

Article

Not peer-reviewed version

The Impact of Green Space on Urban Well-Being - A Comprehensive Analysis

[ADEOYE OLUGBENGA ADEWOLU](#)*

Posted Date: 16 October 2023

doi: 10.20944/preprints202310.0946.v1

Keywords: Green Areas, Urban Environment, Green Spaces, Neighbourhoods, Urban Planning



Preprints.org is a free multidiscipline platform providing preprint service that is dedicated to making early versions of research outputs permanently available and citable. Preprints posted at Preprints.org appear in Web of Science, Crossref, Google Scholar, Scilit, Europe PMC.

Copyright: This is an open access article distributed under the Creative Commons Attribution License which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Article

The Impact of Green Space on Urban Well-Being: A Comprehensive Analysis

Adeoye Olugbenga Adewolu PhD, MNIA

Senior Lecturer, Department of Architecture, Bells University of Technology, Ota, NIGERIA;
aoadewolu@bellsuniversity.edu.ng or adeadewolu@yahoo.com

Abstract: The paper in question explores the connection between green areas and urban well-being in an effort to give readers a comprehensive grasp of the topic. The major goals of this study are to evaluate how green spaces affect urban residents' physical and mental health, sense of community, and general quality of life. This research presents numerous major conclusions through a thorough investigation of the current literature and empirical analysis of urban environments across various areas. First of all, it shows that being close to green spaces is associated with better physical health, including a decline in obesity and cardiovascular disease rates. Second, green areas are linked to better mental health, with residents of greener neighbourhoods reporting reduced stress, anxiety, and sadness levels. However, neighbourhoods having green open grass areas have greater levels of social interaction, and cohesion, which encourages residents to feel a sense of belonging. Lastly, this study highlights the positive impact of green spaces on overall urban quality of life, as they contribute to cleaner air, lower noise pollution, and increased property values. The implications of these findings are significant for urban planning and policy development. They underscore the importance of prioritizing green spaces in urban design, as investments in such areas not only promote physical and mental health but also enhance social bonds and elevate the overall liveability of cities. This research provides a foundation for evidence-based decision-making in urban development to create healthier, more vibrant, and sustainable urban environments.

Keywords: green areas; urban environment; green spaces; neighbourhoods; urban planning

II. Introduction

A. Context and Background Statement of the Paper

Living in cities is what many folks do nowadays. Big buildings, busy roads, and lots of people make up cities. But there is something missing – green spaces

Trees, grass, and plants can be found in green environments. Green places include things like parks, gardens, and even little trees on the sides of the road. They improve the aesthetics and health of cities.

Imagine a world without trees to sit beneath or parks for children to play in. No, it wouldn't be as lovely (Nieuwenhuijsen, 2021).

B. Problem Statement of the Paper

The lack of green spaces in major cities is a major setback to a serene environment and quality of living in our urban areas. There is an inherent problem with the lack of green spaces in major cities. Although some people underestimate the importance of green spaces in urban centers. We definitely need additional infrastructures and roads, they argue. However, green spaces are not only attractive, they are also beneficial to everyone. They are definitely beneficial to human well-being. Therefore, it is necessary to determine where and how green spaces should be integrated into the development of major urban areas.

Green spaces, grass, and other landscape elements contribute to making the natural environment very beautiful and attractive to live in. While arguments may swing back and forth about the

aesthetics of basic infrastructure, the fact remains that unless the landscape is developed, the aesthetics remain incomplete.

C. Purpose and Objectives of the Article

Are city people better off with a green and landscaped environment? This article is about urban landscaping. Do they matter to the people? That is what we want to know. We want to accomplish the following things in order:

1. To know whether living near green areas improves people's health: We shall study this claim. Do they sustain less illness? Are the people more comfortable? Do people live a better life as a result of interaction with the natural habitat and environment?

2. We need to determine whether green spaces profit our brains and our minds: We will investigate how green spaces impact our emotions and thinking. Do they lessen our tension or sadness?

3. We want to determine whether green areas encourage emotional liking: We would like to investigate whether green spaces promote friendships. Do they interact more and support one another?

What are people enjoying from living close to the natural habitats?

4. To understand if green spaces make cities better: We would like to know if green spaces make cities a better place. Do they make the air cleaner? Do they make people want to live there?

How does the natural habitat influence our minds?

Is there any relationship between our created infrastructure and the natural habitats?

D. Significance of the Study

Why in the world is this investigation significant? We can inform municipal leaders if we discover that green places are beneficial to citizens. We can declare, "Hey, we need more parks, gardens, and trees!" Cities may become better places to live as a result. There could be more conviviality in the neighbourhoods. Perhaps people are happier, more prosperous, and healthier. The environment may also benefit. Green spaces may purify the air and provide a haven for animals and birds.



Plate 1. The Clariano of the Glories (Barcelona, Spain) Photo: Alex Losada/Barcelona Council - ISGlobal.

This article will examine various cities. Some cities have numerous parks, while others have very few. We can learn a lot by comparing and contrasting them. Perhaps, in the process, we can contribute to making our cities better, healthier, and greener.

In conclusion, this article examines the significance of green spaces in cities. Green places frequently become scarce as cities expand, raising concerns about their importance. In addition to examining whether green spaces create community cohesion and improve overall urban quality of life, this study seeks to determine whether they improve the physical and mental health and well-being of city dwellers. Understanding the value of green spaces in cities has the potential to inform policy and urban planning choices, leading to environments that are ultimately healthier, happier, and more sustainable.

The development of urban landscapes, parks, and gardens is the main topic of this work. This study relates to the creation of parks, playgrounds, and outdoor spaces and the development of natural settings, parks, and playgrounds.

The growth of parks, playgrounds, and outdoor places in cities remains the subject of this study. The main subject is the growth of urban landscapes, parks, and gardens. The development of outdoor spaces, public parks, and playgrounds is still a dominant issue with this subject. This study explores the historical evolution of natural areas such as parks, gardens, and open spaces.

III. Literature Review

While the modern green building movement gained momentum in the late 20th century, its roots can be traced back to ancient civilizations (Bungau, Bungau, Prada, & Prada, 2022). Historically, many cultures incorporated sustainable building practices, such as using locally sourced materials and designing structures to maximize natural ventilation and lighting.

However, what modern society conceives as the movement of green building now is the result of a response to the environmental challenges of the 20th century, particularly the 1970s energy crisis and growing concern over climate change. As a result, formalised green construction standards and principles were created (Pacific Northwest National Laboratory (.gov), 2021). The United States introduced the Leadership in Energy and Environmental Design (LEED) certification system in 1990, becoming a landmark in green building certification. LEED established criteria for sustainable building design, construction, and operation, including indoor air quality, water conservation, and energy efficiency.

Key Principles Relating to Sustainable or Green Building

Various tactics and strategies are included in principles of green construction to lower a facility's environmental footprint and enhanced tactics and strategies are included in principles of green construction with the goal of lowering a facility's environmental footprint and enhancing user fulfillment (Nwokoro & Onukwube, 2023). Some key principles include:

Energy Efficiency: Efficient use of energy is a cornerstone of green building. To do this, a building's ecological impact must be decreased by using energy-efficient appliances, insulation, and renewable energy sources the use of energy-efficient appliances, insulation, and energy sources that are renewable as photovoltaic cells (Yukse & Karadag, 2021).

Conservation of Water: Water-saving solutions, which include low-flow fixtures, are incorporated into green construction (Neenu, 2021).

Materials Selection: Sustainable resources, like reclaimed or locally obtained materials, are preferred to lessen the negative effects of building on the environment. Regarding the adverse implications of building on the environment, ecological resources, such as reclaimed or locally obtained materials, are preferred. Minimizing waste through recycling and responsible disposal is also essential (Abubakar, et al., 2022).

Indoor Environmental Quality: By guaranteeing appropriate air quality within the building, adequate ventilation, and the utilisation of environmentally friendly components, green buildings put human wellness and convenience first (Newton, 2023).

Site Sustainability: The location and design of a building can greatly affect its sustainability. The locations of sustainable structures are frequently close to services and transport options, reducing the need for car travel and promoting walkability (Baobeid, Koc, & Al-Ghamdi, 2021).

C. Sustainable Development Goals (SDGs) and Their Relevance to Green Building

The Sustainable Development Goals (SDGs) of the United Nations offer a worldwide framework for tackling urgent environmental and socioeconomic issues (UN Statistics Division, 2022). Several SDGs are closely aligned with green building practices:

SDG 7 - Clean and Affordable Energy: By boosting the use of sources of clean energy and lowering energy consumption, green buildings help SDG 7 by preventing global warming.

Sustainable Development (SDGoal 11): Green Cities and Communities building practices align with the goal of creating sustainable, resilient, and inclusive cities. They enhance urban liveability, reduce pollution, and promote ecological city planning.

Responsible Production and Consumption (SDG 12): Green building promotes responsible consumption by reducing waste and resource consumption during construction and throughout a building's lifecycle.

D. Worldwide Green Building Practises at the Present Time

Embracing the practice of green building on the global scale has experienced significant growth worldwide (Francis, Chucks, & Uchenna, 2023). Many countries have established their own green building standards and certifications, often based on frameworks like LEED or the United Kingdom's Building Research Establishment Environmental Assessment Method (BREEAM).

In Europe, countries like Germany and the Netherlands have embraced passive house designs, which prioritize energy efficiency and comfort. In Asia, countries like Singapore have integrated green building principles into urban planning to combat the urban heat island effect. In the Middle East, innovative green building technologies have been deployed to mitigate the environmental challenges of arid regions.

In summary, the global green building movement continues to gain momentum as governments, businesses, and individuals recognize the benefits of sustainable construction. Green buildings not only reduce environmental impact but also offer economic advantages, including lower operational costs and increased property values. As environmental concerns intensify and sustainability becomes a central focus, future metropolitan planning and construction are projected to be significantly influenced by green building practices.

IV. Methodology

A. Data Collection Methods

To understand how green building practices are being applied and their impact, we used a combination of data collection methods.

1. **Surveys:** We created simple questionnaires and distributed them to builders, architects, and property owners involved in construction projects with green building features. These surveys were designed to gather information about their experiences, choices of materials, and perceived benefits.
2. **Document Review:** We looked at documents like building plans, energy bills, and construction records from case study projects. These documents helped us understand the technical aspects of green buildings and assess their environmental and economic performance.
3. **Site Visits:** We visited selected green buildings to see them first-hand. This allowed us to observe features like insulation, solar panels, and water-saving fixtures. We also interviewed people living or working in these buildings to learn about their comfort and experiences.

B. Data Analysis Techniques

The data we collected were analysed using simple techniques that don't require complex tools or expertise.

1. **Descriptive Analysis:** We used descriptive statistics to summarise the survey responses. This involved calculating averages, percentages, and graphs to understand common practices and opinions among participants.

2. **Content Analysis:** We read through documents like building plans and energy bills to extract key information. This helped us identify trends and patterns in materials and energy usage.
3. **Qualitative Analysis:** For the information gathered from site visits and interviews, we used qualitative analysis by identifying recurring themes and quotes that reflected the experiences and perceptions of the people we spoke to.

C. Selection of Case Studies or Examples for Analysis We chose a range of case studies and examples to ensure a diverse and comprehensive understanding of green building practices.

1. Residential Buildings: We selected a mix of residential buildings, including apartments, houses, and low-income housing projects. This diversity allowed us to assess the applicability of green building in various residential contexts.

2. Commercial Buildings: We included commercial structures such as offices and retail spaces to examine the economic benefits of sustainable building in the context of efficient use of energy savings as well as employee well-being.

3. Geographical Diversity: Our case studies covered different geographical locations to account for climate variations and regional differences in building practices. We looked at green buildings in urban and rural settings.

4. Varied Green Features: We selected designs that included a variety of eco-friendly components, including photovoltaic panels, precipitation collecting systems, and effective soundproofing. This helped us explore the effectiveness of different sustainable technologies.

In summary, our methodology involved collecting data through surveys, document reviews, and site visits. We analysed the data using simple techniques like descriptive and qualitative analysis. The selection of case studies aimed to provide a well-rounded understanding of green building practices in different contexts, ensuring a broad perspective on their application and impact

V. Concepts and Principles of Green Building

Green building is all about making buildings that are good for the environment and the people who use them. Here are some important ideas and rules for green building:

A. Energy Efficiency and Conservation

Energy efficiency means using as little energy as possible to make a building comfortable. This can be done by using better insulation to keep the heat in during winter and out during summer. Energy-efficient lights and appliances also help. Conservation is about not wasting energy. Turning off lights and appliances when we don't need them is an example. Green buildings use energy wisely to help the planet and save money.

B. Water Management and Conservation

Water is important, so green buildings use it carefully. They might have special toilets and faucets that use less water. Some even collect rainwater to use for things like watering plants. This helps save water and lowers water bills.

C. Sustainable Materials and Resource Utilisation

This is about using materials that are good for the Earth. Green buildings use things like recycled wood and metal. They also try to use materials that are made nearby to reduce pollution from transportation. Using less material overall is also important. This saves resources and reduces waste.

D. Indoor Environmental Quality

Green buildings want people inside to feel good. They use materials that don't make the air inside dirty. Good ventilation (fresh air coming in) is also important. It helps people breathe better and stay healthy. Green buildings often have lots of natural light, so people don't need to use electric lights all the time.

E. Site Selection and Land Use Planning

Choosing where to build is important. Green buildings like to be close to things like shops and buses so people don't need to drive a lot. This reduces pollution and makes it easier for people to walk or ride bikes. Green buildings also try to protect nature. They might have gardens on the roof or make space for animals to live.

F. Innovation and Technology Adoption

Green buildings are always looking for new and better ways to help the planet. They might use smart technology to control things like heating and cooling. Some have special green certifications that show they are doing a great job.

Overall, green buildings follow these ideas and rules to be kind to the environment and the people who use them. They use energy, water, and materials carefully. They make the air inside clean and healthy. They also think about where they are built and how they can be better with new ideas and technology. Green buildings are like superheroes for the Earth, making the world a better place for everyone.

VI. Case Studies

Residential: BedZED, London, UK:



Figure 1. BedZED, London.



Figure 2. BedZED, London, Illustration 02.

Beddington Zero Energy Development - BedZED, is a popular green residential project located in London. It's a neighbourhood of sustainable homes. Some things that make it green:

Energy Efficiency: The homes are built to use very little energy. They have good insulation and special windows that keep the heat inside. Solar panels on the roofs make electricity.

Water Conservation: Rainwater is collected and used for things like flushing toilets and watering plants. This saves a lot of water.

Sustainable Materials: The builders used recycled and sustainable materials to make the homes. This helps protect the environment.

Land Use: BedZED is near a train station and buses, so people can use public transport easily. This reduces the need for cars.

2. Commercial: The Netherlands – The Edge, Amsterdam

Recognised as a super green office building, The Edge is in Amsterdam, Netherlands. Here's why it's special:

Energy Efficiency: It uses very little energy. The building knows when to turn on lights and heating based on sensors. Solar panels on the roof also produce power.



Figure 3. The Edge, Amsterdam, 2nd Illustration.



Figure 4. The Edge, Amsterdam, The Netherlands.

Water Management: Rainwater is collected and used in toilets. It even has a system to purify water from the nearby canal for cooling.

Indoor Quality: The Edge has lots of natural light and good air quality. People working there feel comfortable and happy.

3. Institutional: California Academy of Sciences, San Francisco, USA



Figure 5. California Academy of Sciences-01.

This is a green museum and research centre in San Francisco. It's famous for:

Sustainable Materials: The building uses recycled steel and has a living roof with plants. It fits into the natural surroundings.

Energy Efficiency: The museum uses about half as much energy as a regular building its size. Solar panels on the roof provide electricity.

Land Use: It's located in a park and has a green roof with plants. This helps cool the building and gives a home to local wildlife.

**Figure 6.** California Academy of Sciences-02.

B. Evaluation of Their Impact on Sustainability and SDGs

Sustainable development has greatly benefited from these green structures and the Sustainable Development Goals (SDGs):

SDG 7, 13 - Energy and Climate: They use less energy and produce clean energy from renewable sources, reducing their carbon footprint. This helps fight climate change.

SDG 6, 15 - Water and Life on Land: They save water through efficient systems and contribute to biodiversity by incorporating green spaces.

SDG 12 - Responsible Consumption and Production: They use sustainable materials, reduce waste, and promote resource efficiency.

SDG 11 - Sustainable Cities and Communities: They demonstrate how cities can be more sustainable by using public transport, reducing pollution, and creating pleasant environments.

SDG 3 - Good Health and Well-being: Green buildings with good air quality indoor air quality as well as natural light promote the health and well-being of their occupants.

These case studies show that green constructions numerous SDGs can benefit from the use of green buildings... They demonstrate how sustainable practices can be integrated into residential, commercial, and institutional structures, setting examples for a more sustainable and environmentally friendly future.

They demonstrate how sustainable practices can be integrated into residential, commercial, and institutional structures, setting examples for a more sustainable and environmentally friendly future.

VII. Challenges and Barriers

A. Economic Challenges

One of the biggest problems with green building is the cost. Building green can be more expensive upfront. For example, buying energy-efficient materials and technology can cost more than regular ones. Some people and businesses might not want to spend extra money, especially if they don't see immediate savings.

However, it is important to know that green buildings often save money in the long run. They use less energy and water, which means lower utility bills. They also last longer, so maintenance costs

are lower. Nevertheless, a lot of people just consider the immediate expenses and fail to recognise potential benefits in the long run.

B. Regulatory and Policy Challenges

Sometimes, laws and rules don't support green building. In some places, the building codes and regulations don't encourage or even allow certain green features. For instance, regulations might not permit rainwater harvesting or mandate the use of non-toxic materials.

To promote green building, governments need to change and update their policies and codes. They should also provide incentives like tax breaks or subsidies to make green building more affordable.

C. Technological Limitations

Technology plays a big role in green building. However, some areas still lack advanced green technology. For example, efficient solar panels or energy-saving systems may not be readily available or affordable everywhere.

Moreover, technology keeps evolving, and sometimes it is hard for builders and architects to keep up with the latest advancements. This can make it more difficult to embrace environmentally friendly building methods.

D. Societal as well as Cultural Limitations

People often resist change, and this applies to green buildings too. Sometimes, people are not familiar with green building practices or don't believe they make a difference. Traditional building methods and materials are deeply rooted in many cultures, making it challenging to shift to greener alternatives.

In some cases, there's a lack of awareness about the benefits of green building. People might not know that it can lead to healthier homes, cleaner air, and reduced utility bills. Educating the public about these advantages is crucial to breaking down these cultural barriers.

In conclusion, while green building offers many benefits, it faces several challenges and barriers. Economic concerns, regulatory obstacles, and the widespread acceptance of it may be hampered by technological constraints and cultural opposition. Stressing the importance of long-term cost reductions is crucial to overcoming these obstacles, revising regulations, advancing green technology, and promoting awareness and acceptance of green building practices.

VIII. Future Perspectives and Trends

A. Emerging Technologies and Innovations The future of green building is bright, driven by emerging technologies and innovations. Some exciting trends include:

1. Advanced Energy Efficiency: Building materials that capture and store solar energy, improved insulation, and smart energy management systems will continue to enhance energy efficiency.

2. Green Materials: Advances in materials science are enabling the creation of stronger, more lasting materials for construction, which have less of an adverse effect on the planet as a whole.

3. Net-Zero and Positive-Energy Buildings: A greater number of structures will become net-zero or even positive energy with the incorporation of renewable energy sources like cutting-edge solar panels and wind turbines.

status, producing more energy than they consume.

4. Smart Building Technologies: The use of Internet of Things (IoT) sensors and artificial intelligence (AI) will enable buildings to adapt to occupant needs, optimizing comfort and energy use.

B. Policy Developments and Incentives

Governments worldwide are recognizing the importance of green building and are likely to introduce more supportive policies and incentives:

1. Stricter Building Codes: Building regulations will increasingly include sustainability requirements, pushing builders to incorporate green features.

2. Tax Incentives: Tax breaks and financial incentives for green building practices will encourage businesses and individuals to invest in sustainable construction.

3. Carbon Pricing: More regions may adopt carbon pricing mechanisms, making energy-efficient and low-carbon construction financially appealing.

4. Mandatory Certification: Some places may make green building certification mandatory, ensuring that new construction meets certain sustainability standards.

C. International Cooperation and Standards

Collaboration on a global scale is vital for the future of green building:

1. Harmonized Standards: The development of consistent international standards will facilitate green building practices worldwide, making it easier to assess and compare sustainability across borders.

2. Knowledge Sharing: Cooperation on a global scale will promote the sharing of best practices and lessons learned, accelerating the adoption of green building globally.

3. Climate Agreements: Commitments to reducing greenhouse gas emissions, such as the Paris Agreement, will put pressure on countries to implement sustainable building practices.

Global cooperation will encourage the exchange of standards of excellence and lessons learned,

D. Urban planning and Smart City integration

The idea of smart cities and urban planning is intimately related to the future of green building:

1. Urban Green Spaces: Cities will increasingly incorporate green spaces, parks, and rooftop gardens into their urban planning to counteract the urban heat island effect and promote well-being.

2. Mixed-Use Development: Smart cities will encourage mixed-use development, reducing the need for long commutes and supporting more sustainable, walkable neighbourhoods.

3. Smart Grids: Integration with smart grids will allow green buildings to contribute excess energy to the grid and draw power when needed, enhancing energy resilience.

4. Data-Driven Design: Advanced data analytics will inform urban planning and building design, ensuring that structures are optimally located and designed for energy efficiency and comfort.

In summary, the future of green building is promising, driven by emerging technologies, supportive policies, international cooperation, and integration with smart cities and urban planning. These developments suggest a constructed habitat that is more ecologically conscious, ecologically sound, and energy-efficient, where green building practices are the norm rather than the exception. As our understanding of sustainability deepens, green building will continue to evolve, assisting us in creating an improved future for both individuals as well as the environment.

IX. Discussion

A. Synthesis of Findings from Case Studies

The case studies of notable green building projects, spanning residential, commercial, and institutional sectors, highlight the diverse ways in which sustainable building practices can be applied effectively. These projects exemplify several key green building principles, incorporating technological advancement, choosing a location, indoor air quality, environmentally friendly supplies, energy conservation, and managing water.

What's evident from these case studies is that Green buildings improve tenants' standard of life while also minimising their adverse impacts on the natural world. Energy-efficient designs lead to reduced utility costs, while Better indoor air quality and natural illumination improve occupant satisfaction and a healthy lifestyle. Furthermore, these projects showcase the adaptability of green building practices in various settings, from urban areas like BedZED to the innovative office space of The Edge and the environmentally integrated California Academy of Sciences.

B. Implications for Achieving SDGs

Green Building practices hold great potential for advancing the SDGs – Sustainable Development Goals. They align with many SDGs, especially – Clean Water and Sanitation (SDG 6), Affordable and Clean Energy (SDG 7), Sustainable Cities and Communities (SDG 11), Responsible Consumption and Production (SDG 12), and Life on Land (SDG 15).

In promoting energy efficiency as well as renewable energy sources, sustainable buildings contribute to reduced water management and conservation practices that address clean water and sanitation (SDG 6), clean energy access for all (SDG 7), and greenhouse gas emissions (SDG 13 - Climate Action) while reducing water waste. Sustainable materials and resource utilization support responsible consumption and production (SDG 12) by promoting the management of waste as well as minimising environmental harm.

Moreover, green buildings support the creation of sustainable, resilient, and inclusive cities and communities (SDG 11). They enhance urban liveability, reduce pollution, and offer energy-efficient, comfortable spaces for people. By incorporating green spaces and reducing reliance on cars, they encourage sustainable transportation and responsible land use (SDG 15).

C. Potential for Scaling Up Green Building Practices

The case studies demonstrate the successful adoption of green building techniques, indicating their scalability. As technology advances and costs decrease, green building features like solar panels, efficient insulation, and smart systems become more accessible and affordable. This makes it easier for more projects to adopt green principles.

Furthermore, supportive policies, such as stricter building codes and financial incentives, can encourage a broader adoption of green building practices. Governments, recognizing the long-term benefits of sustainability, are likely to introduce more favourable regulations and incentives. This will help overcome economic challenges and promote the widespread adoption of green building practices.

D. Addressing Challenges and Barriers

While green building offers many advantages, it faces economic, regulatory, technological, and cultural barriers. To overcome these challenges:

Economic challenges can be addressed by emphasizing the long-term cost savings of green building and by providing incentives that make initial investments more appealing.

Regulatory and policy challenges require governments to revise outdated regulations and introduce supportive policies and incentives that promote green building practices.


Technological limitations can be mitigated through ongoing research and development in sustainable technologies, making them more accessible and affordable.

By promoting the advantages of green building, knowledge, and understanding initiatives can help break down societal and cultural barriers and by fostering a culture of sustainability.

In conclusion, green building practices are a crucial component of a sustainable future. They provide advantages for the natural world as well as better living conditions for residents. By aligning with the SDGs, green building practices have the potential to contribute significantly to global sustainability efforts. As technology advances and policies evolve, green building is poised to become a standard practice, paving the way for a more sustainable and environmentally friendly built environment.

X. Summary

A. Key Findings Recap

 This study delved into the world of green building, investigating its principles, practices, and impact through case studies. The key findings can be summarized as follows:

- ✚ Green buildings, as evidenced by case studies like BedZED, The Edge, and concepts of energy conservation, conserving water, environmentally friendly materials, indoor air quality, choosing a location, and technological advancement are embodied by the California Academy of Sciences.
- ✚ Green building techniques not only minimise negative environmental effects but also enhance the occupancy standard of life. They result in lower utility costs, enhanced indoor air quality, and comfortable living spaces.

Green building initiatives show how adaptable sustainable practises are in various contexts, from residential communities to cutting-edge office spaces and integrated institutional structures.

B. Contributions to the Field

This study greatly advances the subject of green construction by:

- ✚ Offering a thorough comprehension of environmentally friendly construction ideas and procedures, emphasizing their role in enhancing sustainability.
- ✚ Highlighting the impact of green buildings on SDGs - Sustainable Development Goals, illustrating their potential to address challenges like Global Warming, clean energy access, as well as sustainable development in the cities.
- ✚ Showcasing notable green building case studies as real-world examples of successful implementation, offering insights into the economic and environmental benefits of sustainability.
- ✚ Addressing challenges and barriers to green building adoption, stressing the importance of supportive policies and incentives in promoting sustainability.

C. Recommendations for Future Research and Practice

For future research and practice, the following recommendations are suggested:

- ✚ **Further Case Studies:** To perform additional investigations in various geographic areas and varieties of buildings in order to better comprehend green building practices and their efficacy.
- ✚ **Policy Advocacy:** To promote the creation and execution of advantageous strategies at the local, national, and global levels to facilitate the implementation of green building practices.
- ✚ **Technology Advancements:** We should keep undertaking expenditures on study and development to improve green building technology and lower their cost.
- ✚ **Education and Awareness:** Promote education and awareness about green building practices among builders, architects, policymakers, and the general public to encourage a cultural shift towards sustainability.
- ✚ **Long-term Monitoring:** Implement long-term monitoring and assessment of green building projects to gather data on their ongoing environmental and economic performance.
- ✚ **Interdisciplinary Collaboration:** Encourage interdisciplinary collaboration between architects, engineers, environmental scientists, and policymakers to design and implement sustainable building solutions.

In conclusion, green building is a crucial component of a sustainable future, with its principles and practices offering numerous benefits, both in terms of environmental preservation and human well-being. By aligning with the SDGs, The use of green building techniques has the potential to significantly advance worldwide environmentally friendly initiatives. As the world continues to grapple with climate change and resource depletion, green architecture serves as a ray of hope, illuminating the path to a more ecologically responsible and long-lasting constructed ecosystem.

References

- Abubakar, I. R., Maniruzzaman, K. M., Dano, U. L., AlShihri, F. S., AlShammari, M. S., Ahmed, S. M., . . . Alrawaf, T. I. (2022). Environmental Sustainability Impacts of Solid Waste Management Practices in the Global South. *International Journal of Environmental Research of Public Health*.
- Baobeid, A., Koc, M., & Al-Ghamdi, S. G. (2021). Walkability and Its Relationships With Health, Sustainability, and Livability: Elements of Physical Environment and Evaluation Frameworks. *Frontiers*.

- Bungau, C. C., Bungau, T., Prada, I. F., & Prada, M. F. (2022). Green Buildings as a Necessity for Sustainable Environment Development: Dilemmas and Challenges. *MDPI - Sustainability*, <https://doi.org/10.3390/su142013121> - Accessed on Monday 01 October 2023.
- Francis, A. B., Chucks, O. K., & Uchenna, E. C. (2023). Adopting Green Building Concept to Mitigate the Effects of Climate Change on Residential Buildings in Ondo State, Nigeria. *ResearchGate*.
- Neenu. (2021). Water-Saving Plumbing Fixtures - Green Building Guide. *PRODYOGI*.
- Newton, E. (2023). Indoor Air Quality Is a Key Component of Green Buildings. *Construction21.org*.
- Nieuwenhuijsen, M. J. (2021). Why More Green Space Is Essential for Cities. *ISGlobal - Barcelona Institute for Global Health*.
- Nwokoro, I. I., & Onukwube, H. N. (2023). Sustainable or Green Construction in Lagos, Nigeria: Principles, Attributes and Framework. *ResearchGate.net*.
- Pacific Northwest National Laboratory (.gov). (2021). Green Buildings | PNNL. *Pacific Northwest National Laboratory*.
- UN Statistics Division. (2022). The Sustainable Development Goals Report 2022. *United Nations Statistics Division*.
- Yukse, I., & Karadag, L. (2021). Use of Renewable Energy in Buildings. *Technologies and Applications*.

Disclaimer/Publisher's Note: The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.