

Designing A Healthy Interior Through Appropriate Indoor Plants.

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Abstract

Indoor plants play a vital role in improving indoor environmental quality and human well-being. As people spend nearly 80% of their time indoors, air quality, comfort, and psychological health have become critical design concerns. Indoor plants contribute to cleaner air by reducing carbon dioxide, volatile organic compounds (VOCs), and particulate matter, while also increasing humidity to healthier levels. Beyond physical benefits, plants reduce stress, improve mood, enhance productivity, and support recovery from illness. This paper synthesizes existing research on indoor air pollution, the role of indoor plants in mitigating these problems, and the psychological and physiological benefits of interior plantation. It also provides practical guidelines for selecting, designing, and maintaining indoor plants in office and residential environments to promote healthier, more productive, and aesthetically pleasing interiors.

Key words: Indoor plants, Interior design, Indoor air quality, Employee well-being, Productivity, Green interiors, Biophilic design, Stress reduction, Psychological comfort, Low-maintenance plants

I. Introduction

Modern lifestyles have shifted human activity indoors, with work, leisure, and social interaction increasingly confined to enclosed spaces. In rapidly urbanizing countries like Bangladesh, the extensive use of synthetic construction and decorative materials has intensified indoor air pollution. Although indoor pollutant concentrations may be low, prolonged exposure leads to cumulative health risks, particularly for individuals with limited outdoor activity.

Indoor air pollution originates from building materials, furniture, smoking, human metabolism, microorganisms, and mechanical systems. These pollutants can cause respiratory irritation, headaches,

fatigue, allergies, and long-term health complications. As health awareness grows, there is an increasing need for eco-friendly interior solutions that enhance air quality and occupant well-being.

This research explores how interior design integrated with indoor plants can improve air quality, psychological comfort, and work efficiency. The study aims to demonstrate the effectiveness of interior plantation in office and residential spaces and to provide design and maintenance guidelines for creating healthy indoor environments.

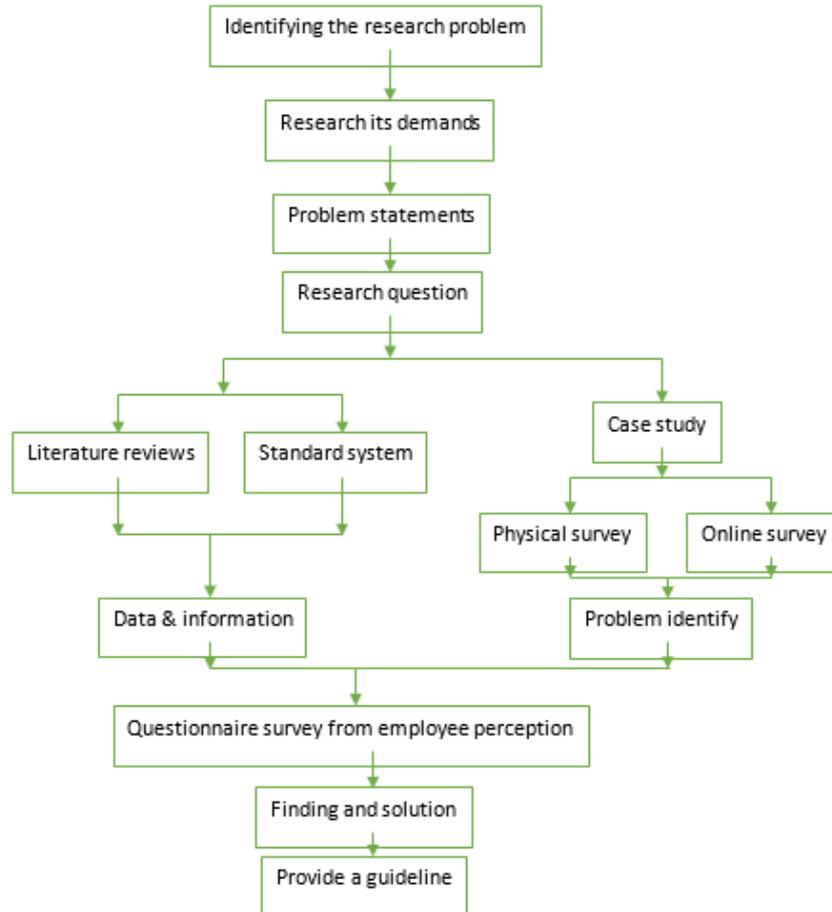
Sources of Indoor Air Pollution

Indoor air pollution is often more severe than outdoor pollution, with some studies indicating levels up to several times higher. More than 300 contaminants may be present indoors, and a significant proportion of human illnesses are linked to poor indoor air quality.

Major sources include human respiration and smoking, decorative materials and furniture, microorganisms, cooking fumes, electronic equipment, and air-conditioning systems. Human activities release carbon dioxide, odors, skin particles, and biological pollutants, while smoking introduces carcinogenic substances. Decorative materials such as paints, adhesives, plywood, and synthetic finishes emit harmful chemicals like formaldehyde, benzene, ammonia, and radon. Microorganisms, dust mites, and bacteria thrive in warm and humid environments, contributing to respiratory problems. Additionally, electronic devices and household chemicals introduce electromagnetic radiation and toxic residues into indoor spaces.

Long-term exposure to these pollutants negatively affects physical health, emphasizing the need for natural mitigation strategies within interior environments.

II. Methodology



III. Literature Review

Research consistently demonstrates that indoor plants enhance the environmental, psychological, and physical quality of interior spaces. Although early studies were primarily laboratory-based, recent field research confirms sustained benefits in real office and residential environments. Indoor plants improve air quality by reducing volatile organic compounds such as formaldehyde and benzene through plant absorption and root-zone microorganisms. They also increase relative humidity, reduce dust, and improve acoustic comfort. Psychological studies report reduced stress, improved mood, enhanced attention, and productivity increases of up to 15% in planted interiors. Health-related research further indicates faster recovery from illness, reduced pain perception, and fewer physical discomfort symptoms among occupants. These outcomes are explained by **biophilic theory**, which suggests that humans have an innate positive response to natural elements, making indoor plants a low-cost and effective strategy for improving interior well-being.

Interior Design with Indoor Plants

Indoor plantation involves the intentional integration of living plants into enclosed environments to promote eco-friendly, healthy, and visually balanced interiors. Once considered symbols of luxury, indoor plants now represent wellness-oriented and sustainable design practices. Functionally and

aesthetically, plants improve air quality, regulate humidity, soften architectural forms, and create calming spatial experiences. Successful application depends on thoughtful design planning, appropriate species selection, and regular maintenance.

Benefits of Indoor Plants

Indoor plants improve indoor air quality by absorbing carbon dioxide and pollutants, releasing oxygen, and increasing humidity. They reduce stress, enhance concentration, and support emotional well-being. Plants also contribute to higher productivity, reduced absenteeism, and improved job satisfaction. Additionally, they beautify spaces, define zones, control glare, and improve spatial experience.

Health and Well-being

Studies show that plants lower stress levels, reduce fatigue, and improve overall comfort. Exposure to greenery enhances pain tolerance, accelerates recovery from illness, and decreases common discomforts such as coughing, dry throat, and headaches. These benefits extend beyond aesthetics and are linked to physiological and psychological responses to natural elements.

Selection and Care of Indoor Plants

Effective interior plantation requires selecting plant species compatible with indoor environmental conditions, including light, temperature, humidity, water, soil, space, and structural load. Light quality and duration must meet plant requirements, supported by artificial lighting when necessary. Most indoor plants thrive in temperatures comfortable for humans. Proper watering, humidity control, balanced fertilization, lightweight planting media, and appropriately sized containers are essential to ensure healthy growth, structural safety, and visual harmony within interior spaces.

Case Study – 01

Office Name: Radio Next- 93.2fm

Type of office: Radio office

Address: RCC Tower (16th Floor, 17 Bir Uttam AK Khandakar Rd, Dhaka 1212

Founded: launched on 6th May, 2015

Owned and Run: Nitol–Niloy group.

Total Area: 8000 sft.

Ground Floor (Total Space- 360sft)

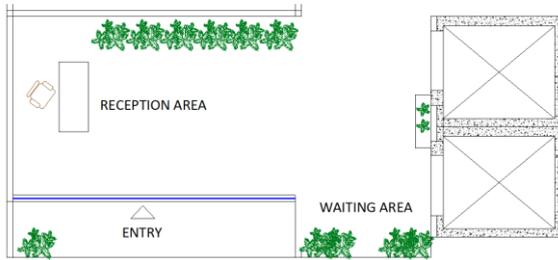


Fig: Ground Floor Plan.

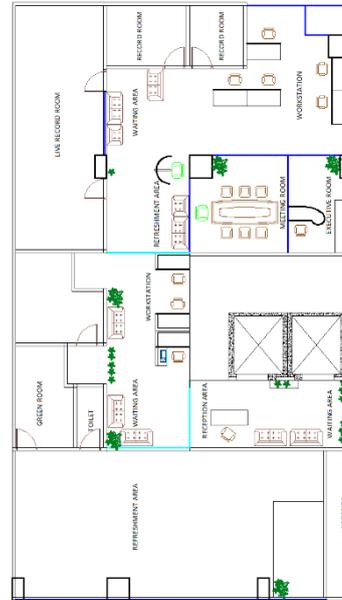


Fig: 5th Floor Plan.

5th Floor (Total Space- 3,000sft)

Information counter



Fig: Entrance



Fig: Information Counter



Fig: Reception Area



Fig: Reception Area



Fig: Reception Area



Fig: Waiting area



Fig: Refreshment area



Fig: Workstation



Fig: Workstation



Fig: CEO Room



Fig: Meeting space

Data analysis, observation and findings

Total questionnaires: 09.

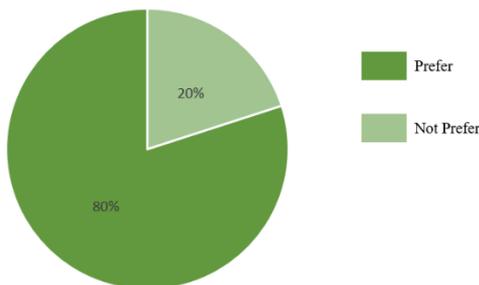
Total participants: 10 people

Surveyed types: 2 types (Corporate office and Residence)

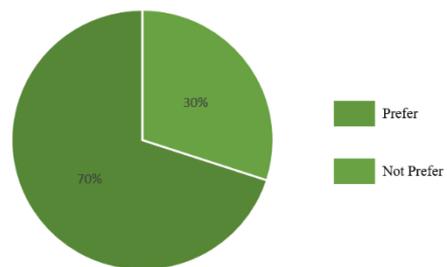
Survey methodology: About 10 employees from multiple types of offices were selected to complete the survey.

Where appropriate, some questions use it to show some chart box or pai chart. The responses to the questions were on a 10-point scale from very positive to 'very negative' for some part of the survey.

Question: User preference about natural green concept design in their space.

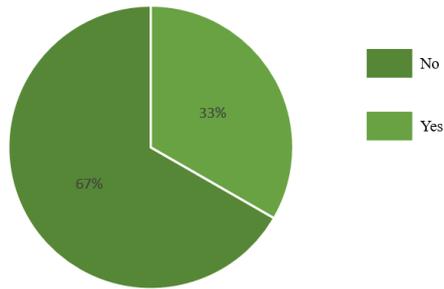


Office Interior

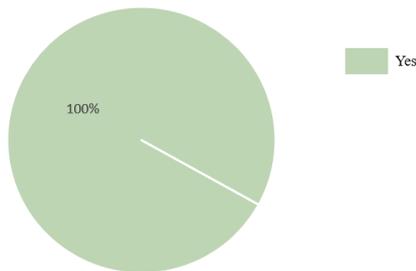


Residence Interior

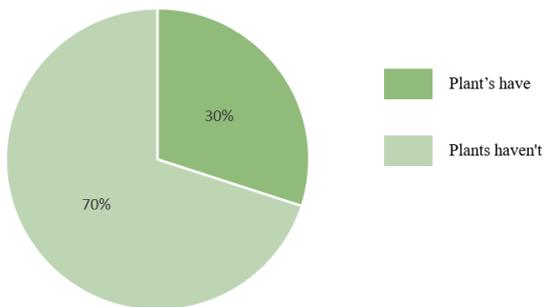
Question: Users knowledge about indoor plant



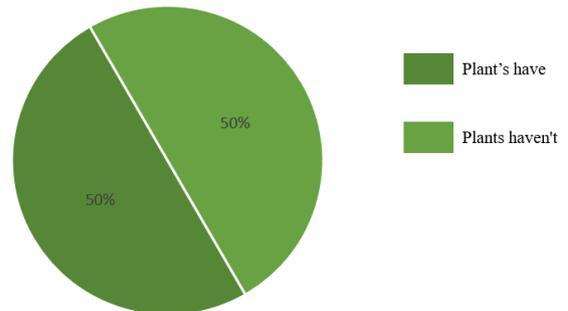
Question: Does adding indoor plants reduces the amount of air pollution an interior area?



Question: How much people have indoor plant in their interior?

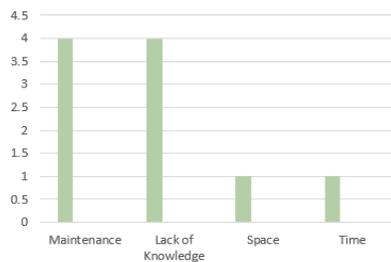


Office Interior

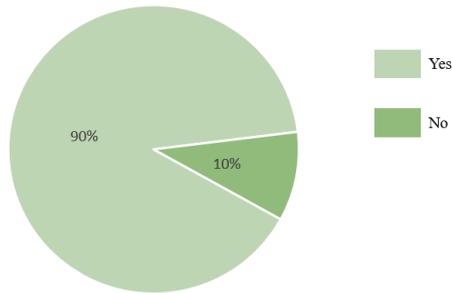


Residence Interior

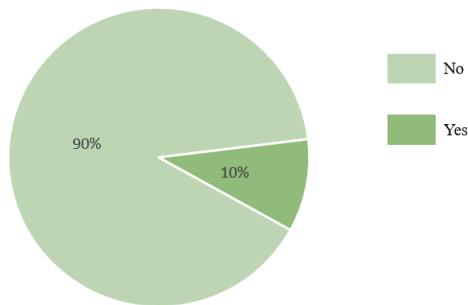
Question: What are the main reasons that people usually think indoor plants are not suitable.



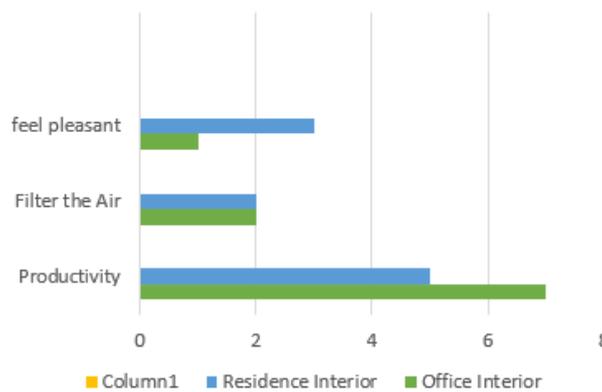
Question: User satisfaction of their natural green concept interior.



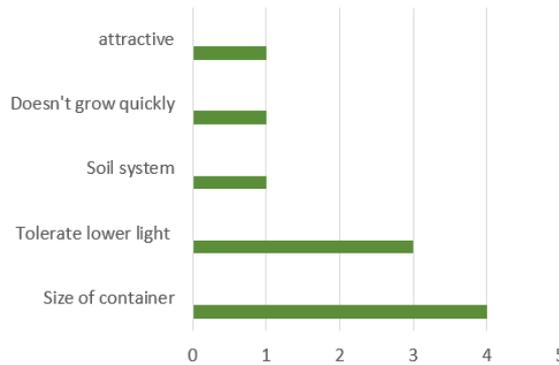
Question: How much people think indoor plants harmful to human health?



Question: How much people influence by indoor plants environment of an any working space?



Question: Peoples opinion, before having a plant on any space what are the most important elements in their mind?



IV. Observation and Discussion

Data shows that office workers prefer having greenery in their workplaces. Natural green interiors not only purify the air but also reduce noise and stress. Indoor plants should be an essential part of interior design, as they brighten spaces and boost mood. While most people favor green design concepts, many lack the knowledge to maintain plants. Some practical tips include:

- Choose indoor plants that are easy to care for.
- Select plants that require low light and water.
- Opt for species that tolerate lower light and humidity.

- Pick plants less prone to pests.
- Prefer plants that do not grow excessively.

Probable solution

Adding 2 plants per 100 sq. ft. can improve air quality, boost employee well-being, and increase productivity by up to 15%. Office conditions like low light and temperature fluctuations can challenge plant growth, but with proper care, plants thrive. Integrating greenery into office design requires expertise in plants and interiors, as demonstrated in the Silken Sewing office project. The implementation of indoor plantation design in silken sewing office given here-

Ground Floor (Total Space- 360sft)



Fig.: Existing scenario of reception



Fig.: Proposed scenario of reception

Used plants-

- Parlor palm
- Orchid
- Pothos plants

Maintenance system-

- Use of raw manure(in bangla "kecho sar")
- Watering the plant once in a week.
- Keep the plant in the sunlight for once in a month.
- (ORCHID Need Only Water)



Fig.: Existing scenario of reception



Fig.: Proposed scenario of reception



Fig.: Existing scenario of reception



Fig.: Proposed scenario of reception



Fig.: Existing scenario of conference room



Fig.: Proposed scenario of conference room



Fig.: Existing scenario of Workstation.



Fig.: Proposed scenario of Workstation.



Fig.: Existing scenario of Workstation.



Fig.: Proposed scenario of Workstation.

V. Conclusion

Indoor plants are an effective, sustainable solution for improving indoor environmental quality and human well-being. By mitigating air pollution, enhancing psychological comfort, and increasing productivity, interior plantation addresses many challenges of modern indoor living. Scientific evidence confirms that plants provide tangible and intangible benefits that extend beyond decoration. Integrating indoor plants into interior design offers a low-cost, high-impact strategy for healthier offices and residences. With proper design, plant selection, and maintenance, interior plantation can transform enclosed spaces into productive, comfortable, and restorative environments.

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