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# Biophilic Design and Its Role in Improving Functionality For Administrative Buildings in Egypt

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**Abstract:** The sustainable design nature is one of the interior design strategies, which depends on taking advantage of the solutions found in nature, to address the problems of life of all kinds and in various fields, whether by designing interior spaces or designing furniture or at the level of architecture entirely, using new science that depends on the intersection of fields Designs of all kinds with basic sciences such as biology, chemistry, and mathematics, with the discovery of areas of cooperation and exchange of science inspired by the simulation of nature.

This has become the center of attention of many scientists, as they seek to understand the natural structures to be used in valuable applications, whether on the scientific, health, design, or interior space design levels. Therefore, nature is the renewable source of ideas that the designer benefits from while simulating lines and shapes and the mechanisms of their employment in spaces. This is a tool and strategy to achieve the sustainability of spaces and to find solutions to design problems through the processes of imitating nature, simulating its models, environmental systems, mechanisms of action, elements, and functions, and learning from its balanced genius and beauty that is made by the Almighty Creator. The elements found in nature are used as sources of inspiration for the aesthetic components of form, inspiration for designs and natural processes, and their application to man [1].

The conscious designer works to activate reality by simulating shapes to preserve existence within the concept of sustainability, by integrating them with organic engineering in nature and considering them as a source for designing workspaces. So, creating spaces that inspire, energize, and support the workers who use them is a global necessity today. Good health and well-being are one of the seventeen goals of the sustainable development program that the United Nations aspires to achieve by 2030. When sustainable work environments that support natural elements are available, they contribute to treating the physical and psychological health of workers and support production, creativity, and innovation, which leads to the success of institutions and companies and raises the economic return of the state.

**keywords:** Biophilia - biophilic design - biophilic design patterns - biophilic sustainability - conscious sustainable design - biomimicry - components of nature - ecosystem - green design - healthy design - human well-being - human contact.

## **I. Introduction**

Concepts that call for the quality of life achieved in luxury and achieving a level of general satisfaction with the life that individuals live by providing their basic requirements and accessing a measure of luxury have emerged recently. (Human well-being is a vital matter and a primary goal for development, as the human being, is one of the main sources of the economy, as the United Nations Development Program declared that “people are the true wealth of the nation and that the primary goal of development is to provide and create a suitable environment so that people can live for a long time, in good health and creativity). The difference is clear to us.” Between the concept of quality of life and sustainability, where sustainability is based on the principle of providing the needs of the present generation without affecting future generations, while quality of life is not limited to providing the needs of the individual, but includes achieving a degree of well-being for the individual. By achieving sustainability, we get a good quality of life, while achieving quality goals Life we get a better life, and the building in its traditional form can only provide its users with fixed and repetitive scenes, which impacts the individual’s intelligence, makes them bored, and negatively impacts his psychological and physical health, as the rate of productivity and intellectual creativity decreases, tension, anxiety, nervousness, headaches, and blindness, and many more..... Physiological and psychological symptoms that afflict the user of the internal environment are called symptoms of a sick building.

From this point of view, the biophilic design gained the motive and motivation on which its philosophy and patterns were based, as it is assumed that the human connection with nature is based on physical phenomena, coexistence, and mutual influence, which has a great impact not only on improving the level of human well-being but also alters the psychological aspects, physical health and increasing the rate of giving Productivity and creativity at work.

The administrative buildings were chosen because of the importance of these buildings stemming from their area and the number of occupants in them, whether from the employees who work in these buildings or from the public who visit these buildings. The most important factor in administrative buildings is that they are like a home for those who work in them, as they spend most of their day therefrom (8-12) hours a day, so the architectural design of the building influences their performance [2].

## **II. Research Problem**

The lack of design of administrative buildings for a production environment due to the lack of knowledge related to the characteristics and design elements of the internal environments that rejuvenate the health and support to improve work efficiency within the administrative offices. The neglect of the factor of human connection with nature and its living systems, and the neglect of the elements of environmental sustainability within the administrative buildings, produced for us brief administrative buildings in closed rooms with artificial lighting and long boring corridors that give rise to lethargy and boredom and negatively modify health, creativity, and productivity and miss the pulse of life and the spirit of nature.

Hence, it is clear that the administrative buildings need to reconsider the foundations and principles of their design and the integration of nature and environmental sustainability in them, and the application of the characteristics of sustainable biophilic design that works to provide a competitive work environment that is reflected in the performance and production of employees positively and also contributes to raising the economic return of the state. The causes of the problem are:

1. The lack of administrative buildings to include the natural environment within its architectural space, due to the lack of awareness of the designers of the importance of linking the phenomena of the internal environment with the phenomena of the overall environment surrounding the building, i.e., applying what the biophilic design aims at,
2. Ignoring the standard of user health and well-being when designing the interior environment of buildings, and poor employee productivity due to a lack of awareness of the very dangerous role that architecture and interior design play in the emergence of environmental and economic issues.
3. The negative impact on the elements and resources of nature.

### III. The Historical Context of The Biophile:

Man is distinguished by his belonging to nature and the rest of living beings, which is explained by the philosophy of nature, Alice Walker said, “In nature, nothing is perfect and everything is perfect; trees can twist and bend in strange ways and still be beautiful”. There is a deep inner connection between the human body and nature. People are creatures of nature and as such, they are beautiful regardless of any apparent flaw. We are like trees, crooked and strange, but still beautiful [3].

So, we feel comfortable when we are surrounded by nature, the natural world and the human body are made up of each other. Nature matches the human body to the smallest detail in one way or another. We notice from the pictures the similarity of human skin, lines, veins, texture, and colors with the wrinkles of trees and their leaves. We notice the similarity of the tree bark with the skin of the human back. All human details are similar to nature and its various elements in one way or another, which confirms the existence of a strong relationship between man and nature. We belong to nature because we are part of it, as we reflect nature and nature reflects us.



Figure (1) Pictures of human resemblance to nature  
<https://vulgarismagazine.com>

Biophilic is the reconnection between man and nature within the built environment, and biophilic design has an essential role to play in securing a healthy place to live and work. Biologist Edward Wilson interpreted it as man's penchant for nature and landscapes. The biophilic hypothesis explains why the landscape of a natural garden can enhance creativity, why shadows and heights give a sense of wonder, and why the company of animals and a picnic in the garden have therapeutic benefits. Biophilia also explains why we prefer some parks and urban buildings more than others [4].

The term biophilic was first coined by social psychologist Eric Fromm in his book *The Heart of the Man* in 1964. Then biologist Edward Wilson published the term in 1984 AD in his book *The Biophilia Hypothesis*. The strong relationship between people and the natural world has developed throughout human existence according to the theory of biophilia, which states that there is an innate link between humans and other living systems and makes people yearn to be closer to nature, not only by spending time outside but by bringing nature inside buildings [5].

### IV. Biophilic Design Elements

- 1.environmental features,
- 2.natural forms,
- 3.natural patterns and processes,
- 4.Light and voids,
- 5.relationships based on places,
- 6.The evolving relationships between man and nature.

### V. Benefits Of Biophilic Desig:

- 1) Incorporating biophilia into building design has several advantages:
- 2) reduces stress and anxiety,
- 3) improving physical health (keeping blood pressure stable and muscles relaxed),
- 4) restore cognitive and emotional energy,



- 5) feeling connected to others,
- 6) Eliminate pollution and maintain a clean environment,
- 7) Increasing productivity, enhancing creativity, and improving people's well-being,
- 8) Employees feel connected to nature, even though they are sitting in a building,
- 9) Reducing energy consumption by relying on renewable energies and preserving natural resources,
- 10) Helping patients recover from diseases and surgeries[6].

**Biophilic Design Properties**



figure (2) Direct relationship with nature



figure (3) Indirect relationship with nature



figure (4) Experiencing space and place

<p>Direct relationship with nature</p> <ol style="list-style-type: none"> <li>1) Daylight</li> <li>2) air</li> <li>3) Water</li> <li>4) Plants</li> <li>5) Animals</li> <li>6) the weather</li> <li>7) Fire</li> <li>8) Landscape and city systems</li> </ol>
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<p>Indirect relationship with nature</p> <ol style="list-style-type: none"> <li>1) Nature pictures</li> <li>2) Natural materials</li> <li>3) Natural colors</li> <li>4) Simulate natural light and air</li> <li>5) Simulate natural shapes</li> <li>6) Design inspiration from nature</li> <li>7) Richness of information</li> <li>8) Age and change according to time</li> <li>9) Natural engineering</li> <li>10) Biomimetic</li> </ol>
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<p>Experiencing space and place</p> <ol style="list-style-type: none"> <li>1) Expectation and Refuge</li> <li>2) Systematic complexity</li> <li>3) Combine the parts into a whole</li> <li>4) Transitional spaces</li> <li>5) Navigation and routes</li> <li>6) Cultural and ecological attachment to the place</li> </ol>
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**VI. Biophilic design and sustainability**

Biophilic design is a concept that promotes sustainability by strengthening the link between the built environment and the natural environment. Since the concept of sustainability is not only related to environmental protection but also has economic and social aspects, the concept of Biophilic Architecture focuses on designing a healthy interior space and linking it to sustainability. See (Bruno Duarte) in his study

"Beyond Sustainability - Biophilic and Regenerative Design In Architecture" are the concepts of biophilic design which are not separate from sustainability, and they work on different levels, but they share the same

goal to improve and renew living systems, linking people with nature, and making a positive change to earthly systems [8]. Biophilic design leads to positive feedback in terms of human functioning, health, and even emotional states. It aims to create environmentally friendly and energy-saving buildings using effective management of natural resources. Kellert also proposed the concept of "biophilic design", stressing the role and importance of buildings and landscapes in promoting the positive relationship between people and nature [9]. To achieve a more harmonious relationship between man and nature within the built environment, this is done through: first: reducing the negative effects of contemporary design and developing design systems that serve human health within the space, and second: promoting more positive communication between man and nature within the built environment[10].

It is clear from the foregoing that it is possible to identify three basic axes in achieving communication with nature within the sustainable biophilic interior space, and they include taking into account: the characteristics and characteristics of the natural environment, simulating natural forms and systems, investing the climatic and geographical characteristics of the site in a way that contributes to achieving the individual's sense of place and belonging to it [11].

**Examples of biophilic-designed administrative buildings:**

**Amazon headquarters (Seattle, USA)**



Figure (5) Nature inside the Amazon headquarters <https://designwanted.com/biophilic>

**Apple headquarters (California, US)**



Figure (6) Nature inside the Apple headquarters <https://www.fosterandpartners.com>

**Google headquarters (Mountain View, California, USA)**



Figure (7) Nature inside the Google headquarters <https://www.ngmiser.com>



Mountain View headquarters (Fifth Settlement / Cairo / Egypt)



Figure (8) Nature inside the Mountain View headquarters, <https://www.elwatannews.com>

VII. Biophilic Elements

The biophilic elements are based on which the administrative buildings were designed so that those in charge of them realize the benefit of linking man with nature to reach the highest productivity while achieving the comfort and health of employees and their sense of well-being and belonging to their workplace.










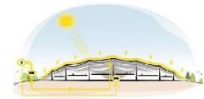


Check The Biophilic Element In The Administrative Buildings	Biophilic Elements	Check The Biophilic Element In The Administrative Buildings	Biophilic Elements	Check The Biophilic Element In The Administrative Buildings	Biophilic Elements	Check The Biophilic Element In The Administrative Buildings	Biophilic Elements
 Building integration at Airbnb HQ	Interactive Activities	 Streamlined in Cisco Offices	Streamlined Interior Spaces Influenced by Nature	 Amazon waterfall	Water	 Natural lighting inside Amazon	The Light
 Easy movement around the Airbnb HQ	Mobility and Ease of Movement	 Building integration at Airbnb HQ	The Integration of The Parts Into The Whole	 Plants improve the air quality in the Second	Improve Air Quality	 Plants inside Amazon	The Plants
 Fitting space for employees at Etsy Living	The Feeling of Containing Emptiness	 The Second Home was distinguished by its low energy consumption due to the presence of plants	Low Energy	 The Use of Stones and Wood in The Headquarters of The	Natural Materials	 Landscape at Amazon headquarters	Landscapes and Ecosystems
 Water Recycling at Google HQ	Water Recycling	 Solar panels at Google HQ	Use of Renewable Energies	 A meeting space shaped like a bird's nest inside the Amazon headquarters	Natural Shapes	 Natural Colors at Amazon HQ	Natural Colors

Table (1) biophilic elements. Source: the researcher

All of these elements support the quality of the internal environment on which the biophilic design is based on the interest in bringing nature to the internal environment, as it removes barriers between the internal environment and the natural external environment because of nature's positive impact on human health, comfort, and well-being, and thus on his productivity. So he proposed an evaluation called the biophilic evaluation.

VIII. Biophilic Rating System

It is a proposed system for evaluating sustainable administrative buildings. In this system, the building is evaluated in several stages: the design stage, the implementation stage, and the post-construction stage; Subject to undergoing evaluation during the design phase.



**IX. Objectives of the Biophilic Assessment System**

The system is the first step on the right path to achieving sustainability and supporting the application of biophilic architecture in Egypt. This system came to achieve a set of goals, including the following:







- 1) Providing a standard of good practice that assists in evaluating administrative buildings through a transparent and credible environmental classification.
- 2) Providing a reference specifying the environmental standards that must be observed in administrative buildings in all countries,
- 3) Reducing the negative environmental impact of administrative buildings, and encouraging innovative solutions that work to reduce it,
- 4) Encourage designers to pay more attention to the environment in administrative buildings, and raise awareness of the importance of sustainable biophilic administrative buildings,
- 5) Exploiting natural resources to ensure the preservation of the strategic reserve and the identity of the local environment,
- 6) Take advantage of the renewable energies available in each country,
- 7) Orientation to the need to pay attention to the comfort and psychological health of the users of administrative buildings, which is of general benefit to the state.








**X. Matrix for measuring the extent to which sustainable biophilic design elements are achieved within administrative buildings**

Biophilic design is an environmentally healthy design that promotes mental and physical health, reduces energy consumption, and promotes a healthy productive work environment. It is imperative that administrative buildings achieve compatibility with the environment, reduce negative impacts on the environment, and achieve energy efficiency by rationalizing energy consumption and employing negative environmental design methods, by relying on Natural lighting and ventilation, reducing thermal loads on buildings, using building materials that achieve thermal insulation efficiency as much as possible, and relying on clean renewable energies [12].


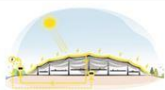
General Principles of Sustainability						Biophilic Architectural Elements
Energy	Technology	Indoor Environment al Quality	Economic Growth	Social Justice	Healthy Environment	
Reliance on renewable energies, solar energy, and wind energy.	The use of modern technologies to cool and heat the building to save energy consumption is used for these purposes	Indoor Environmental Quality (IEQ) refers to the efficiency and comfort of people living in interior spaces, as interpreted by the sum of their psychological and physical responses to architectural design factors.	Raise the efficiency of employees to improve productivity and thus raise production rates, which contributes to the process of economic growth of the state.	Preserving the health of employees and building users and achieving the highest rates of comfort, well-being, public health, and social bonds among employees.	Preserving a sustainable environment that improves human health and gives humanity continuity by reducing the use of materials and resources harmful to the environment at all stages of building construction.	
Energy consumption is reduced due to the rationalization of energy consumption in buildings through a balance between natural and artificial lighting.	Use skylights equipped with daylight sensors that turn on artificial lighting when natural lighting levels drop by a specified amount. Another design strategy relies on installing sensors on artificial lighting devices near natural light sources, which causes natural lighting devices to turn off when lighting levels reach a specific intensity.	The building is designed in the west-east direction so that the natural lighting sources are from more than one direction to enhance the lighting and reduce the heat gained.	Daylight helps provide visual comfort to employees and thus increase productivity.	Natural light is used to treat all disorders that affect humans and affect their performance.	Human exposure to daylight is beneficial to human general health.	 <p>Natural lighting inside Amazon</p> <p align="center"><b>Light</b></p>



The presence of water in the form of fountains works to soften the atmosphere and reduce electricity consumption.	Recycle water and use it in fountains and irrigate plants.	The quality of drinking water is an indicator of the quality of the indoor environment.	Increasing creative ideas and finding better solutions to various problems that support increased productivity.	Listening to the sound of water helps to increase creative ideas, as listening to the sound of water changes the brain waves into theta waves associated with the birth of creative ideas, and it also increases the chance of daydreaming during the day, which is a way to relieve the mind of pressure and tension and thus increase creative ideas and reach to better solutions to various problems.	Rationalizing water consumption and enjoying the presence of water in the form of waterfalls or fountains.	 Amazon waterfall	<b>Water</b>
The presence of plants works to soften the atmosphere and reduce electricity consumption.	Provide benches in the relaxation areas containing plants, and also a litter box containing plants feeding on nutrients obtained by decomposing waste (paper and foodstuffs).	The plant acts like a sponge and absorbs toxic chemicals in the vacuum, such as cigarette smoke, detergents, etc.	The plant can help reduce blood pressure, improve memory, reduce stress and thus increase productivity.	Plants have an impact on the mental health and mood of the employees, as they play a major role in improving the psychological state and feeling relaxed of the residents. In addition to its importance in purifying the air filled with many pollutants.	Exposure to green places is beneficial to human health.	 Plants inside Amazon headquarters	<b>Plants</b>
There may be wasted energy due to opening windows and ventilation, but the benefits are many.	Using a combination of different mechanical techniques to ensure proper ventilation (designing windows that can be opened and closed that are easy to control).	Use of carbon dioxide sensors to indicate insufficient ventilation rates.	Good ventilation improves health and therefore productivity.	Poor air quality negatively modifies employee productivity and causes "closed building syndrome", which includes feeling a group of symptoms, including headaches.	Connecting the spaces inside with the outside to get good ventilation, and the presence of plants purifies the air, and we enjoy healthy air.	 Plants improve the air quality in the Second	<b>Improve Air Quality</b>
Orientation to natural landscapes and ecosystems reduces our energy consumption.	The use of technology to bring a simulation of nature inside the building and within the workspace in the absence of direct contact with nature.	Add green or nature-like natural elements.	Taking into account the cost of landscapes that are added to the building so that we do not overburden the cost of the building.	Providing scenes with Arab Islamic values for a sense of belonging to the space and thus to the workplace as a whole, with the possibility of taking the opinions of employees in designing the space.	Preserving the nature of the place and respecting the terrain and making it part of the building.	 Landscape at Amazon headquarters	<b>Landscapes and Ecosystems</b>
Paying attention to energy generation technologies and the production of clean energy away from the use of fossil fuels and reducing the negative effects on the environment, leads to the production of environmentally friendly non-toxic products.	Green technology is the use of technology and science to provide products and services with high operational efficiency and low cost.	Natural materials are more sustainable than products made from synthetics, we must act positively towards the environment by using environmentally friendly materials that must be reliable and certified regarding the source material of their products.	Materials such as stone, brick, and wood have a durable strength, so furniture made from these materials will remain pristine and pristine for many years. The cost of used furniture and the cost of its maintenance must be considered.	The use of natural materials achieves relaxation and happiness, and the employee feels his belonging and love for the workspace, as the natural environment helps him feel more comfortable and relaxed.	Using natural and local resources and materials in ideal ways, avoiding environmentally harmful resources and materials, and avoiding the use of furniture that emits formaldehyde.	 The Use of Stones and Wood in The Amazon HQ	<b>Natural Materials</b>
Choose bright, light colors for furniture and wall paint, reflecting light. It helps to light stronger and thus rationalize the consumption of electrical energy.	Colors are found around us everywhere in nature, which is full of the most beautiful colors and even in ourselves. God Almighty created us with different skin colors, hair, and eyes, and the different colors give a distinctive aesthetic touch to everything. Colors have a positive effect on the psyche. The yellow color is one of the most vibrant and bright colors and is associated with positive energy and activity, being the color of the sun. The blue color gives the soul a sense of intimacy, relaxation, and calmness that makes employees more effective. The red color gives a sense of warmth, confidence, and vitality. Green is the color of nature and has a strong positive effect on the soul. In optimism and vitality.	Choosing the appropriate colors in the workspace helps to focus and stimulate the queen of creativity, as bright colors positively affect the users of the space.	Bright colors increase the activity and vitality of the space users, thus increasing their productivity, thus increasing the state's income.	Most colors have therapeutic effects that can be used to improve the health of space users. Among the therapeutic uses of some colors is the use of pink, which raises astonishment and affects the physical and mental state of the space user, as it is useful in curbing aggressive tendencies and reducing physical strength. As for the red color, it increases the pulse. Heart and respiratory rate and raise blood pressure, it has the benefit of increasing physical energy. The blue color tends to reduce the heartbeat so that it tends to calm down, so the soul relaxes, which leads to calm nerves and removes anxiety and tension. Yellow color strongly stimulates the mind.	Colors are among the environmental factors affecting human health, as they affect emotions and outlook on life and also affect the psychological happiness of the individual and society in general, as colors affect the treatment and prevention of several diseases.	 Natural Colors at Amazon HQ	<b>Natural Colors</b>

Our proximity to nature in its various forms saves our energy consumption.	The role of nature in enriching innovative ideas. The different forms of nature from which the designer invents different designs to reflect his philosophy on the foundations of design for one of the components of nature (the spiral ladder is taken from the idea of the logarithmic spiral).	Robotics in creating natural spaces within which the employee works, so he feels more positive, which reflects the quality of the work environment. Nature has a role in enriching his innovative ideas, as it is like an art museum that is open at all times and places.	The economic renaissance comes from the fact that there are innovation and imitation of nature in a vacuum in which man works.	Nature gives proof of what it means to be "creative." From one idea gives countless numbers of solutions and forms, we must innovate in creating natural spaces suitable for different workspaces.	Design is a vital building that must follow or take some characteristics of living organisms in nature and derive the most important principles and characteristics of construction from them, such as innovation, movement, growth, and flexibility. Therefore, the designer must draw inspiration from the principles of design from nature and living organisms.	 A meeting space shaped like a bird's nest inside the Amazon HQ	<b>Natural Shapes</b>
Reliance in these spaces on renewable energy.	Benefiting from technology in supporting flowing interior spaces and simulating them with nature.	Our proximity to nature formations supports environmental sustainability, which supports the quality of the indoor environment.	Everything that positively affects the user's comfort and well-being supports raising the level of productivity.	This supports the enhancement of the user's health and well-being by feeling close to the natural formations.	This biophilic element is achieved using design strategies that support visual connections between the interior spaces.	 Streamlined in Cisco Offices	<b>Human Inner Spaces Influenced by Nature</b>
Reliance in these spaces on renewable energy, such as solar energy, gives us light and a sense of bathing in the void.	Using technology to achieve communication between employees while achieving the privacy of each employee within the workspace.	The quality of the internal environment is verified by the visual links between all spaces that give rise to feelings of comfort and communication between employees, a sense of containing the space, and a sense of security.	The positive vibes generated from this item support improved productivity and work efficiency.	The sense of containing the void supports feelings of safety, security, and a sense of belonging to the void.	Achieving this vital element by using design strategies such as visual links between the interior spaces, a sense of security, and space containment.	 Fitting space for employees at Etsy Living	<b>The Feeling of Containing Emptiness</b>
Relying on renewable energy is needed for interactive activities such as lighting, ventilation, and electricity.	The use of technology that supports recreational activities within the workplace at the time of employee relaxation.	The presence of sound-isolated halls to provide spaces for employees to interact during their time of rest that provide comfort and brings feelings of happiness indicates the quality of the internal environment.	Generating these feelings supports raising work efficiency and increasing productivity.	Paying attention to employees by providing a work environment in which interaction and participation among all employees positively affect their comfort and happiness.	Interaction between employees during relaxation time creates a healthy relationship between the work team filled with love and respect.	 Building integration at Airbnb HQ	<b>Interactive Activities</b>
The openness of all the spaces of the building ensures the enjoyment of natural lighting, thus reducing energy consumption.	Use technology while supporting the integration of all parts of the building.	The integration of all parts of the building and the occurrence of openness between all spaces are indicators of the quality of the internal environment.	The integration of all spaces in the building creates a successful environment that increases the productivity of individuals and thus the renaissance of the country's economy.	Employee communication with each other ensures social justice and successful relationships among all employees.	The satisfactory integration of the space works on the communication of employees with each other, which provides a healthy environment for all users of the space.	 Building integration at Airbnb HQ	<b>Integration of The Parts with The Whole</b>
Ease of movement and openness between all spaces of the building guarantees natural lighting and thus reduces energy consumption.	Use technology while ensuring mobility and ease of movement.	What positively affects the comfort and well-being of employees ensures the quality of the internal environment.	What positively influence the comfort and well-being of employees ensures the quality and efficiency of production.	Mobility and ease of movement support employee comfort and well-being.	Mobility and ease of movement have a strong positive impact on the physical health, social well-being, and sense of satisfaction of users.	 Easy movement around the Airbnb HQ	<b>Mobility And Ease of Movement</b>
Low rates of energy consumption reduce the carbon emissions of the building.	Take advantage of technology to reduce energy consumption.	Sustainable design that achieves indoor environmental quality relies on low energy consumption.	Low consumption of energy used reduces the economic cost.	What guarantees social justice for every human being is low energy consumption and reliance on clean, renewable energies.	A successful sustainable design depends on low energy consumption for various purposes.	 Second Home was characterized by its low energy consumption due to the presence of plants	<b>Low Energy</b>



Relying entirely on renewable energies to meet the needs of the consumed energy.	Take advantage of technology to rely entirely on energy from renewable energies.	Successful sustainable design that achieves the quality of the internal environment depends entirely on the use of energy from renewable energy.	Reliance on renewable energies supports economic growth.	Every person has the right to have his energy consumption depend on renewable energies that do not negatively influence humans and all other living beings.	The successful sustainable design depends entirely on the use of renewable energies (sun and wind in Egypt) for all its energy needs.	 Solar panels at Google HQ	<b>Use of Renewable Energies</b>
Water recycling and utilization save the huge amount of energy used in transporting water.	Using technology that supports the water recycling process and making use of it.	The life cycle of water inside the building from the use of water and its recycling to benefit from it in other uses inside the building indicates the quality of the sustainable indoor environment.	Water recycling saves the cost of water consumption.	To achieve social justice, water must be preserved for future generations.	To ensure a healthy, sustainable environment, water must be preserved, the element of life on the planet.	 Water Recycling at Google HQ	<b>Water Recycling</b>

### VI. Advantages when adopting biophilic elements in the design of administrative buildings

- 1) Efficient use of energy and saving consumption by relying on natural ventilation and adding water and plant elements inside the spaces, which helps to moderate the temperature of the internal spaces, and benefit from alternative energies such as wind and solar energy.
  - 2) Preserving natural resources and water, the element of life, and recycling it.
  - 3) Trying to make the building an integral part of the natural environment in the external environment.
  - 4) Waste management in a way that preserves the environment and does not harm the natural environment to ensure the future of future generations.
  - 5) Achieving a clean, healthy indoor environment by relying on natural lighting and ventilation.
- Administrative buildings must be transformed into factories for innovation and creativity, and all their facilities must be based on nature.

I recommend the necessity of the participation of all parties to the urban system, which includes the state with its administrative and financial incentives, and the real estate developer with his developmental vision. To study the impact of each element on other parties, its feasibility, and the ability to respond to achieve it in a way that achieves the desired goals of biophilic design and does not take the husks from biophilic design thought.

### XIII. Findings and Recommendations

The research finds that the growing global interest in biophilic design and the human dimensions of sustainability is looking for a way to integrate nature and the characteristics of sustainable natural design in all buildings, as the design of buildings has a significant impact on human health, well-being, and work performance. It has discussed the possibility of including biophilic standards in the scope of sustainable designs for office buildings to ensure that its employees are not only healthy and happy, but also more innovative and productive. The creation of the building is not a conclusion, but a beginning and a catalyst for positive change. Development and design do not end with the delivery of final drawings and approvals, or even with the construction of the project. The responsibility of the conscious designer includes placing what is required during the design and development process to ensure the continuity of the continuous innovative capacity of the project and the people who inhabit and manage it over time. At this stage, the true potential of the building's systematic relationship with the surrounding natural environment can be realized.

Papophile architecture aims to: reduce the negative impact on the natural and built environment from the consumption of non-renewable resources, reduce the use of materials harmful to the environment, and reduce energy consumption according to the following points:



- 1) Achieving a healthy and comfortable internal environment: Biophilic architecture is concerned with designing buildings in a way that achieves a healthy and comfortable internal environment for users and with negative architectural methods that do not consume electrical energy in terms of bringing nature to all spaces, especially the administrative spaces under study, and access to the appropriate temperature, ventilation, and good natural lighting. And acoustic comfort and everything that makes a person feel happy, satisfied, and healthy inside this space.
- 2) Achieving energy efficiency: reaching buildings that consume the minimum amount of energy, taking into account the good design of heating, cooling, and lighting, and working on the use of renewable energies.
- 3) Rationalizing the consumption of materials and resources: working to reduce the depletion of sources of building and finishing materials, finding other alternative and renewable sources, avoiding materials that are harmful to humans or the environment, and using natural materials that provide comfort to the user space and do not harm the environment.
- 4) Achieving comprehensive design: Achieving efficiency and harmonizing the functional relationships between the parts of the project, land uses, traffic lines, movement, mechanical systems, and construction techniques so that all building spaces are harmonious and easy to move and move.
- 5) Treating pollution and disposing of waste in proper ways.
- 6) Good site selection and benefit from its potential and efficient land use.
- 7) Reducing human exposure to harmful and toxic substances.
- 8) By applying the above, we reach the comfort and health of the building's employees, which achieves the highest productivity, which leads to attracting new investments and creating more job opportunities, improving the citizen's income level, as well as lowering unemployment rates.

#### **XIV. Recommendations**

##### **Academic recommendations:**

- Developing educational materials that show the importance of biophilic design to increase the awareness of architecture students about bringing nature into the building.
- Encourages students of architecture in design subjects to pay attention to how space affects the mental health of users, as a factor in achieving a successful functional space.

##### **Recommendations for governments and decision-makers:**

- Spreading awareness about how the built environment impacts human mental and physical health and thus modifies productivity.
- Urging the government to support biophilic design by taking advantage of organizing competitions and incentive prizes to encourage the use of this design approach.
- Issuing laws to ensure the design of an appropriate human workspace.
- Encouraging institutions and companies that work to bring nature into indoor spaces by reducing the tax rate.

##### **Recommendations for institutions and business owners:**

- Achieving the basic principle of biophilic design by bringing as much nature as possible into the buildings, to maintain the psychological and physical health of employees.
- Encourage organizations and institutions to adopt the biophilic design approach in designing their workspaces, and disseminate the experience of existing buildings in which biophilic design elements have been applied.

I hope that these recommendations will help bring in the natural elements and integrate nature into the workspace in the administrative offices because this will give an atmosphere of calm, tranquility, and psychological comfort within the workspace, which leads to increased productivity and raised the economic situation of the state.

Our main goal is to enhance the well-being, health, and safety of employees at work. And the obligation to protect and promote human rights. We feel our responsibility towards the environment and the land by preserving it, marketing renewable energy, and using technologies that enable the efficient use and conservation of energy.

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