INSTITUTIONAL PERCEPTIONS AND BARRIERS TO MULTIFUNCTIONAL CEMETERIES

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ABSTRACT
Apartheid spatial planning policies resulted in the current urban form characterising South African cities. This is echoed in the unbalanced provision of bulk infrastructure, social services and facilities between affluent and previously disadvantaged areas. Cemeteries are one land use where these disparities are visible, in terms of their design, provision and management. In Johannesburg, the local government provides cemeteries, which are also classified as part of the heritage and institutional land uses. This classification limits the ability of cemeteries to function beyond their original role of burial, especially amidst shrinking land resources for future cemetery development, and other competing land uses. Cemeteries are planned, developed and managed in isolation without strategically connecting them to other open spaces, which reduces their potential to function collectively with other green spaces to add ecological value to the broader environment. By following a case study approach, this paper investigates institutional perceptions toward multifunctional cemeteries, and barriers that constrain their planning, provision and management in ways that are consistent with green infrastructure and sustainability principles. In-depth interviews were held with government officials as key respondents, to understand constraints of providing and managing multifunctional cemeteries. Officials' cultural beliefs conflict with their role and the City's broader goals of sustainability. The unsustainable design of old cemeteries, particularly in previously disadvantaged areas, is coupled with the ecological imbalances of greenery between these and affluent areas. Over the years, these spatial disparities have contributed to the negative resilience of cemeteries as they persist today.
Keywords: cemeteries, cultural landscapes, healing, green infrastructure, perceptions, social-ecological resilience, sustainability.

1 INTRODUCTION

South Africa's spatial structure has been shaped by its apartheid history, which moulded its socio-economic and political landscape [1]. Apartheid was based on legislation, which ensured strict racial separation and controlled influx into white areas [1]. This control assigned inner cities and suburbs to whites, with other races shifted to the periphery, forcing the poor to the outskirts [2]. This lengthy segregation divided South African cities spatially and institutionally, fragmenting local government too. The legacy of apartheid planning policies is evident in an enduring, highly splintered and unequal system of public infrastructure and community facilities, including green open spaces. The physical gaps, and social and spatial inequalities remain visible [1]. The socio-political history of racial segregation is also reflected in cemeteries. Although cemeteries are no longer developed along religious and racial lines, the colonial and apartheid segregationist laws reverberate in the country's spatial form and fabric [3], [4]. As a result, the potential of cemeteries is not fully realised, especially their ability to function beyond the burial role.

The ecological disparities inherited from apartheid are less commonly discussed than the well-documented socio-economic and racial divisions. These are seen in fragmented patches of green infrastructure in cities. For instance, in the City of Johannesburg (CoJ), areas in the north are well endowed with green infrastructure elements, whereas the south remains barren. In recent years, the City has initiated interventions that erect green elements in public open spaces, intending to rectify previous disparities between affluent and poorer areas [5]; these

include establishing recreational parks, and integrating green elements in open spaces managed by the Johannesburg City Parks and Zoo (JCPZ) (the JCPZ is mandated to provide and manage public open spaces). Over and above disposing of human remains, cemeteries provide ecosystem services, for instance, carbon sequestration, reducing the urban heat island, and shade for cemetery visitors through trees [6]. Some of these functions can improve users' health, particularly when cemeteries are provided as spaces of healing and social interaction. However, integrated uses must be compatible with, and sensitive to users' needs. It is against this background that this paper investigates institutional perceptions and barriers constraining the provision and management of multifunctional cemeteries, in line with green infrastructure perspectives. The paper is one of two that examines this issue. While the focus of the current paper is on institutional perspectives, the second investigates perceptions of cemetery users and social barriers constraining the uptake of multifunctional cemeteries. Following this background, the paper reviews the role of green infrastructure elements when integrated within the cemetery space. The paper then unpacks the multiple uses of cemeteries, in particular their unrealised ecological and social potential. The research methods section discusses the case study, and outlines the instruments of data collection and the purpose behind interactions with respondents. Subsequent to that are the results, which analyse the case and respondents' engagements. The paper closes with conclusions and recommendations, drawing on key findings and examining the benefits and implications of mainstreaming green infrastructure perspectives into cemetery planning.

2 LITERATURE REVIEW

The green infrastructure concept is commonly anchored on the principles of connectivity, accessibility, multifunctionality and scale, which are interlinked in open space management [7]. In parts of North America and Europe, the theory is conceptualised as an alternative and complementary to spatial planning [8]. The integration of green infrastructure then lies on reimagining the use and management of natural landscapes and harnessing as much social-ecological value as possible. This can affect the understanding and impact of green infrastructure, as areas strive to contextualise its meaning and integration, particularly at a local scale. Its meaning is susceptible to dilution, lowering the potential to harness its expanded value. To fully exploit its benefits, a variety of green open spaces must be considered and the underpinning cultural nuances dissected and understood. The following section interrogates the potential of cemeteries when designed and managed as part of the broader green infrastructure with a discussion on how their design as multifunctional spaces should not impinge on their cultural significance.

2.1 Cemeteries as part of the green infrastructure

Cemeteries can form part of the green infrastructure and provide beneficial diverse ecosystem services [9]. They occupy prime land in urban settings, and are often the only green spaces. Scant attention is given to planning cemeteries that respond to multiple urban developmental issues. Although they hardly feature in international and political discourses, and are rarely addressed in planning circles, they can still be strategically designed to play more social-ecological functions. One pertinent example entails designing them to perform complementary functions with the built infrastructure [5], therefore curtailing costly requirements of erecting traditional infrastructure. Johannesburg recently experienced major flooding, as a result of the city's lack of permeable surfaces, hence the catastrophic runoff experienced during the rainy season. Coupled with this, is the poor maintenance of storm water drainage infrastructure. Integrating green infrastructure elements and the use of

permeable surfaces can reduce failing storm water drainage and flooding [10] to contribute to the city's resilience. Interment gives relevance to the burial place connecting people to that environment and community [11]. When considering urban green spaces as "embodiments of personal and cultural identity and history" [12] cited in [9], people have a sense of ownership and consequently become invested in the land with the intention to improve the wellbeing of the community and surrounding ecosystems.

2.2 Cemeteries designed as multifunctional spaces

The role of urban green spaces (inclusive of cemeteries) in providing local ecosystem services forms a huge part of urban resilience and sustainability thinking. However, failure to recognise their potential reduces them to monofunctional spaces, perceived as a luxury without considering their potential for social and ecological values [13]. Schäffler and Swilling [13] emphasize the importance of integrating the built and green infrastructure in rapidly expanding cities. This enhances the value of manmade infrastructure by improving its efficiency in already over-stretched systems. Although greening and diversification within cemeteries does not replace efforts in other spaces, these small-scale efforts enhance resilience of urban spaces and inspire broader efforts throughout the city. The paper concurs with Folke et al. [14], that consequently, a focus on small, manageable systems – such as cemeteries – may contribute towards larger efforts. This would then redress fragmented green open spaces as part of a collective with increased benefits.

"In places where land is at a premium, cemeteries are 'like undiscovered urban parks' and must be re-valued by being re-designed" [15]. This is the case in cities where land is costly. Integrating green elements within cemeteries could enhance the social functioning, normalise death and provide therapeutic benefits to the grieving [15]. If green infrastructure principles are integrated in their planning, cemeteries can function as green buffers, ecological patches and corridors that support habitat conservation [9]. Otherwise, developing them at a more regional scale, which is currently the norm in cities like Johannesburg, requires careful consideration of their connectedness to other urban green spaces to contribute to the rich biodiversity, resilience and sustainability.

Cemeteries and other places of interment could enhance the natural setting of urban areas, through "promoting designs that are multifunctional to enhance the green infrastructure within urban areas" [9]. Although some cities in the global north advocate for the recreational use of cemeteries, this might be resisted in countries such as South Africa, where cemeteries are still viewed conventionally. People's perceptions play a huge role in determining the use of cemeteries beyond their original function. Beyond discussing institutional perspectives, in regards to the integration of multiple uses (and types), it becomes important to engage the public, particularly those living in proximity to cemeteries and those with loved ones buried there. Understanding the conceptual frames of green infrastructure and resilience can help address perceptions toward multifunctional cemeteries. Designs that accommodate multifunctional uses can increase usability and contribute to a community's wellbeing. However, these require careful consideration, particularly in countries of the global south where a mindset shift is dependent on the diversity of cultures and religions.

The public can decide the uses that are beneficial when integrated within cemeteries, without impinging on their cultural and religious beliefs and rights. For instance, if the public believes a cemetery is sacred and should be a quiet space, it would be inconsiderate to integrate active sports. However, such perceptions may change as the surrounding culture and beliefs change. Perceptions of the public are important as they could easily influence whether a facility is used. The general environment and infrastructure can also influence the

use of a facility. For instance, having benches within a cemetery could attract more passers-by to visit and spend a quiet moment, whereas a bushy area could deter people due to safety concerns. This requires taking cognizance of users' perceptions in the design and layout of a facility. While urban planners and providers of burial spaces face a growing demand for land for disposal of human remains, cities are also in need of open spaces to improve quality of life, particularly for those living in highly dense areas. Although ground-breaking solutions are being realised, these challenges are heightened by diverse institutional practices and socio-cultural customs that could hamper their uptake. While the uptake may be slow, diverse solutions to the under-utilisation of urban cemeteries are being recognized, and the demand for urban open space can eventually harness the full potential of cemeteries as a valuable part of the urban ecosystem. When modifying existing cemeteries to accommodate additional uses, authorities face deeply entrenched cultural and religious beliefs and practices. This means substantial public negotiation is crucial as discussed in the following section on the case study selected and instruments used for data collection.

3 METHODS

The first stage entailed selecting a case study that depicted the City's transition from monofunctional cemeteries to those with integrated green infrastructure elements within their designs. Waterval Cemetery, located in Region E of CoJ, was selected as a case study. Fig. 1 shows the cemetery and two townships (Rabie Ridge and Alexandra) that use it for burial. The map displays the bare peripheral parts of the City, and the central and northern suburbs well-endowed with greenery. This critical case depicts one of CoJ's latest, forward-thinking endeavours toward integrating green infrastructure practices within cemeteries. It is one of the most recent and innovative establishments that contribute to the City's redress of the effects of apartheid. Due to the previous unequal distribution of green spaces in the CoJ,
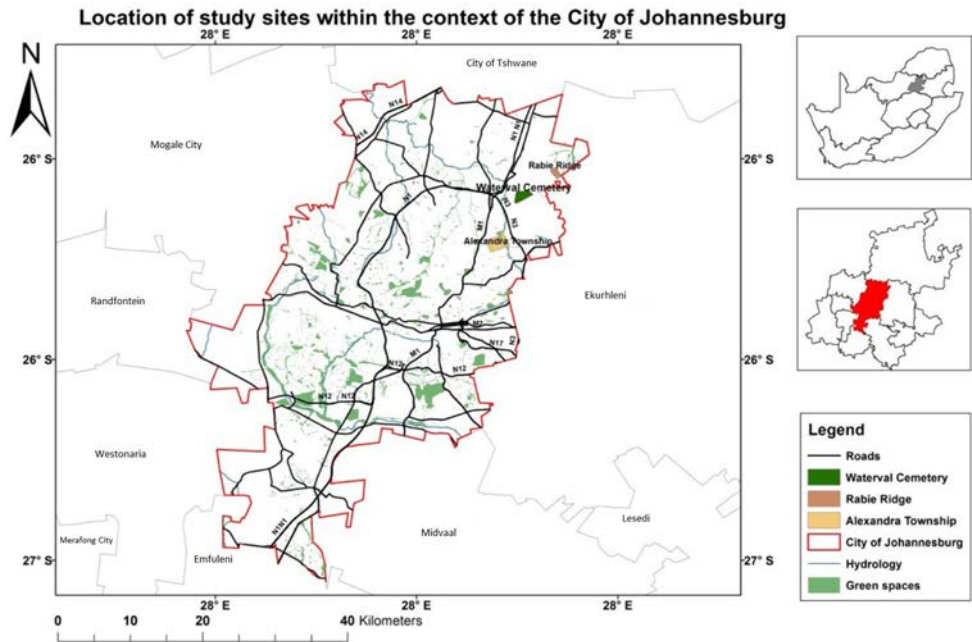

Figure 1: Location map showing study site and townships that use the cemetery for burial.

Waterval Cemetery is a valuable case, because it responds to the imbalanced supply of greenspaces between the affluent and the previously disadvantaged people, mostly located in the south and at the periphery of the city.

The second stage involved visiting the cemetery on different days, at different times, to observe and document the innovative elements integrated within its design, appearance and upkeep. Visits were made on a Monday and a Thursday to view the state of the cemetery on days when there was not much activity. The cemetery was also visited on a Saturday at its busiest. The observations captured the quality of the cemetery and how its design influences its use. The third stage involved nine in-depth interviews with representatives of departments with a stake in the planning, provision and management of cemeteries (Table 1). These interviews lasted between forty minutes to over an hour and a half. Four interviews were conducted with officials from different departments within the JCPZ (Technical Support and Training, Cemeteries and Crematoria Department, the Capital Infrastructure Development Department (CIDD) and the Environmental Protection Department). CIDD plans and develops capital infrastructure projects, of which new cemetery development forms part. To respond to the city's burial demands, CIDD studies burial trends to determine future cemetery development. The Environmental Protection Department reviews geotechnical and environmental impact assessments. These officials were interviewed separately to understand their perceptions of multifunctional cemeteries and to determine barriers each faced in the provision and management of these landscapes.

Table 1: Key respondents ordered according to date of interview.

Respondents (R)	Institution	Role
R1	Johannesburg City Parks and Zoo	Cemeteries and Crematoria Manager
R2	Johannesburg City Parks and Zoo	Infrastructure Development Specialist
R3	Johannesburg City Parks and Zoo	Horticulturalist in Technical Support and Training
R4	Johannesburg City Parks and Zoo	Environmental Protection Specialist
R5	Gauteng Department of Agriculture and Rural Development	Principal Environmental Officer
R6	City of Johannesburg	Strategic Urban Planning Specialist
R7	Newtown Landscape Architects	Developer and Architect
R8	South African Local Government Association	Community Development Specialist
R9	Commission for the Promotion and Protection of Cultural, Religious and Linguistic Rights of Communities	Head of Research

An interview was conducted with a representative from the Department of Environmental Planning and Management, which is responsible for policy and strategy in planning and managing green resources, and oversees that sustainable development strategies are translated into tangible objectives within cemetery development. It was important to understand the department's role in policy that guides planning and management of

cemeteries. This interview was conducted to understand whether multifunctional cemeteries are included in the City's long-term planning. An environmental quality specialist from the Gauteng Department of Agriculture and Rural Development (GDARD) was interviewed. The department ensures that environmental regulations are adhered to during development and operation of any place of interment in the city. The aim was to understand GDARD's role in planning and operating newer cemetery models, and complexities that arise in ensuring that JCPZ adheres to regulations, and norms and standards. As part of the key respondents, an architect in the team of developers for Waterval Cemetery was interviewed to establish the firm's involvement, and the processes and decisions behind the design and development of Waterval Cemetery as a transitional model that integrates green infrastructure elements.

Views from the South African Local Government Association (SALGA) were sought to determine challenges faced by municipalities in providing multifunctional cemeteries, the implications of the shortage of cemetery planning policy that facilitates this, and to establish the support given to municipalities as they bridge the socio-spatial and ecological disparities within cemetery development. A representative from the Cultural, Religious and Linguistic Rights Commission (CRL Commission) was interviewed to understand the cultural implications of integrating multiple uses within cemeteries. It was important to understand the sights of this institution as it has vested interests in cemeteries and issues surrounding people's interment choice as a right to practise their cultural beliefs.

The following section discusses perceptions of these key respondents, which lay a foundation for the constraints to multifunctional cemeteries. As a transitional case, Waterval Cemetery is assessed.

4 RESULTS

The diverse South African context necessitates that culture is mainstreamed into green infrastructure planning. That way, the existing context shapes the meaning cemeteries carry and improves the role they play in the social-ecological system. Apart from a garden-like ambience with personal identity and symbolism, the design considerations for Waterval Cemetery included a flower-selling point, although this is not yet operational. Tourism initiatives through the provision of a heroes' acre have also been proposed, where prominent individuals will be buried.

4.1 Perceptions toward multifunctional cemeteries

4.1.1 Rectifying previous injustices
Five of the respondents acknowledge the role of Waterval Cemetery in bridging the spatial divides between the poor and wealthy areas. Integrating green infrastructure elements within Waterval Cemetery was a response "to correct wrongs from the previous dispensation (apartheid government)" (R5). Most importantly, the underlying motivation is the need to beautify previously bare spaces. Schäffler et al. [5] concede that greening efforts by the JCPZ serve more of a social development objective without fully exploiting the ecological potential of open spaces. This is the case at Waterval. Such greening interventions aid the bereaved cope with and accept the reality of death, and provide a space to memorialise the deceased.

The CRL Commission supported the greening of cemeteries in addressing aesthetic backlogs. However, the Commission opposes any physical activity that would symbolise disrespect for the dead and the bereaved. Contrastingly, the representative from SALGA (R8) highlighted that municipalities were not prepared for multifunctional cemeteries, as this would raise a fair amount of complexity for which most are not equipped. Engagements with the respondents also confirmed this. Five admitted that integrating multiple uses within

cemeteries was against their personal beliefs, which in turn conflicts with their jobs. According to respondent 8, this conflict then creates a situation where officials impose their own beliefs onto the community at large (R8).

Engagements with respondents highlighted the interest to integrate mixed uses within cemeteries, although only in affluent suburbs. When asked whether the City would consider exploring the idea of multifunctional cemeteries, respondent 1 affirmed, "this would not be ideal in townships as people are still very cultural, and would resist such an idea" (R1). According to the official, the city was in a position to propose activities that support the core functioning of the cemetery in townships, as other uses were still too far-fetched. It would seem such a deduction is without basis or support from the community, which affirms respondent 8's argument that officials were reluctant to embrace change. This observation was based on the argument that some officials' decisions were not substantiated by any evidence, but rather unalignment with individual beliefs. Also, referring to cemeteries as "township and affluent" to decide on the type of development that should take place, is quite problematic as it undermines the shift in mindset and the plans to redress socio-spatial inequalities. For the moment, and beyond the strategic integration of ecological services, the only potential uses are tourism-related and those related to the distinct functioning of the cemetery. Increasing the use of the cemetery would require consultation with users (R7).

Earlier on in the study of necrogeography, Francaviglia [16] observed cemeteries as providers of "functional and emotional purposes, as they provide for disposal of human remains and a place where the living can communicate with the dead". Cemetery visitation has been practised for generations, for cleaning the gravesite and performing appeasing rituals to ancestors [4]. Introducing green infrastructure elements increases the opportunity for prolonged visits, as against being a gloomy and eerie space. Waterval Cemetery has water features, taps, benches, and dustbins (Fig. 2). Enhancing the cemetery landscape cultivates social inclusion, cohesion and a sense of community [4]. In addition to the health benefits assumed from the green infrastructure, the prolonged use gives more meaning and attachment to the cemetery. This has the potential to create healthy links with the cemetery as a cultural landscape. This is a step into exploring how the socio-cultural benefits of green cemetery designs can assist with the grieving process, cultivate a culture of accepting death as natural, and improve the links between the living and the dead [4].

According to Francis et al. [17], policies undermine the multiple functions and meanings contained in cemeteries. Inadequate policy guiding the use and transformation of cemeteries

Figure 2: Some amenities integrated within the cemetery design.

manifests in lost opportunities for forward-planning systems (R6). Officials' religious and historical views, socialisation and experiences, shape meaning and the value they attach to cemeteries. In turn, these influence their openness to transforming the cemetery space. This raises conflicting views of the cemetery and what it should be. Due to its historical value, the cemetery embeds within it people's identity and special connections with the dead, where the living relive memories of the departed [3]. Consequently, openness to seeing the cemetery function beyond the common notions becomes difficult and could take time. However, incorporating green infrastructure elements and constant maintenance can enhance the ambience of the cemetery space. This visual release can enhance the visitation experience and, in turn, grief. In this way, the cemetery enhances ecosystem management, improves the visitor's experience and responds to the socio-cultural needs of the community.

4.1.2 Green elements complement the manmade infrastructure

Three of the respondents acknowledge the aesthetic benefits of Waterval Cemetery as a green cemetery, as opposed to realising both social and ecological benefits (R3, R4, R5). Green infrastructure elements integrated in the design and management provide ecological functions within Waterval Cemetery and to surrounding environments (R7). The green infrastructure elements within the cemetery provide a storm water drainage function (Fig. 3), although this was not a strategic and inherent design. This can be seen in the additional drainage system provided, which is separate from the green spaces (Fig. 4). The semi-

Figure 3: The surface provides a storm water drainage function.

Figure 4: Manmade storm water drainage system.

permeable pavements that intercept and retain rainwater during higher precipitation periods are found in the cemetery. Through its berm design, most of the land surface is covered in grasses and trees, which intercept rainwater and reduce erosion and flooding (R7). Beyond the ecological functions, trees also provide shade to users during burials and visitations.

Beyond providing a space of solace and comfort, a cemetery can also complement the manmade infrastructure [13]. Apart from being aesthetically appealing, cemeteries also function as green lungs and facilitate ecosystem management. Should the built infrastructure fail to divert and retain water, the natural infrastructure intercepts water and reduces flooding. By complementing the built infrastructure, the natural pervious elements at Waterval accentuate the redundant measures put in place to intercept water.

Should the manmade infrastructure fail, the natural elements continue to play ecological functions, but to a certain degree. Currently at Waterval Cemetery, the built pervious infrastructure is not properly maintained to increase efficiency and resilience. Integrating compatible uses reduces contestations for land. In a culturally diverse country as South Africa, incorporating compatible uses is key to changing the mindset regarding cemeteries. There is a slow decline in the percentage of people affiliated to a religion, giving momentum to secular views, which could gradually change the meaning attached to cemeteries as spaces of identity and belonging. Integrating ecological features does not affect the cemetery's primary function but requires meticulous planning and design (R4).

4.2 Institutional barriers to multifunctional cemeteries in the CoJ

Cemeteries that incorporate green infrastructure elements and multifunctional designs are difficult to realise, because the city has other urgent needs. Old monofunctional cemetery designs inherited from colonialism and apartheid seem to have influenced people's cultural conducts and rituals (R3). It is these beliefs that preserve the negative resilience of old cemetery models, despite being resource depleting and perpetuating inadequate use of space. It will take much effort to change cultural beliefs and for conversion to happen. Although it is possible to integrate green infrastructure ideas within policy, contextual understanding that influences the transformation of cemeteries will take time.

4.2.1 Dual fiscal constraints affecting multifunctional cemeteries
Provision of burial land in the CoJ depends on availability of funds and land (R2). The JCPZ acknowledges that investing in a green cemetery could be costly, particularly during implementation (R2). However, the benefits ultimately outweigh the costs (R2). The contrasting argument is, investing an already-tight budget in other areas for the community should be prioritised. This argument is interrogated further in the paper on social constraints to multifunctional cemeteries. Adding green elements should be prioritised, provided it does not consume the already-diminishing resources, (i.e. funds and physical space). Although there may exist measures to assess the city's vision and ideal, other factors may be prioritised for its efficient functioning. The provision of housing over land for burial is an example of a land use priority. Fiscal constraints also affect the supply of innovative cemeteries in two ways. Firstly, introducing previously unavailable amenities in older cemeteries requires large investments in spaces that are currently under-utilised. Secondly, although a facility such as Waterval Cemetery is not efficiently used, large sums of money are already invested in its maintenance and management. This money could be directed toward developing new and urgent facilities that will be adequately and frequently utilised. The main setback with incorporating green infrastructure elements is the ongoing maintenance (R1). With the current fiscal constraints and without any revenue generation, maintenance becomes a

challenge, especially once the cemetery reaches capacity and no new burials to generate revenue (R1). Combining compatible functions with interment, which will continue to function even after burial can no longer take place, remains essential. Functions that continue to generate income could increase the cemetery's ability to self-maintain. However, they should be harmonious with users' cultural beliefs.

4.2.2 Fragmentation of respective departments and of green spaces

"Spatial planning cannot be dealt with in isolation, from either infrastructure and service provision or other aspects of land policy" [18]. Planning cemeteries in isolation implies the bulk of the work rests solely on the Cemeteries and Crematoria Department and restricts collaboration and knowledge exchange between departments. In Johannesburg, the provision of cemeteries is dealt with in isolation in terms of their design and location. Location is driven by availability and affordability in terms of purchasing the land (R1, R2). This leads to fragmented and sporadic distribution of green open spaces, which do not enhance biodiversity and collective performance, particularly in terms of ecological functioning (R2). The patchiness reduces efficient use and collective functioning (R2, R4). Providing and managing Waterval Cemetery in isolation reduces the City's ability to synchronise management with other green open spaces. Not being in proximity lessens their potential to function collectively and add ecological value to the larger environment. In the CoJ, cemeteries are merely viewed as part of the heritage and institutional land uses, which can affect their multifunctional role that is different from that of conservation and recreational facilities. Large areas of connected land can provide numerous ecological functions without discontentment from users, since these do not affect their cultural significance and meaning. These ecological functions do not require much conversion and transformation, unlike social functions that would shift the space dynamics.

4.2.3 Conventional planning ideologies and personal socio-cultural views as deterrents

Initiatives that promote indigenous vegetation within cemeteries are largely directed through a conservation lens, rather than from a broader infrastructure planning perspective. Green infrastructure methods are considered expensive without any substantive evidence (R8). This traditionalist thinking causes resistance and skepticism in identifying and implementing alternative infrastructure. Close to half the respondents equate green infrastructure planning and management with conservation and enhancement of aesthetics to the built infrastructure (R1, R2, R5, R9). This thinking shows limited understanding of green infrastructure planning, both in policy and practice. Institutional barriers that constrain the planning and provision of cemeteries through a green infrastructure and resilience lens include conservative planning ideologies that prevent officials from being receptive to newer approaches due to personal beliefs. Their jobs mandate that they enhance the functioning of cemeteries; however, this questions their interest to persuade the uptake of multifunctional cemeteries if they personally oppose them. Their preference is to continue supporting old cemetery designs and management methods, regardless of their sustainability. It is in this regard that old dominant approaches remain unsustainable and negatively resilient, as they perpetuate the inadequate use of the cemetery space.

   "Integrating many uses will be disrespectful to the deceased and their families" (R9). This assertion condemns mixed-use cemeteries. It is based on the perception that merged uses cannot be successful in the South African context. Another contention raised is that such spaces cannot be adequately utilised, since only a fraction of the population will visit the cemetery. Although such arguments should be considered to an extent, currently they remain unfounded [4]. "Cemeteries are not dead spaces" (R1). In South Africa, cemeteries are a

sensitive land use perceived by most as sacred, and therefore viewed in a conventional sense. Although the cemetery landscape has shifted in the global north, it will take time before South Africans accept it as such. The first step toward this calls for their management as cultural landscapes for the community and healing environments for the grieving. Waterval Cemetery carries enormous potential in terms of integrating diverse functions (R7). However, should there be plans to diversify functions within the cemetery, there remains the need to respect different cultures (R7, R9). Because the CoJ, together with the JCPZ, aims for newer cemeteries to act as green lungs (R1, R4), there should be better co-ordination between cemeteries and wider-green space strategies. To an extent, this paper concurs that recently developed cemeteries contribute to ecosystem management in the CoJ. However, they are still not managed as such. It is possible to find ways of improving their connectivity with the wider green spaces.

5 CONCLUSION AND RECOMMENDATIONS

Although Waterval Cemetery meets some of the criteria in providing both social and ecological functions, there is room for improvement. The fact that ecological benefits were not strategically incorporated underscores the insufficient appreciation of green infrastructure planning. This affirms the observation that, generally, green spaces are still viewed as a luxury only a few can access [4], [5], [8]. The old dominant cemetery models introduced during colonialism and apartheid have proved to be negatively resilient in the CoJ. This paper asserts that a shift from grey and monofunctional cemeteries, to innovative ones that are sustainable and positively resilient, is a slow process that calls for contextualisation and integration of socio-cultural perspectives in green infrastructure planning. However, institutional and cultural limits slow this transformation. Although officials can be expected to be somewhat progressive thinkers and planners, their cultural beliefs and those of community members could, nonetheless, derail this conversion. Insufficient studies have examined the conflicting views of government officials in their roles as service providers and their own beliefs. Findings from the paper show that the meaning officials attach to cemeteries occasionally influences their ability to fulfill their mandate.

Johannesburg continues to embark on initiatives that strive for open spaces as green lungs. The integration of green infrastructure elements within cemeteries can strengthen the city's social-ecological resilience. However, this can be realised through a fundamental mindset shift and culture transformation. To strengthen the resilience of communities and the physical landscape, this paper advocates for the planning and management of cemeteries that act as cultural and healing landscapes. This way, not only can the City exploit the social value of these spaces, but their ecological significance as well. This, however, requires a broader approach and appreciation of the changing social dimensions and their contextualisation. Utilising the already-integrated green infrastructure elements and strategically introducing new ones can enhance the functioning of the built infrastructure within the cemetery and beyond its boundaries. Localising green infrastructure principles and interpreting them to fit the local context is important, instead of applying them mechanically to circumstances that may not be a good fit.

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