

EMPLOYEES' PERCEPTION OF THE INFLUENCE OF LANDSCAPE DESIGN ON PRODUCTIVITY IN SELECTED OFFICES IN LEKKI, LAGOS

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Abstract. This study focuses on the influence of landscape design on employee performance in selected office buildings at Lekki. It aims to ascertain whether introducing greenery and biophilic factors within offices can improve workers' productivity, creativity, and well-being. This research employs quantitative research techniques through the administration of questionnaires. The research population for this is employees in office buildings in Lekki, Lagos State, Nigeria. The study used a multistage sampling technique. The sample size 80 was obtained from a sample frame of 99 using the Slovin formula. The data collected was analysed using the descriptive method. The results show a favourable link between landscape design features and employee satisfaction and performance. The study concludes that office buildings with such features as greenery, natural light, and water bodies could positively influence employee performance. Lastly, the study recommends that future architectural and planning practices should prioritise the integration of greenery and biophilic elements in office spaces.

Keywords: Biophilic elements, Creativity, Employee performance, Landscape design, Office building, Well-being

Introduction

Urbanisation and migration to indoor workspaces have led to humans being detached from their natural environment. This division has several adverse consequences, such as high stress levels, low cognitive functions, and generally reduced well-being (Kaplan & Kaplan, 1989; Berto, 2005). As organisations seek more engaged and retained employees, exploring strategies to mitigate these issues has become increasingly important.

This idea of incorporating natural components and green areas in urban architecture is not unheard of. Biophilic design—an architectural approach that believes natural elements positively affect human performance and well-being—has always acknowledged it. It has been found that exposure to nature, or rather its presence even in urban environments, can reduce stress, enhance creativity, increase cognitive capacity, and improve overall satisfaction among residents (Browning, Ryan, Clancy, 2014; Hartig *et al.*, 2014; Kellert, 2018).

The global recognition of workplace biophilic design's significance emphasises its potential benefits to employees' physical, mental, and emotional well-being. This has led to increased research into how workplace landscape designs may affect employee productivity and job satisfaction (Berry, 2017; Oseland, 2019).

However, more localised studies are required in urbanising areas such as Lagos despite this being a widely recognised link between nature, design and wellbeing. Historical fusion with modern elements alongside issues related to rapid urbanisation makes Lagos an interesting case study for investigating landscape designs in office buildings. In Lagos, Nigeria, the fast pace of urbanisation coupled with population growth and economic development has significantly altered the city's landscape. This change is evident in contemporary architectural and design practices, particularly in constructing office blocks, which constitute the core of the city's commercial infrastructure.

This paper seeks to bridge this gap in literature by focusing on Lagos as an example of how much landscapes matter in office spaces. It is meant to offer valuable tips by evaluating the current state of landscape integration, identifying difficulties, and delving deeply into best practices that can be utilised by architects, designers, and others involved in creating workspaces.

1. Literature Review

Office design heavily influences employees' well-being, happiness, and sanity. Natural light, green plants visible from a window, and access to open-air areas can reduce anxiety and stress while lifting moods and improving cognitive abilities (Hassanpour et al., 2006; Hartig et al., 2003). Proper lighting, air quality, noise control, ergonomic design, and spatial layout are also important in enabling a working environment.

Office designs should encourage interactions and spontaneous exchanges, which foster idea-sharing and creative problem-solving. Biophilic designs inspire the creation of environments that foster collaboration and innovation. Open floor plans, collaboration zones, diverse workspaces, and technological support help grow a productive, innovative culture.

1.1 The Concept of Landscape Design in Office Buildings

The contemporary workplace is focused on enhancing employee well-being and attaining high productivity levels. Landscape architecture, which incorporates indigenous elements into biophilic principles, significantly affects employees' psychological health. This goes beyond aesthetics to integrate nature into human habitats to produce psychological benefits for people's mental and physiological health (Kellert & Calabrese, 2015). Kellert and Calabrese (2015) discuss the concept of landscape design in office buildings as follows:

1.1.1 Biophilic Design and Nature Integration

Biophilic design calls for the inclusion of natural elements into buildings. It focuses on natural elements, patterns, and processes to be made part of office spaces. These include indoor plants, water features, natural lighting, and organic materials that help improve air quality and reduce noise pollution, leading to general wellness.

1.1.2 Positive Effects on Human Psychology

Exposure to nature or any form of nature-like aspect decreases stress levels, improves moods, and facilitates attention restoration. This allows people to break from cognitive demands, refurbish cognitive resources and boost concentration and creativity.

1.1.3 Restorative Environments and Cognitive Benefits

Landscape architecture creates environments that can facilitate cognitive restoration. For instance, plants and water create visual relief, improving thinking and creativity.

1.1.4 Employee Engagement and Creativity

Employee involvement and inventiveness in landscape design. This leads to curiosity, a desire for inquisitiveness, and the creative thinking initiative of the workers, leading to improved productivity and innovation.

1.1.5 Branding and Identity

Organisational branding is one area that benefits from beautiful landscapes. A well-designed office space with biophilic elements demonstrates a company's commitment to staff welfare, sustainability, and innovation.

1.1.6 Sustainability and Urban Greening

Landscape design supports sustainability efforts and urban greening to improve air quality, reduce heat island effects and increase biodiversity. Consequently, these ecological advantages lead to more enriching employee experiences, contributing to community wellness.

1.2 Landscape Design Elements

Key landscape design components within office environments are vegetation, daylight penetration, water features or natural materials. They improve indoor air quality and decrease anxiety levels among workers, improving cognitive processes and creating visually soothing areas of work. Table 1 shows the landscape design elements and their benefits identified by Kellert and Calabrese (2015).

Table 1: Land Scape Design Element

S/N	LANDSCAPE DESIGN ELEMENT	DESCRIPTION	BENEFITS
1.	Greenery and biophilic elements	Plants, green walls, vertical gardens, etc.	Improve air quality, reduce stress, improve mood, and boost productivity.
2.	Natural light and views	Daylighting, views of natural scenes	Improve mood, boost productivity, and reduce stress.
3.	Water features and soundscapes	Fountains, ponds, cascades, etc.	Create a sense of tranquillity, mask unwanted noise, and promote a serene ambience.
4.	Nature-inspired materials and patterns	Wood finishes, stone textures, earthy colour palettes	Evoke a sense of organic authenticity and resonate with individuals' biophilic inclinations.

(Source: Kellert & Calabrese, 2015)

1.3 Incorporating Landscape Design in Office Buildings

Biophilic designs focus on integrating nature into office spaces by emphasising natural patterns, materials and forms. Through this approach, you can achieve an outdoor connection that will create a harmoniously inviting atmosphere that resonates with employees' biophilic inclinations.

Table 2: Incorporating Landscape Design in Office Building

S/N	Strategy	Description	Benefits
i.	Biophilic Design Principles	Mimic natural patterns, materials, and forms.	Connect people with nature, create a sense of place, promote movement, and enhance productivity.
ii.	Outdoor Workspaces and Terraces	Extend the office environment beyond the confines of the building.	Provide access to fresh air, natural light, and sensory experiences of nature. Encourage physical movement, promote well-being, and foster a deeper connection to the environment.
iii.	Interior Landscaping and Vertical Gardens	Bring nature into the heart of the office.	Enhance aesthetics, improve air quality, and create a visually stimulating and biophilic atmosphere.
iv.	Water Features and Reflective Pools	Infuse office spaces with soothing sounds and visual serenity.	Promote a multisensory experience that mimics natural environments and fosters a sense of calmness and tranquillity. Create microclimates within indoor environments.
v.	Green Corridors and Biophilic Pathways	Design seamless connections to nature within office buildings.	Provide opportunities for contemplation and relaxation during daily routines. Foster moments of respite and transition.

(Source: Kellert & Calabrese, 2015)

2. Methods and Material

The study employed a quantitative method for collecting data by administering a questionnaire to the respondents. The research population is workers in office buildings in Lekki, Lagos State, Nigeria, and the sample frame is all workers in office buildings in Lekki, Lagos State, Nigeria.

A multi-stage sampling technique was used for the study. The first stage was selecting the study area, and Lekki, Lagos State, was purposively selected because it was the easiest location where office buildings with adequate landscape could be found. The second stage involved identifying office buildings in Lekki, Lagos State, and eight (8) office buildings were identified, as shown in Table 3.

Table 3: Office Buildings in Lekki, Lagos State.

S/N	OFFICE BUILDING	LOCATION
1	Nestoil Towers	Lekki, Lagos
2	Heritage Place	Lekki, Lagos

3	Kings Towers	Lekki, Lagos
4	ONE6 Temple	Lekki, Lagos
5	Sterling House	Lekki, Lagos
6	KPMG Tower	Lekki, Lagos
7	UBA House	Lekki, Lagos
8	Union Bank	Lekki, Lagos

The third stage was filtering the identified office buildings to get those with adequate landscape. Four (4) office buildings (see Table 4) were filtered, and these were purposively selected for the study.

Table 4: Office Buildings with Adequate Landscape in Lekki, Lagos State

S/N	OFFICE BUILDING	LOCATION
1	Nestoil Towers	Lekki, Lagos
2	Heritage Place	Lekki, Lagos
3	Kings Towers	Lekki, Lagos
4	ONE6 Temple	Lekki, Lagos

In the fourth stage, the number of workers in the selected four office buildings was identified; Table 5 shows 99. In the fifth stage, the sample size was chosen, and the Slovin formula (Slovin, 1960) was employed to calculate the number of workers for the study.

The Slovin formula is given as:

$$n = N / 1 + N (e)^2 \dots\dots\dots$$

Where:

n = the required sample size

N = Population

1 = Constant

e = Level of confidence

$$n = 99 / 1 + 99(0.05)^2$$

$$n = 80$$

Thus, 80 office building workers were used for the study. Lastly, a structured questionnaire was administered to 80 workers using a simple random sampling technique based on the ratio of workers in each selected office building.

The collected data was analysed using descriptive analysis, tabulation, frequency, and percentages.

Table 5: Number of Workers in the Selected Office Buildings

S/N	Office Building	Number of Staff
1	Nestoil Towers	22
2	Heritage Place	18
3	Kings Towers	20
4	ONE6 Temple	20

3. Results and Discussions

Out of 80 administered questionnaires, 66 copies of the questionnaire were returned, which represents an 82.50% return rate.

3.1 Demographic Data of the Respondents

This valuable dataset can be used to segment and establish insight into the population under survey. Important variables that are examined include the age, sex, and educational background of respondents. Descriptive statistics form the basis for analysis in this context.

3.2 Age of the Respondents

The age group between 18-30 years has the highest number of respondents, with 40 individuals accounting for 50% of the total. The next closest is those aged between 31 and 40, with 26 respondents representing 32.5% of the total sample (as shown in Table 6). This data describes the distribution by age among participants (employees). It shows that most employees fall within the age range of less than or equal to thirty.

Table 6: Age Distribution of Respondents

Frequency			Per cent
Valid	18-30years	40	50.0%
	31-40years	26	32.5%
	Total	66	82.5%
Missing	System	14	17.5%
Total		80	100.0%

3.3 Gender of the Respondents

Table 7 below presents the gender distribution among respondents. Specifically, women account for 25%, while males comprise about 57.5%. This data suggests an unequal representation of both sexes in this research study, showing corresponding coverage. Such findings indicate that men dominate over women in many office environments where this study was conducted, for instance, here.

Table 7: Gender Distribution of Respondents

Frequency			Per cent
Valid	Male	46	57.5%
	Female	20	25.0%
	Total	66	82.5%
Missing	System	14	17.5%
Total		80	100.0%

3.4 Educational Status of the Respondents

Table 8 shows the educational status of the respondents under study. It is important to note that all respondents have attained university, college or polytechnic certificates, making up a percentage of 82.5 within this category.

Table 8: Educational Status of Respondents

Frequency			Per cent
Valid	University/College/Polytechnic	66	82.5%
Missing	System	14	17.5%
Total		80	100.0%

3.5 Employee Performance

This assessment evaluates the impacts of exposure to the natural environment.

3.5.1 Respondents' motivation to work when surrounded by greenery

Table 9 indicates how motivated the participants were about having greenery around them. According to these records, most employees wanted it, as seen by a positive response rate of 65.0%, and 8.8% expressed a neutral stance. Meanwhile, another similar proportion expressed a negative opinion on this idea, 8.8%. These findings imply that many people feel more motivated when working in greenery areas since such spaces make them emotionally stable.

Table 9: Respondents motivation to work when surrounded by greenery

Frequency			Per cent
Valid	No	7	8.8%
	Neutral	7	8.8%
	Yes	52	65.0%
	Total	66	82.5%
Missing	System	14	17.5%
Total		80	100.0%

3.5.2 Impact of landscape design on respondents' stress level

Table 10 shows the Stress Level affected by Landscape Design. 65.0% answered positively, 8.8% remained neutral, and another similar proportion disagreed with it, 8.8%. From these results, most participants reported reduced stress levels attributed to some design elements incorporated in their settings, suggesting stress relief benefits from this landscape design concept.

Table 10: Impact of landscape on respondents' stress level

Frequency			Per cent
Valid	No impact	7	8.8%
	Neutral	7	8.8%
	Positive impact	52	65.0%
	Total	66	82.5%
Missing	System	14	17.5%
Total		80	100.0%

3.5.3 Impact of landscape on respondents' well-being

Table 11 shows evidence of the effect of landscape on respondents' well-being. The data indicates that 48.8% responded favourably, 16.3% were neutral, and another 10% said no. Overall, a considerable majority of surveyed people perceive the landscape as having a beneficial impact on their health, which signifies positive implications for integrating green spaces in workplaces.

Table 11: Impact of landscape on respondent's well-being

Frequency			Per cent
Valid	No impact	8	10.0%
	Neutral	13	16.3%
	Positive impact	39	48.8%
	Very positive impact	6	7.5%
	Total	66	82.5%
Missing	System	14	17.5%
Total		80	100.0%

These findings support claims by other scholars, such as Berry (2017) and Oseland (2019) that landscape design enhances employee performance. The study found that 65% of respondents felt more motivated when surrounded by greenery. This supports research by Kaplan & Kaplan (1989), who developed the Attention Restoration Theory (ART), suggesting that natural environments reduce mental fatigue and improve focus. In the same vein, the study by Nieuwenhuis *et al.* (2014) found that introducing plants into workplaces increased productivity by 15%, reinforcing this study's findings.

The findings of this study show that 65% of respondents reported a positive impact on stress levels due to landscape exposure. This is in accordance with Ulrich's Stress Recovery Theory (SRT) (1984), which states that exposure to nature reduces physiological stress responses. Also, research by Bratman *et al.* (2015), which found that spending time in nature lowers cortisol levels and reduces rumination, aligns with this study's findings.

This study found that 48.8% of respondents experienced a positive impact, with 7.5% reporting a positive impact on well-being. This aligns with research by White *et al.* (2019), which found that at least 120 minutes per week in natural environments significantly improves health and well-being. A study by Berman *et al.* (2009) also showed that exposure to nature enhances mood and cognitive functioning.

The findings of this study have broader implications in three key areas: theory, practice, and research. Table 12 outlines these.

Table 12: Implications of the Findings of the Study

Domain	Implications
Theory	The study's findings validate Attention Restoration Theory (ART) by Kaplan & Kaplan (1989), Stress Recovery Theory (SRT) by Ulrich (1984), and Wilson's Biophilia Hypothesis (1984). They reinforce greenery's role in motivation, focus, stress reduction, and general well-being.
Practice	The findings of the study encourage workplace biophilic design.
Research	The outcome of this study calls for longitudinal studies, cross-cultural analysis, and linking greenery to corporate performance metrics in workplaces.

Conclusions

The study concludes that office buildings with such features as greenery, natural light, and water bodies could positively influence employee performance. Besides, employees in well-designed offices had higher motivation and lower stress than those with less attractive landscapes. The study supports the widely accepted idea that natural environments positively influence psychological and physiological well-being. It reinforces the call for integrating green spaces in workplaces. The study contributes significantly to existing knowledge and provides a strong foundation for practical and policy-driven applications.

Therefore, future architectural and planning practices should prioritise integrating greenery and biophilic elements in office spaces. Organisations can foster a more productive and positive work culture by creating environments that connect employees with nature. Further research is suggested to explore innovative design strategies that maximise the benefits of landscape design in office buildings. Also, longitudinal studies, cross-cultural analysis, and linking greenery to corporate performance metrics in workplaces are necessary.

Author contributions

Aishat Tayo ABUBAKAR-KAMAR and Aishat Adeola AJENIFUJA conceived the study and were responsible for the design and development of the data analysis. Aishat Adeola AJENIFUJA, Ridwanullahi Abiodun AKEWUSOLA, and Ayangbemi Segun AYANKOLA were responsible for data collection and analysis. Samuel Bolaji OLADIMEJI and Ridwanullahi Abiodun AKEWUSOLA were responsible for data interpretation. Aishat Adeola AJENIFUJA wrote the first draft of the article.

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