among respondents from sites with (G) or without (NG) gardens on why they felt a church garden was necessary or not (percentages may not total to 100 due to rounding).

A Church Garden is Necessary Because	Strongly Agree		Agree		Neutral		Disagree		Strongly Disagree	
	G	NG	G	NG	G	NG	G	NG	G	NG
It reminds me of the beauty created by God	61	48	27	32	12	18	0	2	0	0
It adds character to the site	53	30	36	50	10	13	1	5	0	2
It signifies tranquillity and peace	63	35	32	53	5	12	0	0	0	0
It enhances ones religious experience	27	10	29	33	32	35	9	17	3	5
It promotes remembrance of departed ones	17	5	17	23	40	52	20	20	5	0
It provides reflection space	39	18	42	70	15	12	2	0	1	0
It is not necessary at all	1	0	5	18	17	35	23	30	53	17

4.3. Contributions to Spiritual, Cultural and Aesthetic Experience

The respondents were asked about particular aspects (such as garden size or diversity of plants) and whether each influenced their aesthetic, cultural or spiritual enjoyment of the garden (Table 2). Most agreed (68%) that the presence of a garden added to the aesthetics, and slightly more than half (54%) felt a garden also enhanced their spiritual experience. However, garden size, plant diversity and the presence of specific species appeared not to improve the aesthetic, cultural or spiritual experience of most respondents. Generally, most respondents felt that aesthetics were most sensitive to garden attributes, followed by spiritual enjoyment and lastly cultural experience.

Table 2. The percentage of respondents who agreed with the given statements about the contribution of specified garden attributes to their aesthetic, cultural and spiritual experience.

Garden Attribute	Aesthetic	Cultural	Spiritual
A garden view would greatly improve my aesthetic, cultural or spiritual experience	68	35	54
My aesthetic, cultural or spiritual experience would improve if the garden were larger	36	4	18
My aesthetic, cultural or spiritual experience would improve if the garden have a greater variety of plants	42	12	18
My aesthetic, cultural or spiritual experience would improve if it had specific tree species or amenities	32	12	14

Questions that were specific to spirituality showed that 40% of the respondents believed that it was easier to connect with God or pray when in the garden. Ways in which the respondents felt that gardens may have influenced their spiritual experience included the flowers and different colors of the garden making them feel welcome, bringing them a sense of calmness, which in turn made it easier for them to feel connected with God. It was also stated that the seclusion of a garden allowed them to anchor their spirit, also helping to connect with God in prayer. Amenities and tree species that the respondents believed would improve their spiritual experience included roses and other “colorful plants”. Some also mentioned how deciduous trees would improve their spirituality, “because they show the season of the year”, reminding the respondents they too will “wither away”. Having a bench in the garden was also mentioned by a number of the respondents, as it would provide a place to sit in comfort and reflect, to spend more time in the garden.

The aesthetically pleasing features that a garden provides were said by 77% of respondents to help reduce stress as well as making respondents (57%) feel healthy once they had left the sacred site. Seventy-six percent of the respondents agreed that they enjoyed the garden as it attracted birds and butterflies. The majority of the respondents (61%) disagreed with the statement that gardens should

be open only to the congregation and their guests. The same was found when the majority (65%) disagreed with the statement that the costs of maintaining the garden could be put to better use. This implies that the aesthetically pleasing views of the garden provide the majority of the respondents with benefits, and that they believe that these areas should be available to the public. Other ways in which respondents believed that an aesthetically pleasing garden influenced their experience was that the beauty made it a lot easier for them to get into the right frame of mind to meditate and connect with God. This was highlighted by a number of respondents. One respondent mentioned how they felt that the tidiness of the garden showed respect for their deity, therefore respect for their God.

In terms of improving their cultural experience, respondents once again mentioned colorful flowers, as well as water features. In this case, there was also an emphasis on indigenous plant species, as they were stated to be good for the environment as well as better equipped to handle the local climate. Deciduous trees were mentioned, as well as biblical trees such as *Cupressus* and sycamores (*Platanus*). Some mentioned how paths within a garden would allow for a stroll to appreciate the different parts of the garden and the plants to be seen. However, 84% of the respondents did not agree that their cultural practices and experiences would be enhanced if they took place within a garden. A number of the respondents emphasized that their experience in these areas was more spiritual and religious, and they did not feel that this had anything to do with their culture. Some, however, did feel that they had cultural experiences in the gardens, such as the Easter Vigil and bringing people together and in so doing creating a cultural community. One respondent stated that they felt that if the garden were open all the time it would become a greater part of their culture. Only a handful of respondents stated that amenities and specific tree species would improve their cultural experience, mentioning biblical and indigenous trees, as well as benches and water features.

4.4. Perceived Social, Ecological and Economic Benefits from Urban Sacred Places

Respondents from sites with gardens, as well as those without gardens, recognized a wide range of social, ecological and economic benefits of having a garden (Table 3). There was very little difference between the two groups. The three most commonly recognized were the provision of habitat for other organisms, a space for social interaction and the aesthetic beauty provided by a garden. Overall, the social benefits were the most widely recognized, followed by ecological and lastly the economic. Most had not given prior consideration to the potential for economic benefits from an urban sacred space.

Table 3. The percentage of respondents from sites with (G) or without a garden (NG) recognizing listed real or potential social, ecological and economic benefits from gardens (percentages may not total to 100 due to rounding; bold indicates significant differences at at least $p < 0.05$) (Adapted from: Chinyimba [48]).

Benefits	Provided (%)		Not Previously Considered (%)		
	G	NG	G	NG	
Social	● As a place to meet that promotes social interaction among congregants	71	83	29	17
	● Improve an individual's mood and relieves stress	70	70	30	30
	● Improve the aesthetic beauty of the religious area	72	80	28	20
	● Offer cultural, spiritual and aesthetic fulfilment	57	50	44	50
Ecological	● Remove pollutants from the air	63	73	37	27
	● Provide a home for birds, insects and small animals	79	80	21	20
	● Help to reduce excessive water loss and run-off from concrete areas and protect soils from erosion	55	67	45	33
	● Purify air and water of an area	58	60	42	40
	● Reduce temperatures by providing shade (regulate micro-climate)	73	77	27	23
	● Help reduce the noise levels	50	43	50	58
	● Mitigation of climate change	38	63	62	38
● Diminish the intensity/force of strong winds	45	43	55	37	
Economic	● Increase house or rent price of houses near the area	29	30	71	70
	● Make the area (and town) a tourist attraction, resulting in employment and revenues	37	53	63	48
	● Reduce energy use (air conditioners, etc.) through regulation of the micro-climate	25	43	75	58

4.5. The Effect of Garden Attributes on User Perceptions

The PCA analysis indicated a positive relationship between the number of trees in a garden and respondents rating of the tidiness and its overall appearance (Figure 1). There was no apparent relationship between the overall level of satisfaction with the appearance of the garden and woody plant species richness, abundance, or basal area. However, the PCA revealed that there was a positive relationship between the respondents' stated spiritual and aesthetic satisfaction and woody plant species richness, basal area and number of woody plants. Direct regression analysis revealed that aesthetic appreciation was significantly related to both the number of woody plants ($r^2 = 0.41, p = 0.02$) (Figure 2c), and basal area of woody plants ($r^2 = 0.49, p = 0.01$) (Figure 2e) in the garden. The relationship with species richness was close to significant, ($r^2 = 0.30, p = 0.06$) (Figure 2a). If the outlier responses from St. Mary's Church were removed, there was then a significant relationship between aesthetic experience and species richness ($r^2 = 0.50, p = 0.01$). In contrast, there was no significant relationship of spiritual experience in the gardens to either woody plant species richness (Figure 2b) or number of woody plants (Figure 2d), but there was a significant positive relationship with woody plant basal area ($r^2 = 0.37, p = 0.04$) (Figure 2f). Neither size of the garden, nor number of years the respondents had been visiting a particular garden had any influence on the rated spiritual or aesthetic experiences (Figure 1).

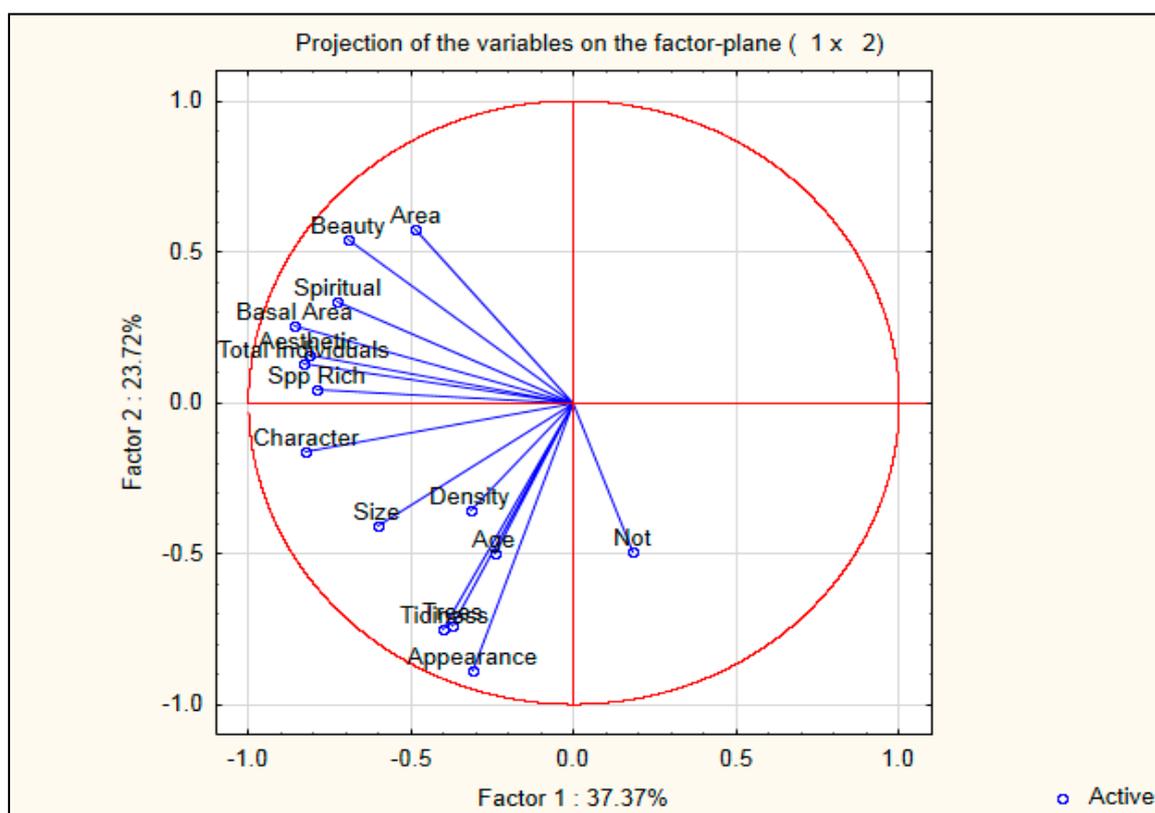


Figure 1. The relationships between stated spiritual and aesthetic experiences and garden attributes (“Not” indicates that a church garden is not necessary at all).

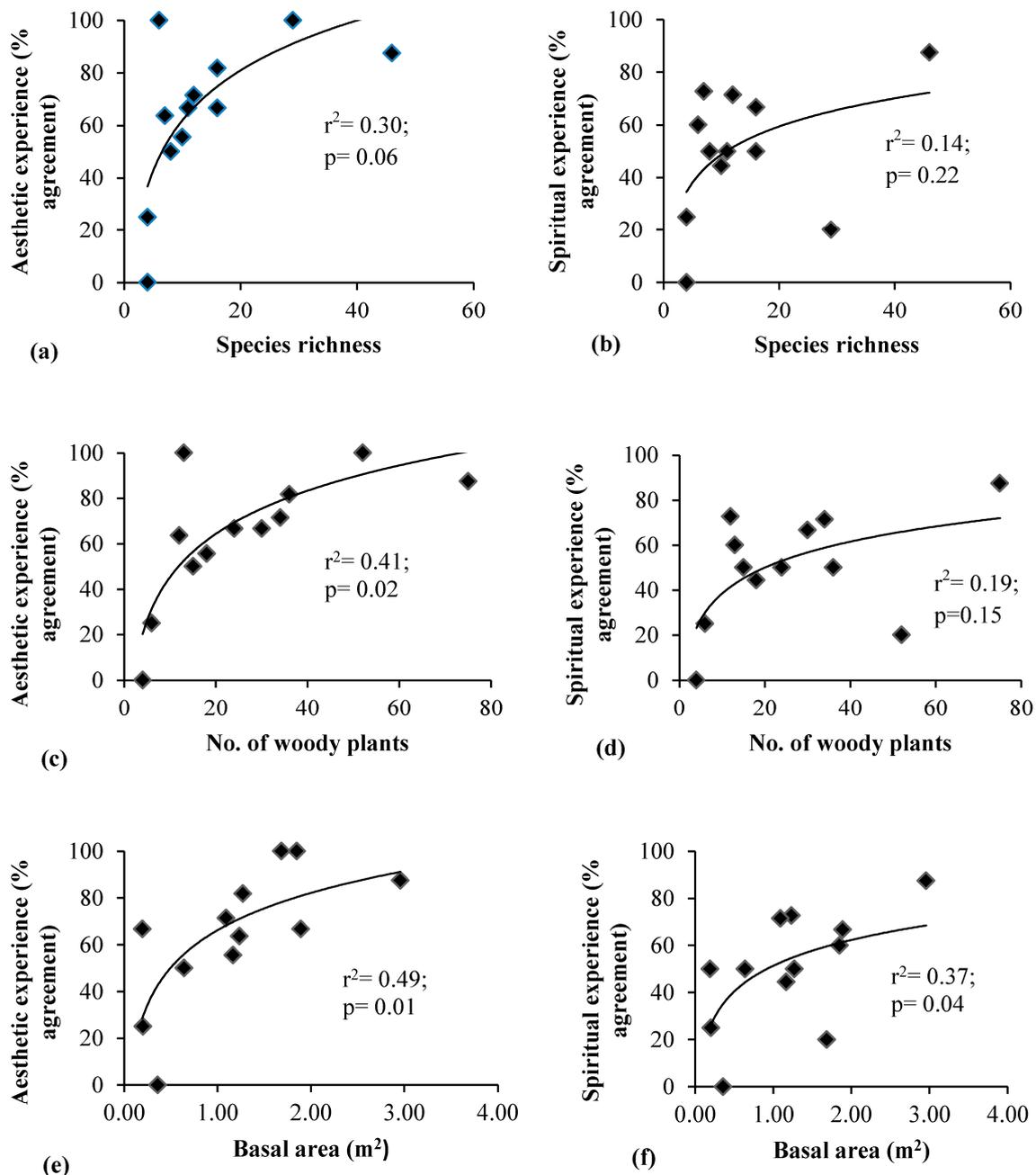


Figure 2. Relationships between species richness (a,b); number of woody plants (c,d) and basal area (e,f), and stated aesthetic and spiritual experience in sacred site gardens.

5. Discussion

Many argue that people have an inherent connection with nature, a phenomenon often termed biophilia [49]. These connections may often be reshaped or constrained in urban settings [50]. Nonetheless, urban green spaces provide a host of cultural ecosystem services and benefits [19], opportunities for recreation [9], social interaction [15], mental restoration [51], improved self-esteem, physical health and well-being [52] and reduced depression and anxiety [13].

Sacred sites have often been looked at separately from other natural areas because of the assumed higher importance placed on cultural and social benefits [33,36,53]. However, compared to the literature on rural sacred areas, there has been only limited consideration of urban sacred sites as green spaces that can offer a range of ecosystem services to urban residents. Indeed, the total area of green sacred

sites in towns can be considerable [22] and hence they deserve to be included in broader debates and plans about urban ecosystem services and green infrastructure. This study sought to bring together the three dimensions of urban greening, ecosystem service provision, especially cultural and spiritual services, and sacred sites within the urban setting.

Of the congregants that had a garden surrounding their place of worship, 86% stated that they spent time in the garden at varying frequencies. The minority that did not visit the garden specifically could possibly still have received some benefits through viewing the garden while walking past [51,54]. Reasons for the majority of the respondents stating that they believed a garden was necessary ranged from it providing them with peace and tranquility to it allowing them to step away from everything else and ready themselves for prayer. Relaxation [55] and the ability to “step away” [56] from the outside world have been associated with natural areas in different settings. That being said, 27% of the respondents stated that if their place of worship did not have a garden, their religious experience would not be diminished in any way. Half of the respondents (50%) stated that they held social as well as religious functions in the garden. Use of green spaces generally has been associated with increased social interaction, which can, in turn, improve health [14,15]. This corresponds with 68% of the respondents from the sites without gardens agreeing that a garden would provide an area for spiritual and social functions. Laforteza et al. [57] stated that green spaces can offer different psychological benefits during different seasons of the year. This was echoed by respondents who said that the presence of deciduous trees would remind the faithful that, like the leaves that wither away in winter, their life will also come to an end, but be ‘reborn’ in the spiritual afterlife, as deciduous trees re-sprout in the spring.

Respondents felt that a garden adjacent to their place of worship improved their spiritual and aesthetic experiences. This could be because of the links that people make with beauty and spiritual values [58]. They did not, however, feel that gardens provided cultural services in the narrow sense of the word. Ward Thompson [59] said that parks form part of local cultural histories. However, respondents in this study emphasized that they did not feel that the gardens contributed much to their local culture. At a finer scale, despite low response rates for several sites there was a positive association between aesthetic appreciation and the abundance of woody plant greenery in the garden, as represented by woody plant basal area and number of plants, as well as species richness. The positive relationship of aesthetic appreciation and greenness reflects much other literature in which respondents express an affinity for green spaces [60,61]. The relationship with species richness has rarely been examined other than the seminal work of Fuller et al. [62], who showed respondents’ ranking of their feeling of distinct identity and to reflect increased in urban parks with increasing species richness.

The positive associations of aesthetic satisfaction with amount of greenery and species richness were not mirrored to the same degree in the respondents’ ranking of their spiritual experience. There was a positive relationship between spiritual satisfaction and woody plant abundance as indexed via basal area, but not number of woody plants. This indicates that perhaps the presence of large trees (resulting in a large basal area) is more important than having lots of trees. There was no relationship with woody plant species richness. This suggests that for spiritual satisfaction it is more the setting and tranquility of the space that is important, and once in the setting congregants then focus on the spiritual dimension rather than being distracted by the finer details of the space, such as variety of species. The low response rates at several sites require some caution in extrapolating these relationships. Kowarik [63] argued that ecosystem services in urban areas depend on biomass rather than species richness or occurrence of particular species. This is validated by respondents stating that their spiritual experience would not be enhanced if the garden was larger, had a greater variety of plants, or contained certain tree species or amenities. This is contradictory to other studies illustrating that benefits received from urban green spaces increased with increasing area [11,62]. This maybe a consequence of most of the gardens in our sample being quite small (the largest being 0.5 ha). Moreover, Nordh et al. [64] pointed out that the restorative benefits of urban parks are not solely a function of park size.

In terms of the aesthetically pleasing space provided by a garden, the majority of the respondents believed that these areas reduced their stress and made them feel healthy. These, along with many other restorative benefits provided by green areas, have been found on many occasions throughout the world [14,56,65]. One respondent said that “the tidiness of the garden showed respect for their deity, as well as for God, as He gave us nature to look after it”. Milton [66] argued that for an area to be sacred it should be pristine. However, these gardens were far from pristine. This may be the case in Japan, where Shinto sacred urban forests are the object of nature worship, being left as natural as possible [33]. This may however be linked to the particular religion of the respondent. Those respondents who stated that the tidiness of the garden showed respect for their deity were all from the Christian faith, a faith that teaches human ‘dominion’ over nature [67]. Other faiths (Hinduism and Buddhism) stress the inter-relationships between humans and the rest of nature, perhaps making for better connectedness between their religious practices and the sacred natural areas [68].

The level of perception of the social, ecological and economic ecosystems services provided or potentially provided by urban sacred spaces did not differ meaningfully between congregants from sites with gardens and those without. Under social ecosystem services, the value of gardens as spaces for social interaction was high among those without gardens. Under ecological services, the biggest difference between the two was recognition for climate change mitigation. Those that did not have a garden felt that church gardens would increase the potential for tourism, as has been reported for other public gardens [17,69]. However, the dispersed locations and small size of the church gardens would militate against being tourist attractions.

6. Conclusions

These findings highlight the importance of sacred sites as contributors to ecosystem services and human wellbeing in a single city. These sites contribute to the spiritual wellbeing of many urban residents in towns and cities, something that many people need to travel long distances to achieve when going on pilgrimages or religious retreats [53]. The positive association between aesthetics and species richness and abundance of woody plants, and between spiritual experience and woody plant abundance indicate that biophysical attributes are important in terms the nature and extent of ecosystem service benefits. Consequently, design and management of urban sacred sites need to be made aware of such and develop gardens to meet local congregant spiritual and aesthetic needs. Lastly, it needs to be appreciated that some of the benefits examined could also be appreciated by non-congregants, such as passers-by [51], termed by Keniger et al. [19] as incidental interactions. Being among the first of its kind, it is important that the findings from this study are tested in other settings around the world spanning a range of contexts and extent of religious observance among urban populations.

Acknowledgments: The authors are grateful to the congregants at the different churches for their willingness to engage in this research. This work was sponsored by the South African Research Chairs Initiative of the Dept of Science and Technology and the National Research Foundation of South Africa. Any opinion, finding, conclusion or recommendation expressed in this material is that of the authors and the NRF does not accept any liability in this regard.

Author Contributions: C.S. conceived the work; both P.D.L. and C.S. designed the study; P.D.L. collect the data; and both P.D.L. and C.S. wrote the paper.

Conflicts of Interest: The authors declare no conflict of interest

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