INDOOR ENVIRONMENTAL QUALITY (IEQ) AND ITS IMPACT ON JOB SATISFACTION IN GREEN BUILDINGS: A MULTI-FACTOR ANALYSIS

KARIYAWASAM T.[1]* & SAMARASINGHE A.M.
[1,2]NIBM National Innovation Centre, Kirulapone, Sri Lanka
[2]University of Moratuwa, Moratuwa, Sri Lanka
[1]*thilinaisuru.94@gmail.com*, [2]*ajani@nibm.lk*

Abstract: This study explores the impact of LEED-certified building interiors on employee job satisfaction industry in Sri Lanka, with a focus on the MAS Thurulie factory. Adopting a mixed-methods approach, the research integrates quantitative and qualitative techniques to assess how specific green building elements lighting, ventilation, and thermal comfort affect job satisfaction. In the quantitative component, a survey of 180 employees was conducted, utilizing the Employee Net Promoter Score (eNPS), Job Satisfaction Survey (JSS), and specific scales for lighting, ventilation, and thermal comfort. The survey data were analyzed using SPSS, with descriptive statistics revealing an average eNPS score of 30, indicating a favorable overall employee sentiment. Correlation and regression analyses showed significant positive relationships between job satisfaction and the quality of lighting ($r = 0.45$, $p < 0.01$), ventilation ($r = 0.52$, $p < 0.01$), and thermal comfort ($r = 0.48$, $p < 0.01$). Structural Equation Modeling confirmed that these environmental factors collectively accounted for 35% of the variance in job satisfaction. The qualitative component involved semi-structured interviews with 15 employees, 3 supervisors, and 3 design persons. Thematic analysis of interview data highlighted that improved lighting, effective ventilation, and optimal thermal comfort were key factors enhancing job satisfaction. Specific themes included a reported 20% increase in perceived comfort and a 15% improvement in overall satisfaction related to workplace environment. This research contributes to the literature by highlighting the specific ways in which LEED-certified interiors impact job satisfaction in a developing country context. The results offer practical recommendations for optimizing green building design to enhance employee well-being and productivity, with implications for both organizational strategies and broader sustainable building practices.

Keywords: *Green Buildings, Lighting, Ventilation, Thermal comfort, Employee satisfaction*

1. Introduction

Green buildings are buildings designed to reduce the total impact on the environment and human health by efficiently using energy, water, and other resources, protecting occupant health, and improving employee productivity. In this, it engages the use of sustainable materials, renewable sources of energy, efficient waste management systems in the entire lifecycle, design and construction, operation and maintenance (Jacob, 2014) (Kariyawasam & Ajani, 2023). The concepts of green buildings have recently been in high demand in the working and other related literature due to increasing environmental awareness and realization of the need for sustainable development (Liu, Chen, & Yang , 2022). In line with these goals, research interest has grown around various aspects of green building design, particularly focusing on energy efficiency, thermal comfort, and the integration of renewable material (Zheng, 2021). Recent studies highlight substantial advancements in sustainability practices within green building projects, contributing to the rapid expansion of the green building market (Precedence Research, 2024). Further, a 2024 global report on buildings and construction underscores the sector's progress in mitigating environmental impacts and the critical role of green buildings in supporting sustainability goals (Green Policy Platform, 2024). Moreover, recent research has examined the long-term viability and environmental advantages of green buildings, with a particular emphasis on the strategies and practices that drive sustainable outcomes (Wang Y. , 2022). Collectively, these studies underscore the increasing importance of green buildings as a core element of sustainable development and highlight their anticipated impact on future trends within the construction industry (DGJ, 2024).

Satisfaction in the workplace significantly impacts productivity, retention rates, and organizational success, hinging on factors like the work environment, compensation, job security, and interpersonal relationships with colleagues and supervisors. Job satisfaction has been the focus of extensive research, emphasizing its multidimensional nature and the various determinants that shape it. For example, Ahmad and Raja (2021) state that intrinsic and extrinsic motivators are important in developing employee attitudes and levels of satisfaction themselves. (15 Writers, 2024). Moreover, a systematic literature review by ResearchGate (2024) outlines the evolution of research on this topic, illustrating how job satisfaction has been linked to employee performance, mental health, and organizational loyalty (Dinda, 2021). Additionally, the correlation between improved indoor environmental quality (IEQ) and job satisfaction is well-documented. Newsham et al. (2018) found that green-certified buildings demonstrated higher scores on survey outcomes related to job satisfaction and perceived value to clients and stakeholders (Guy R. Newsham, 2018). Sadick et al. (2020) further investigated IEQ satisfaction factors, such as ventilation, thermal comfort, acoustics, and lighting, finding that these elements significantly

*Corresponding author: Tel: +94770329828 Email Address: thilinaisuru.94@gmail.com
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impact job satisfaction in green buildings specifically with Ventilation impact. (Abdul-Manan Sadick, 2020).Also in the context of Sri Lanka, where the economy is rapidly developing and the competitive business environment is intensifying (ScienceDirect, 2023), understanding and enhancing job satisfaction is essential for retaining talent and boosting productivity (Gunasinghe H. S., 2023). Given the unique cultural, economic, and social landscape of Sri Lanka, it is imperative to explore how job satisfaction influences the workforce to develop effective strategies tailored to the local context (Gunasinghe H. S., 2023).

Following the review, the impact of LEED-certified office buildings on employee job satisfaction in Sri Lanka is an emerging area of research that has significant implications for workplace design and employee well-being. Despite previous studies indicating a positive relationship between green building features such as optimal lighting, ventilation, and thermal comfort and employee productivity (Kariyawasam & Ajani, 2023) (Velnampy, 2009) there remains a notable gap in understanding how these elements specifically influence job satisfaction within the Sri Lankan context. This research is significant as it aims to fill the identified gaps by investigating the nuanced ways in which specific aspects of LEED-certified interiors namely lighting, ventilation, and thermal comfort affect employee job satisfaction. Understanding these relationships can inform organizational strategies aimed at enhancing employee well-being and productivity through improved workplace environments (Gunasinghe H. S., 2023).Also this research extends previous work on the impact of green building interiors on employee productivity within the Sri Lankan apparel industry (Kariyawasam & Ajani, 2023) by focusing on job satisfaction, a critical but distinct dimension of employee experience.

To investigate the impact of interior factors such as lighting, ventilation, and thermal comfort on Employee Satisfaction in green buildings, this research focuses on MAS Thurulie as a case study. MAS Thurulie, the flagship factory of MAS Holdings, is a pioneering achievement in the apparel manufacturing industry. It stands as the world's first clothing factory powered entirely by carbon-neutral sources. Recognized for its exceptional commitment to sustainability, Thurulie has earned the prestigious LEED [For green buildings, Leadership in Energy and Environmental Design certification is one of the most outspoken benchmarks in measuring the environmental performance of buildings.]Platinum status [Under LEED BD+C: New Construction (v2.2)], marking it as the first establishment in Sri Lanka to achieve this distinction. (Kariyawasam & Ajani, 2023) (Economy, 2016). The LEED certification for this building recognizes several IEQ credits achieved through advanced lighting, ventilation, and thermal comfort systems. Lighting contributed to the 'Controllability of systems - lighting' and 'Daylight and views - daylight 75% of spaces' credits by maximizing natural light while maintaining comfortable indoor brightness levels. Ventilation enhancements, following ASHRAE standards, helped achieve credits under ‘Increased ventilation' and ‘Outdoor air delivery monitoring’ while thermal comfort systems contributed to credits under ‘Controllability of systems - thermal comfort', ‘Thermal comfort – design’, ‘Thermal comfort verification’ by maintaining consistent indoor temperatures and humidity control.

2. Methodology

This study used the mixed-methods approach, integrating both quantitative and qualitative research techniques to investigate the impact of green building elements, specifically lighting, ventilation, and thermal comfort, on employee job satisfaction

2.1. QUANTITATIVE COMPONENT

A detailed questionnaire was developed to assess employee job satisfaction concerning green building features. The sample population for this survey consisted of employees from both administrative offices and production areas within the LEED-certified building. Approximately 26.1% of the participants were from administrative offices, while 73.9% were from production areas, enabling a balanced perspective across different work environments. The survey included several key components,

- eNPS: This metric examines the employee's satisfaction and engagement in terms of willingness to recommend the company as a place of work. By likelihood of recommendation, responders are classified into three groups Promoters, Passives, or Detractors where scores 9-10, 7-8, and 0-6, respectively, fall under eNPS, which is the percentage of Promoters Minus Detractors. (Rao, 2019)

eNPS = (% of promoters) - (% of detractors)

- JSS: Job Satisfaction Survey—a general measure of job satisfaction, covering all the major areas of the work environment and experiences. (Gunasinghe H. S., 2023)
- Lighting Satisfaction Scale: This scale evaluates employee satisfaction with natural and artificial lighting conditions.
- Ventilation Satisfaction Scale: This scale assesses satisfaction with air quality and the effectiveness of ventilation systems.
- Thermal Comfort Satisfaction Scale: This scale gauges’ satisfaction with thermal comfort in the workplace. Each item was rated on a 5-point Likert scale, ranging from 1 (Strongly Disagree) to 5 (Strongly Agree) (Neda Mirzaei, 2020)

Participants were purposively selected from MAS Thurulie. The sample size of 180 employees was selected to ensure statistical significance, as determined by power analysis. Surveys were administered online for maximization of reach and convenience to participants, with follow-ups to increase the response rate. Quantitative data were analysed in the SPSS using different statistical techniques to derive meaningful information from these survey responses. Descriptive statistics were computed for demographic data and overall survey responses so that there could be a clear overview of the characteristics of the participants and satisfaction levels. Reliability analysis using Cronbach's alpha was carried out to test the internal consistency of responding scales used, hence ascertaining that the measurement tools were reliable. This study also included correlation and regression analyses as inferential statistics to establish whether any relationships existed between these independent variables of lighting, ventilation, and thermal comfort on the dependent variable of job satisfaction.

2.2. QUALITATIVE COMPONENT

Semi-structured interviews were conducted to delve deeper into the experiences of employees with green building features. The questions of the interview personal experiences regarding lighting, ventilation, and thermal comfort; the perceived impact of these features on job satisfaction and productivity; and suggestions for improvement. These interviews were, face-to-face and Call based. In total, 15 employees, 3 supervisors, 3 nominated persons, and the Design persons who designed this facility were interviewed for this study. Qualitative data were analysed using thematic analysis.

2.3. ETHICAL CONSIDERATION AND LIMITATION

Ethical approval was obtained from the relevant institutional review board. Participants received detailed information about the study's purpose, procedures, and their rights, including voluntary participation and confidentiality. Informed consent was obtained before data collection. Anonymity and data security measures were strictly adhered to, ensuring participants' privacy and data protection. Moreover, limitation to objective data itself is a limitation. This study acknowledges potential limitations, including self-report bias in survey responses and the generalizability of findings beyond the selected Case study. (Kariyawasam & Ajani, 2023)

3. Discussion and Findings

3.1. VENTILATION

Ventilation in green buildings, the provision of 'clean' air, usually from outdoors, into a space ushers out stale air and may be provided by natural or artificial means. There is a large body of research pointing to the critical role ventilation can play in improving employee productivity, Satisfaction and well-being. A meta-analysis published in 2006, covering 24 studies, reported that ventilation standards, usually 8-10 l/s, are probably too low to achieve optimal employee productivity and satisfaction. (Kariyawasam & Ajani, 2023). Moreover, according to a study by Abbaszadeh et al. (2006), green building offices with improved ventilation systems lead to greater employee productivity and satisfaction, lower absence rates, and overall happier employees. These findings are echoed by Armitage et al. (2006), who highlighted that the positive impact of enhanced ventilation on employee performance and satisfaction is a key factor in the design of green buildings (Thatcher & Milner, 2012). A more recent study from the Harvard T.H. Chan School of Public Health revealed workers in green, well-ventilated offices scored 61% better on cognitive function tests than their counterparts in conventional office buildings, showing the potential for ventilation to improve the way employee's minds work. (Zigurt, 2023). Ventilation's influence extends to employee health, with Singh et al. (2010) noting that employees in well-ventilated green buildings report fewer adverse health conditions such as respiratory problems and headaches, which are common in poorly ventilated environments. These health improvements translate to reduced absenteeism and increased productivity and job satisfaction (Singh & Syal, 2010).

Ventilation in MAS Intimates Thurulie is key to a healthy and productive indoor environment. The facility utilizes a hybrid approach that marries natural and artificial ventilation to optimize IAQ. Indeed, this ingenuity incorporates cleverly located openings and courtyards that allow a good flow of natural air through the buildings and, hence, an enhanced circulation of fresh air. This natural ventilation thus assumes a very significant role in the tropical climate of Sri Lanka, especially in cooling efficiently without depending on mechanical systems. Additional artificial ventilation units are installed in the factory to supplement passive systems and work to enhance the natural flow of air. This balanced solution realizes an indoor air movement perceptible of about 0.8 meters per second, adding to employees' comfort. This balanced approach to using both ventilation methods not only refines IAQ but also goes toward the sustainability of the factory with respect to reduced energy use. Besides its ventilation systems, MAS Intimates Thurulie uses mechanical cooling solutions that aim at reducing 25% of its energy use compared with similar facilities. High-efficiency HVAC equipment with proper zoning and the use of ceiling fans augment air motion inside the factory. (Kariyawasam & Ajani, 2023) (Lokuliyana, 2024) (Weerasinghe T. , 2023) (Fernando, 2024) (Weerasinghe S. , 2023) (Leibundgut, 2009).The analysis of survey responses reveals several insights into the environmental factors affecting job satisfaction, specifically focusing on ventilation and air quality. Below the categorized data collect through the survey and the table presents the mean and standard deviation for various aspects of ventilation satisfaction.

- Gender: 95 males (52.8%), 85 females (47.2%)
- Age: Mean age = 34.6 years, SD = 7.3

- Job tenure: Mean tenure = 4.2 years, SD = 4.1
- Position: 47 Office Employees (26.1%), 133 Factory employees (73.9%)

Table 01: Ventilation Satisfaction

Scale	Mean	SD
Air Quality	4.1	0.6
Ventilation System Effectiveness	3.9	0.8
Fresh Air Frequency	3.8	0.7
Control Over Ventilation	3.5	0.9
Overall Ventilation Conditions	3.9	0.7

(*Source: Survey Data*)

Respondents generally expressed high satisfaction with air quality, with a mean score of 4.1 and a standard deviation of 0.6. This sentiment was echoed in the qualitative feedback, where high satisfaction with air quality was a recurring theme. One respondent noted, "The air quality in the office is excellent, it feels fresh and helps me stay focused." This highlights the positive impact of good air quality on employees' concentration and overall well-being. The effectiveness of the ventilation system received a mean score of 3.9 (SD = 0.8). While generally well-received, some participants indicated a desire for more control over the system to enhance their comfort. A participant remarked, "The ventilation system is effective, but having more control over it would enhance my comfort." This suggests that while the system is performing adequately, personalization could further improve satisfaction. The frequency of fresh air received a mean score of 3.8 (SD = 0.7). Employees appreciated the circulation of fresh air but indicated room for improvement. One comment reflecting this view was, "Fresh air circulation is good, but it could be improved with adjustable settings." Control over ventilation had a lower mean score of 3.5 (SD = 0.9), indicating a desire for greater personal control over the ventilation settings. This theme was frequently mentioned, as highlighted by an employee who stated, "I wish I could adjust the ventilation settings more to suit my personal comfort." This suggests a need for more customizable options within the ventilation system to meet individual preferences better. Overall ventilation conditions were rated with a mean score of 3.9 (SD = 0.7). The qualitative feedback aligns with these findings, emphasizing the importance of air quality and ventilation system effectiveness on employee satisfaction. Comments such as "Breathing clean air in the office is refreshing and helps me concentrate" and "I appreciate the ventilation system, but more control would be ideal" underscore the need for effective and adjustable ventilation systems to enhance workplace comfort. The reliability analysis indicated good internal consistency for the lighting satisfaction scale, with a Cronbach's alpha of 0.82, suggesting that the scale is a reliable measure of lighting satisfaction. The correlation analysis revealed a significant positive correlation between Ventilation satisfaction and job satisfaction ($r = 0.48$, $p < 0.01$), indicating that higher satisfaction with lighting is associated with higher job satisfaction. A regression analysis was conducted to predict job satisfaction based ventilation satisfaction. The model summary indicated that the regression model explained 35% of the variance in job satisfaction ($R^2 = 0.35$, $F(3, 176) = 31.5$, $p < 0.01$). All predictors were significant [Including other Variables], with ventilation satisfaction being the strongest predictor ($\beta = 0.31$, $p < 0.01$).

3.2. LIGHTING

In green buildings, lighting both natural and artificial plays a big role in the shaping of IEQ, which has follow-up effects on job satisfaction among occupants. It can be inferred from several studies that, especially, the availability of natural light makes it easier for better well-being and productivity to be achieved for employees. For instance, a study by Edwards and Torcellini (2002) found that exposure to natural light can improve mood and energy levels, leading to higher job satisfaction and productivity. (Edwards & Torcelini, 2012). This is corroborated by further studies demonstrating that natural light reduces eye strain and fatigue, while also improving sleep quality, all of which contribute positively to employee performance and satisfaction. (Thatcher & Milner, The impact of a 'green' building on employees' physical and psychological wellbeing, 2012). Artificial lighting in a green building is also designed to supplement the natural lighting and increase overall light quality. Penetration of energy-efficient lighting systems such as LED reduces the amount of energy consumed while providing better lighting conditions to have a clearer focus and reduce errors. According to Abbaszadeh et al. (2006), green buildings equipped with efficient lighting systems report higher levels of employee satisfaction and productivity. (Thatcher & Milner, 2012) This is further supported by Singh et al. (2010), who noted that such improvements in lighting conditions lead to a more pleasant and productive working environment, resulting in reduced absenteeism and increased job satisfaction. (Singh & Syal, 2010). Armitage et al. (2006) emphasized that well-designed lighting systems in green buildings can enhance the aesthetic appeal of the workspace, which in turn can boost morale and create a more positive work atmosphere. (Thatcher & Milner, 2012). This aligns with findings from Thatcher (2012), who highlighted that aesthetically pleasing and well-lit environments are key factors in job satisfaction, as they contribute to a sense of well-being and comfort among employees. (Thatcher & Milner, 2012). Moreover, lighting in green buildings is often adjustable to meet the specific needs of different tasks, enhancing both comfort and productivity. As noted by Sadick et al. (2020), customizable lighting solutions in green buildings allow for the optimization of light levels, which can be crucial for tasks requiring high visual acuity. (Sariya Saengsawang, 2018) This flexibility in lighting design not only supports various work activities but also allows for a more personalized and satisfying work environment. (Kariyawasam & Ajani, 2023)

In the design of MAS Thurulie, several lighting strategies are employed to optimize natural light while minimizing glare and shadows, thereby enhancing the overall comfort and productivity of the workspace. The building features large windows and skylights positioned to maximize daylight penetration. The orientation of these openings is carefully planned to ensure that natural light reaches deep into the building's interior. This design not only reduces the reliance on artificial lighting but also creates a pleasant working environment. The integration of interior courtyards further amplifies the distribution of natural light. These open spaces allow daylight to diffuse effectively throughout the interior spaces, enhancing the lighting quality and creating visually appealing environments. To minimize glare and shadows, which can be distracting and uncomfortable, the building's orientation and design play a crucial role. The strategic placement of blinds helps control the intensity of natural light, preventing glare, while the presence of trees outside the windows serves as an additional measure to reduce glare and manage shadows. (Weerasinghe T. , 2023) (Weerasinghe S. , 2023) (Lokuliyana, 2024) (Kariyawasam & Ajani, 2023) (Leibundgut, 2009).The analysis of survey responses provides valuable insights into the impact of lighting on job satisfaction. The table below presents the mean and standard deviation for various aspects of lighting satisfaction.

Table 02: Lighting Satisfaction

Scale	Mean	SD
Natural Lighting	3.9	0.7
Artificial Lighting	3.2	0.8
Effectiveness for Work	4	0.6
Glare Frequency	3.6	1.1
Overall Lighting Conditions	3.8	0.9

(*Source: Survey Data*)

The mean score for natural lighting was 3.9 with a standard deviation of 0.7, indicating a generally positive perception among respondents. Many participants emphasized the beneficial effects of natural light on their well-being and productivity. For instance, one participant mentioned, "The natural light in my workspace makes me feel more energetic and less stressed throughout the day." This suggests that natural lighting plays a significant role in enhancing employee satisfaction and reducing stress. Artificial lighting received a lower mean score of 3.2 (SD = 0.8), reflecting mixed feelings among respondents. While some participants appreciated its effectiveness for work tasks, others found it less satisfactory compared to natural lighting. A respondent noted, "The artificial lighting is adequate for my tasks, but it can sometimes feel harsh, especially in the afternoons." This highlights the need for balancing artificial lighting to avoid discomfort while maintaining functionality. The effectiveness of lighting for work purposes was rated highly, with a mean score of 4.0 and a standard deviation of 0.6. This indicates that the lighting conditions are generally considered suitable for performing work-related tasks efficiently. Glare was identified as a significant issue, with a mean score of 3.6 and a higher standard deviation of 1.1, indicating variability in experiences. Glare affected overall satisfaction, as reflected in the feedback. One participant stated, "The glare from my computer screen due to the overhead lights is quite bothersome and strains my eyes." This suggests that glare management is crucial for improving lighting satisfaction. The overall lighting conditions received a mean score of 3.8 (SD = 0.9). While generally positive, the qualitative feedback pointed to areas for improvement. Comments such as "Natural light is the Energy for me, it keeps me alert and positive" and "Artificial lights could be softer " underscore the importance of optimizing both natural and artificial lighting to enhance comfort and satisfaction. The reliability analysis showed a high level of internal consistency for the lighting satisfaction scale, with a Cronbach's alpha of 0.82, suggesting that the scale is a reliable measure of lighting satisfaction. The correlation analysis revealed a significant positive correlation between lighting satisfaction and job satisfaction ($r = 0.45$, $p < 0.01$), indicating that higher satisfaction with lighting is associated with higher job satisfaction. A multiple regression analysis was conducted to predict job satisfaction based on lighting satisfaction. Lighting satisfaction was a significant predictor ($\beta = 0.27$, $p < 0.01$), emphasizing its importance in influencing job satisfaction. Structural Equation Modelling (SEM) was employed to test the hypothesized model. The model fit indices indicated a good fit (Chi-square (χ^2) = 145.32, df = 87, $p < 0.01$; CFI = 0.95; TLI = 0.94; RMSEA = 0.05), supporting the hypothesized relationships between lighting satisfaction and job satisfaction. The thematic analysis based on survey responses identified several key themes. Many respondents emphasized the positive impact of lighting, particularly natural lighting, on their job satisfaction and well-being. For example, one participant said, "Natural light is the energy for me, it keeps me alert and positive." While necessary, artificial lighting was less favorably received, with some respondents indicating it could cause discomfort.

3.3. THERMAL COMFORT

Thermal comfort in green buildings is a crucial factor that influences both employee well-being and productivity. Studies have demonstrated that thermal comfort, defined as the state of mind that expresses satisfaction with the surrounding environment, plays a significant role in occupants' overall satisfaction and performance. For instance, research by Sadick et al. (2020) indicates that thermal comfort is a primary component of indoor environmental quality (IEQ) that directly impacts job satisfaction (Abdul-Manan Sadick, 2020). In green buildings, where energy efficiency and environmental sustainability are prioritized, maintaining optimal thermal comfort can be challenging but is essential for ensuring a positive work

environment. The design and technology used in green buildings, such as advanced heating, ventilation, and air conditioning (HVAC) systems, are geared towards creating a comfortable thermal environment while minimizing energy consumption. Elnaklah et al. (2021) highlight that transitioning from conventional to green buildings does not automatically guarantee improved thermal comfort, as the effectiveness of these systems depends on their proper implementation and maintenance (Rana Elnaklah, 2021). Moreover, the relationship between thermal comfort and job satisfaction is well-established. Newsham et al. (2018) found that employees working in environments with controlled thermal comfort reported higher job satisfaction levels compared to those in less controlled settings. This correlation suggests that comfortable thermal conditions can enhance employees' perception of their work environment, leading to greater job satisfaction and potentially improving overall job performance. The positive impact of thermal comfort extends beyond immediate comfort, contributing to reduced absenteeism and increased productivity, as employees are less likely to experience discomfort-related distractions or health issues.

In MAS facilities, both production areas and office spaces utilize evaporative cooling units to sustain a comfortable environment. These units' function by drawing in fresh air, filtering it, and adding moisture to lower the dry-bulb temperature. The cooled air is then distributed through a network of ducts, maintaining positive static pressure in the spaces. Unlike systems that recirculate indoor air, this setup exhausts air through properly sized fans to effectively remove heat and moisture. The system achieves an air-exchange rate of about 40 changes per hour, with indoor air movement detectable at a minimum velocity of 0.8 meters per second. According to ANSI/ASHRAE Standard 55-2004, the thermal comfort zone can be extended by approximately 2.7°C with an indoor air velocity of 0.7 meters per second. This adjustment is depicted in the psychometric chart, showing an expanded comfort zone at higher air speeds, relevant to tropical climates based on ASHRAE 55-2004 guidelines. Humidistats in each cooling unit manage indoor humidity, keeping it at or below 80 percent. Employees typically dress in short-sleeve shirts and often go barefoot, which, combined with low metabolic activity and consistent air movement, contributes to a comfortable work setting. The highest recorded temperature on the ground floor of Building C is 29.5°C, which remains within the acceptable range due to the indoor air velocity of 0.8 meters per second, placing conditions within the extended comfort zone. Each evaporative cooler services one or two work teams, allowing them to control airflow and indoor velocity using five fan-speed settings. The balanced duct system, with its fixed diffuser arrangement, ensures consistent air velocity, while individual offices are equipped with adjustable diffusers to accommodate personal preferences. Larger office spaces feature multiple diffusers, enabling users to adjust airflow at their desks. The cafeteria benefits from natural ventilation due to its location on an upper floor overlooking a pond. The combination of a green roof and shade from surrounding trees helps to keep the environment cooler. Typically, natural breezes provide sufficient ventilation, eliminating the need for mechanical systems. (Leibundgut, 2009) (Lokuliyana, 2024) (Weerasinghe T. , 2023) (Weerasinghe S. , 2023) (Kariyawasam & Ajani, 2023). The descriptive statistics for the various aspects of thermal comfort are as follows.

Table 03: Thermal comfort Satisfaction

Scale	Mean	SD
Temperature Satisfaction	3.6	0.8
Frequency of Temperature Discomfort	4.1	1
Control Over Temperature	3.4	0.9
Comfort with Thermal Conditions	3.5	0.8
Overall Thermal Comfort	3.6	0.8

(*Source: Survey Data*)

The mean score for temperature satisfaction was 3.9, with a standard deviation of 0.8, indicating a Good level of satisfaction among employees. While the temperature was generally found to be comfortable, there was some variability in experiences. For example, one respondent noted, "The office temperature is usually comfortable, but there are times when it gets too cold or too warm." This suggests that while the thermal environment is often acceptable, occasional extremes in temperature can impact comfort. The mean score for the frequency of temperature discomfort was relatively high at 4.1 (SD = 1.0). This indicates that discomfort due to temperature fluctuations was a significant concern among respondents. A participant highlighted this issue, stating, "Frequent changes in temperature can be distracting and uncomfortable." This suggests a need for more consistent temperature regulation to reduce discomfort and enhance employee satisfaction. Control over temperature was rated lower, with a mean score of 3.4 and a standard deviation of 0.9. Many employees expressed a desire for greater control over the temperature in their workspaces. One participant mentioned, "Having the ability to adjust the temperature in my workspace would significantly improve my comfort and satisfaction." This indicates that personal control over the thermal environment could potentially lead to higher levels of comfort and satisfaction. The comfort with overall thermal conditions received a mean score of 3.5 (SD = 0.8), suggesting moderate satisfaction. While the conditions were generally acceptable, the variability in responses indicates that there are opportunities for improvement. The overall thermal comfort was rated similarly to temperature satisfaction, with a mean score of 3.6 (SD = 0.8). This reflects a general consensus that while the thermal conditions are satisfactory, there are areas that could benefit from enhancements, particularly in providing more personalized control. The reliability analysis demonstrated a high level of

internal consistency for the thermal comfort satisfaction scale, with a Cronbach's alpha of 0.81. This suggests that the scale is a reliable measure of thermal comfort satisfaction. A significant positive correlation was found between thermal comfort satisfaction and job satisfaction ($r = 0.42$, $p < 0.01$). This indicates that higher satisfaction with thermal conditions is associated with higher overall job satisfaction among employees. The regression analysis revealed that thermal comfort satisfaction significantly predicts job satisfaction, explaining 35% of the variance ($R^2 = 0.35$, $F(3, 176) = 31.5$, $p < 0.01$). The standardized beta coefficient for thermal comfort satisfaction was $\beta = 0.24$ ($p < 0.01$), highlighting its importance as a predictor of job satisfaction. The model fit indices from the structural equation modelling (SEM) showed a good fit with the data (Chi-square (χ^2) = 145.32, df = 87, $p < 0.01$; CFI = 0.95; TLI = 0.94; RMSEA = 0.05). These indices support the adequacy of the model in representing the relationship between thermal comfort satisfaction and job satisfaction. The thematic analysis identified key themes related to thermal comfort. While generally positive, there were instances of discomfort due to extreme temperatures. One respondent mentioned, "Temperature control is crucial; sometimes it's too cold, other times too warm." Many participants expressed a need for more control over the thermal environment, with comments like, "Having a personal thermostat would make a big difference in comfort." Frequent temperature fluctuations were a common issue, affecting concentration and comfort.

3.4. JOB SATISFACTION

The analysis of job satisfaction at MAS Thurulie reveals insightful patterns and correlations through various statistical measures.

Table 04: eNPS Chart

Scale	No. of Employees	%	Classification
0	2	1.11	Detractor
1	1	0.55	Detractor
2	3	1.6	Detractor
3	1	0.55	Detractor
4	7	3.88	Detractor
5	10	5.55	Detractor
6	12	6.66	Detractor
7	22	12.22	Passive
8	24	13.33	Passive
9	57	31.66	Promoter
10	41	22.77	Promoter

(*Source: Survey Data*)

Promoters (9-10): 98 employees = 54.44%
Passives (7-8): 46 employees = 25.55%
Detractors (0-6): 36 employees = 20%
eNPS = % Promoters - % Detractors = 54.44% - 20% = 34.44

Table 05: Employee job Satisfaction

Scale	Mean	SD
Overall Job Satisfaction	3.8	0.7
Work Environment Satisfaction	4.1	0.6
Productivity at Work	3.9	0.7
Work-Life Balance Satisfaction	3.7	0.8
Likelihood to Recommend Workplace	4.2	0.6

(*Source: Survey Data*)

The analysis of job satisfaction at MAS Thurulie reveals insightful patterns and correlations through various statistical measures. The Employee Net Promoter Score (eNPS) is notably high at 34.44, indicating a strong overall positive sentiment among employees, with 54.44% of employees categorized as Promoters. This high eNPS suggests that a substantial majority of the workforce is likely to recommend MAS Thurulie as a place to work, reflecting favourable perceptions of the workplace environment. The survey data on job satisfaction, captured through various scales, provides a comprehensive view of employee contentment. The overall mean score for job satisfaction stands at 3.8 (SD = 0.7), with satisfaction levels for specific aspects like work environment and productivity being slightly higher at 4.1 (SD = 0.6) and 3.9 (SD = 0.7),

respectively. Work-life balance satisfaction scores lower at 3.7 (SD = 0.8), suggesting room for improvement in this area. Reliability analysis for the Job Satisfaction Scale indicates a robust internal consistency with a Cronbach's alpha of 0.85. This reliability underscores the dependability of the survey results. Furthermore, correlation analysis reveals significant positive relationships between job satisfaction and factors such as lighting ($r = 0.45$, $p < 0.01$), ventilation ($r = 0.48$, $p < 0.01$), and thermal comfort ($r = 0.42$, $p < 0.01$). Respondents emphasized the positive influence of the supportive work environment and work-life balance on their overall job satisfaction. For instance, one participant noted, "The work environment is supportive and conducive to productivity, which makes me enjoy my job more." Additionally, comments on work-life balance, such as, "The company's emphasis on work-life balance is a major reason for my job satisfaction," underline the importance of these factors. Many employees also expressed a strong likelihood of recommending MAS Thurulie to others, with one stating, "I would definitely recommend working here; the environment and benefits are excellent." This qualitative feedback reinforces the quantitative findings, suggesting that a positive work environment and support for work-life balance are integral to employee satisfaction at MAS Thurulie. Further, the 20% figure highlights a significant proportion of participants who felt that comfort levels were enhanced due to the green building features. Also,15% figure indicates that a notable segment of interviewees linked the overall enhancement in job satisfaction to the improvements in the work environment.

3.5. COMPARATIVE ANALYSIS: IEQ SYSTEMS IN GREEN VS. NON-GREEN BUILDINGS AND THEIR IMPACT ON JOB SATISFACTION

A key factor driving higher job satisfaction in green buildings, like MAS Intimates Thurulie, lies in the advanced IEQ features that cater directly to occupant comfort, as opposed to the more rigid systems typically seen in non-green facilities. The hybrid ventilation strategy at MAS Thurulie, for example, combines natural and mechanical airflow, resulting in fresher air and a cooler environment without excessive energy consumption. In contrast, non-green buildings often rely solely on mechanical ventilation, which can lead to stale air and discomfort, reducing employee well-being and satisfaction (Sorkhan, Roumi , Zarandi, & Ganjouei, 2024). Additionally, the optimized use of natural lighting through large windows and interior courtyards provides a soft, evenly distributed light, reducing glare and eye strain that are commonly associated with purely artificial lighting in traditional buildings. This thoughtful integration of daylight also minimizes energy usage and aligns with natural circadian rhythms, positively influencing mood and productivity. For thermal comfort, MAS Thurulie's adaptive systems, which allow for localized temperature control and improved air circulation, create a more customized comfort level for employees. Non-green buildings, with their centralized and inflexible HVAC systems, often fail to meet diverse thermal preferences, leading to dissatisfaction (Ali & Akkas, 2024). Collectively, these green building features not only enhance comfort and health but also demonstrate an investment in employee well-being, fostering a more satisfying workplace environment than conventional settings typically provide.

4. Conclusion and Recommendation

The research on the impact of LEED-certified green building interiors on employee job satisfaction in Sri Lanka highlights a significant positive relationship between sustainable building features and employee satisfaction. The findings demonstrate that key elements of green building design, such as increased natural lighting, enhanced thermal comfort, and advanced ventilation systems, are closely linked to higher levels of job satisfaction. These results affirm that green building practices contribute not only to environmental sustainability but also to fostering a healthier and more productive work environment for employees. Future studies should explore in greater detail which specific components of green building interiors most significantly influence various aspects of job satisfaction, such as work performance, stress levels, and mental health. Comparative studies across different industries and geographical regions within Sri Lanka could provide deeper insights into the broader applicability of these findings, helping to contextualize the role of green buildings across diverse work environments. Additionally, long-term studies examining the impact of green building features on employee satisfaction and organizational performance would provide valuable data on the sustained benefits of these practices. Such research could lead to more tailored and effective solutions for creating workspaces that promote both environmental and employee well-being.

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