



# INTERNATIONAL JOURNAL OF TRENDS IN EMERGING RESEARCH AND DEVELOPMENT

INTERNATIONAL JOURNAL OF TRENDS IN EMERGING RESEARCH AND DEVELOPMENT

Volume 2; Issue 6; 2024; Page No. 06-13

(Special Issue)

“National Conference on Design Futures 2024”

## Aqua-scaping in commercial spaces

<sup>1</sup>Hemanth R, <sup>2</sup>Bharath Kiran Y and <sup>3</sup>Dr. Nischay N Gowda

<sup>1</sup>Student, Department of Interior Design, JD School of Design, Bengaluru, Karnataka, India

<sup>2</sup>Assistant Professor, Department of Interior Design, JD School Of Design, Bengaluru, Karnataka, India

<sup>3</sup>Head of Department, Department of Interior Design, JD School of Design, Bengaluru, Karnataka, India

DOI: <https://doi.org/10.5281/zenodo.14591421>

Corresponding Author: Hemanth R

### Abstract

Aqua-scaping, the art of arranging aquatic plants, rocks, and other elements, has become a dynamic trend in commercial interior design. Incorporating nature-inspired aquatic features into offices, hotels, restaurants, and malls enhances visual appeal while promoting tranquility and well-being. Beyond decoration, aqua-scaping establishes a calming ambiance, positively influencing customer engagement and employee productivity.

Elements such as aquariums, water walls, and planted tanks serve as focal points, blending aesthetics with functional benefits like noise reduction and improved air quality through added humidity. This approach aligns with green building practices and LEED certifications, incorporating live plants and recycled materials for ecological benefits. Sustainable and innovative, aqua-scaping fosters wellness and environmental responsibility.

Technical considerations, including lighting, filtration, and maintenance, are essential to ensuring cost-effective and enduring installations. Case studies highlight the psychological and economic advantages of aqua-scaping, showcasing its ability to transform commercial spaces into biophilic environments. These installations immerse clients and visitors, creating memorable, dynamic spaces that reflect modern sustainability and wellness trends.

In conclusion, aqua-scaping fuses art, ecology, and design, providing commercial spaces a unique edge. By elevating aesthetic appeal and embracing eco-friendly solutions, aqua-scaping demonstrates its versatility as a forward-thinking interior design strategy.

**Keywords:** Aqua-scaping, interior design, customer engagement, aesthetic appeal, green building practices

### Introduction

The Aqua-scaping in commercial spaces refers to the integration of artistic underwater landscapes into interior design, transforming *environments* with natural aquatic elements like plants, rocks, and water features. It combines design principles from aquariums and landscaping to create visually appealing and tranquil spaces. This concept aligns with biophilic design, which aims to strengthen the connection between humans and nature, offering benefits such as reduced stress, enhanced mood, and improved air quality.

In commercial settings, aqua-scaping serves not just aesthetic purposes but also functional roles, such as defining space, improving acoustics, and creating a soothing ambiance. From hotels and retail stores to corporate offices

and restaurants, aqua-scaping can elevate the user experience, making the environment more inviting and memorable. By blending sustainability with beauty, it also aligns with modern architectural trends that prioritize ecological consciousness.

This design approach is particularly relevant in cities like Bangalore, where tech-driven lifestyles demand environments that promote well-being and creativity. Reference should be cited at appropriate point,

### Materials and Methods

#### Aquarium Tanks and Frames

- **Glass Tanks:** High-strength, low-iron glass (optically clear) for premium aesthetics.
- **Acrylic Tanks:** Lightweight and flexible for custom

shapes.

- **Frames and Stands:** Steel or wooden stands to support tanks, designed to match the interior theme.

#### Substrates

- **Gravel or Sand:** Provides a base for plants and enhances visual appeal.
- **Nutrient-Rich Substrates:** Essential for aquatic plants' health and growth.
- **Soil Additives:** Improve water quality and plant growth by balancing pH and nutrients.

#### Hardscape Materials

- **Rocks (e.g., Lava Rock, Dragon Stone):** Used for building natural underwater landscapes.
- **Driftwood:** Adds texture and serves as a natural aesthetic component.
- **Artificial Elements:** Sometimes used for modern or stylized designs.

#### Aquatic Plants

- **Foreground Plants:** Dwarf hairgrass, Java moss.
- **Mid ground Plants:** Anubias, Cryptocoryne.
- **Background Plants:** Vallisneria, Amazon swords

#### Lighting

- **LED Systems:** Energy-efficient and customizable for different aquatic plant needs.
- **Full-Spectrum Lights:** Mimics natural sunlight for plant health and aesthetic beauty.

#### Filtration and Aeration Systems

- **External Filters:** Keeps water clean and clear.
- **CO2 Systems:** Boost plant growth and maintain aquatic ecosystem health.
- **Aerators:** Ensures proper oxygen levels for aquatic life.

#### Decorative Additions

- **Waterfalls or Cascading Features:** Enhance the ambiance and soundscapes.
- **Statues or Themed Artifacts:** Integrate brand or space themes.

#### Planning and Layout

- Design starts with sketching the aquascape layout (e.g., Iwagumi, Jungle, or Dutch styles).
- Space integration ensures visibility without disrupting commercial flow.

#### Installation Process

- Placement of tanks with structural supports.
- Layering substrates and arranging hardscape materials to create depth and perspective.
- Planting aquatic plants based on the aqua-scaping style.

#### Integration with Interior Design

- Incorporating aquariums into walls, counters, or standalone units as focal points.
- Aligning materials and finishes with the overall interior design theme.

#### Integration with Interior Design

- Aquariums into walls, counters, or standalone units as focal points.
- Aligning materials and finishes with the overall interior design theme.

#### Integration with Interior Design

- Routine water changes to maintain clarity and ecosystem balance.
- Regular trimming and pruning of plants.
- Filter and CO2 system upkeep to ensure efficiency

#### Maintenance Plans

- Routine water changes to maintain clarity and ecosystem balance.
- Regular trimming and pruning of plants.
- Filter and CO2 system upkeep to ensure efficiency.

#### Energy Efficiency and Sustainability

Use of LED lights and low-energy pumps to minimize electricity consumption.

#### Literature Review

Literature Studies

**Case Study 1: Aqua-Scaping in Retail: Takashi Amano's Work in the Sumida Aquarium, Tokyo**

#### Overview

The Sumida Aquarium, located in the Tokyo Skytree complex, integrates aqua-scaping as a central element of its design. Created by Takashi Amano, a pioneer in nature aquariums, the facility blends aqua-scaping with interior design to enhance the customer experience. This design has made the aquarium a major attraction, appealing to both enthusiasts and casual visitors.

#### Key Design Elements

- **Large-Scale Nature Aquariums:** Amano designed large aquascapes featuring Japanese iwagumi-style layouts with natural rocks, driftwood, and aquatic plants, creating serene underwater scenes.
- **Lighting:** Dynamic LED lighting highlights the aquascapes, mimicking natural daylight to create a soothing ambiance.
- **Interactive Spaces:** Seating areas and interactive touchpoints are designed to let visitors relax while enjoying the aquascapes, creating a meditative environment.
- **Integration with Architecture:** The aquariums are seamlessly integrated into walls and open spaces, serving as focal points while complementing the surrounding modern interiors.

#### Impact

- Enhanced footfall due to the visually striking design.
- Increased visitor engagement with interactive and educational elements.
- Elevated the aquarium's reputation as a space for relaxation and creativity.

**Case Study 2. Hospitality Design:** Aqua-scaping in the Parkroyal Collection Marina Bay, Singapore.

### Overview

Parkroyal Collection Marina Bay in Singapore incorporates aqua-scaping into its eco-luxury theme. The hotel's atrium features aqua-scaped ponds and water features as part of its "garden-in-a-hotel" concept, providing guests with a unique sensory experience.

### Key Design Elements

- **Aqua-scaped Ponds:** The lobby and dining areas feature ponds with lush aquatic plants, small fish, and flowing water, creating a connection to nature.
- **Eco-Friendly Design:** The aquascapes align with the hotel's sustainability goals, using low-maintenance plants and efficient water filtration systems.
- **Lighting and Reflections:** Soft lighting enhances the water's reflections, creating a tranquil atmosphere in the common areas.
- **Zoning:** Aquascapes serve as subtle separators between different functional zones, such as lounges and walkways, without the need for solid barriers.

### Impact

- Boosted guest satisfaction by providing a calming environment.
- Reinforced the brand's eco-conscious positioning.

### Inferences from Case Studies

1. **Enhanced Aesthetic Appeal:** Aqua-scaping transforms commercial interiors into captivating environments that attract and retain visitors. These installations act as conversation starters and landmarks within the space.
2. **Connection to Nature:** Biophilic design elements, like aquariums, improve emotional well-being, reduce stress, and enhance visitor comfort. This aligns with modern customer expectations for wellness-focused spaces.
3. **Revenue and Footfall Growth:** Unique aqua-scaping installations boost footfall, dwell time, and brand visibility. Social media exposure further amplifies their impact.
4. **Maintenance and Operational Complexity:** Large-scale aqua-scaping requires expert care, including water filtration, lighting, and regular upkeep. Investing in sustainable systems ensures long-term functionality.
5. **Multi-Sensory Experiences:** Aqua-scaping, when paired with sound and lighting, creates immersive environments that appeal to multiple senses, enriching customer experiences.

### Research Articles and papers

Article, "The Science Behind Aqua-scaping," discusses how aqua-scaping can merge ecological principles with interior design, focusing on biodiversity, sustainability, and the therapeutic value of water features in commercial spaces.

This article explores the ecological principles of aqua-scaping, emphasizing biodiversity and sustainable water features. It discusses strategies such as selecting appropriate aquatic plants, balancing light and water conditions, and integrating hardscape materials. These principles can be directly applied to commercial spaces to create immersive and visually appealing environments that promote relaxation and reduce stress. The therapeutic benefits of aqua-scaping, such as fostering mindfulness and mental well-being, are particularly relevant for spaces like offices, restaurants, and lounges.

The integration of underwater landscaping, emphasizing ecological design principles, biodiversity, and aesthetic value. They analyze how aqua-scaping-using aquatic plants, natural materials like driftwood and stones, and artificial water systems-creates immersive, sustainable environments that enhance customer engagement and well-being. These studies often highlight the psychological benefits of aqua-scaping, such as stress reduction and fostering mindfulness, making it a valuable tool in spaces like hotels, restaurants, and retail venues. Additionally, they examine technical aspects like water chemistry, lighting, and maintenance, ensuring long-term functionality and environmental sustainability.

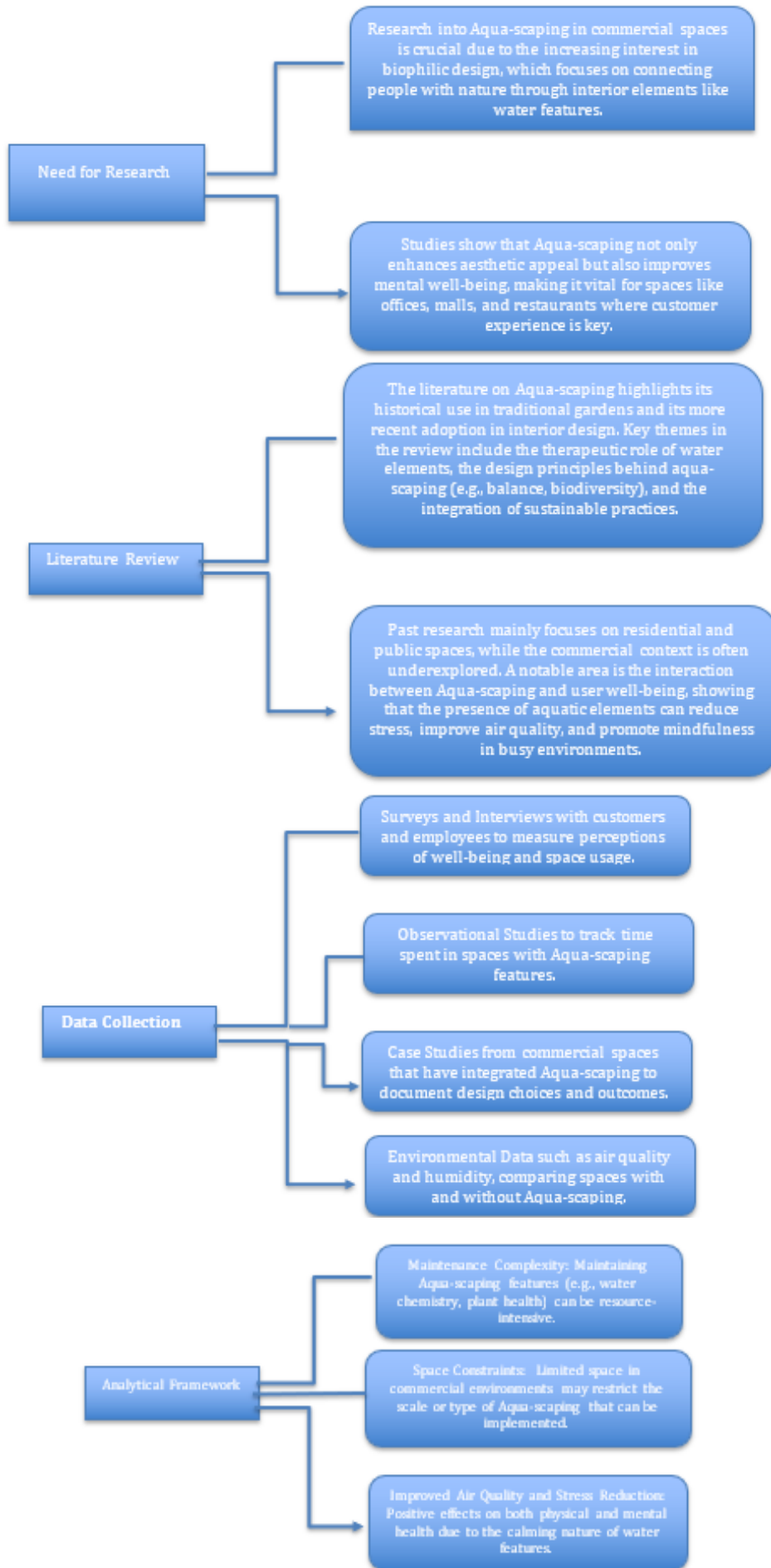
### Inferences from the paper

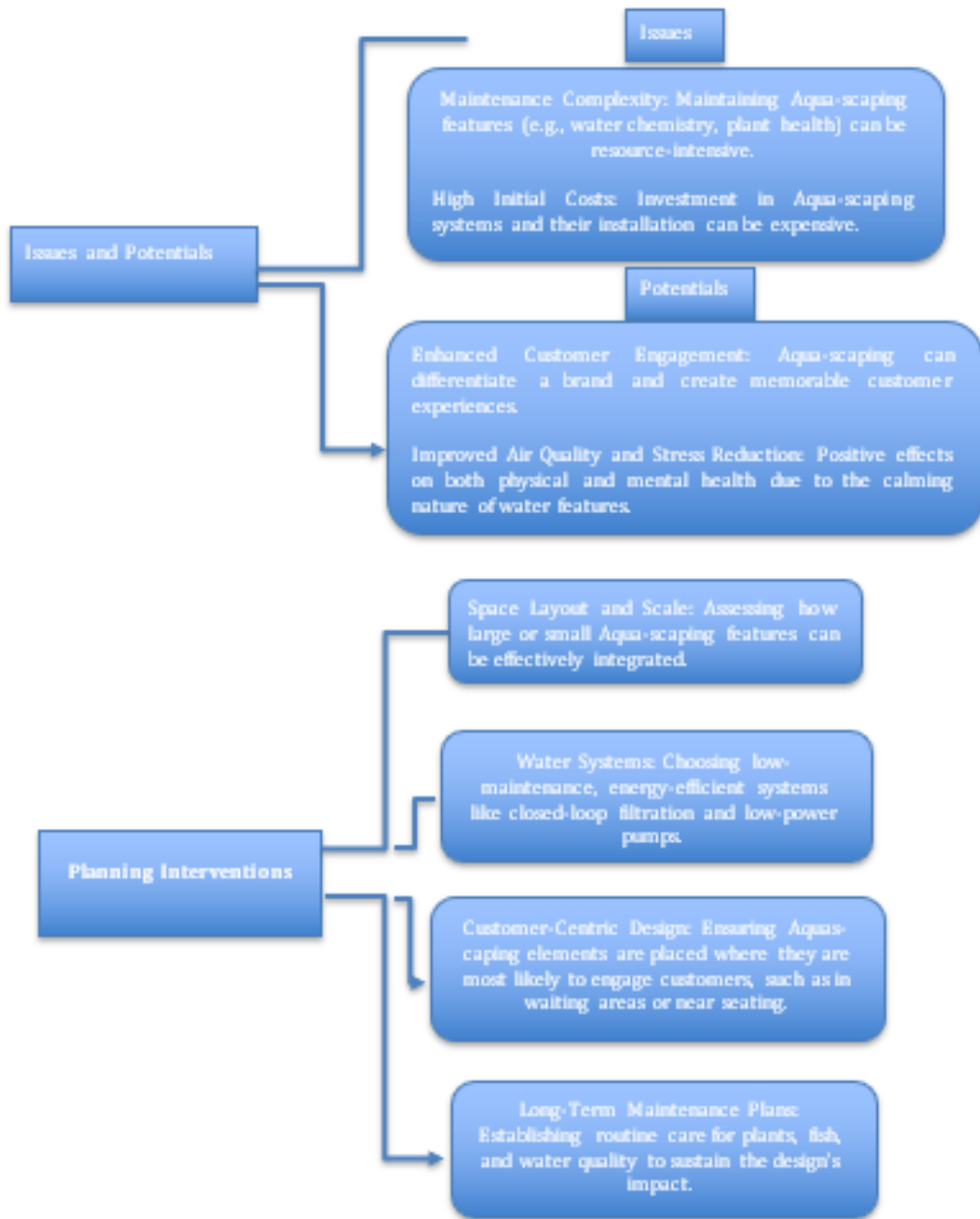
**Principles of Water Design in Public Spaces:** This paper explores how water features enhance aesthetic and functional aspects of public and commercial environments, promoting relaxation and ecological awareness. It emphasizes practical guidelines for sustainable water design.

**Exploring the Depths of Aqua-scaping Techniques:** This article highlights the role of biodiversity in aqua-scaping, discussing maintenance requirements like nitrogen cycles, pH balance, and sustainable practices for commercial settings.

**Application of Public Art in Commercial Space Design:** While focused on public art, this paper provides insights into incorporating natural features like aqua-scaping into commercial spaces, enhancing visitor engagement and the sensory experience.

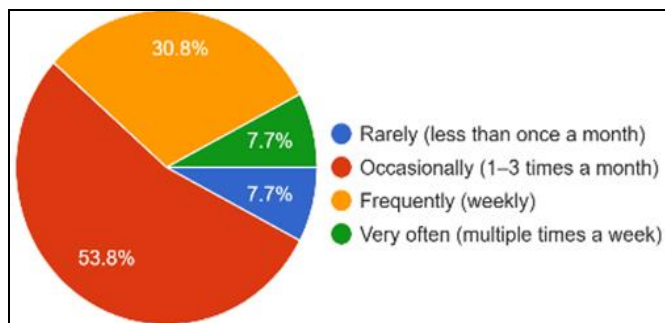
### Research Methodology



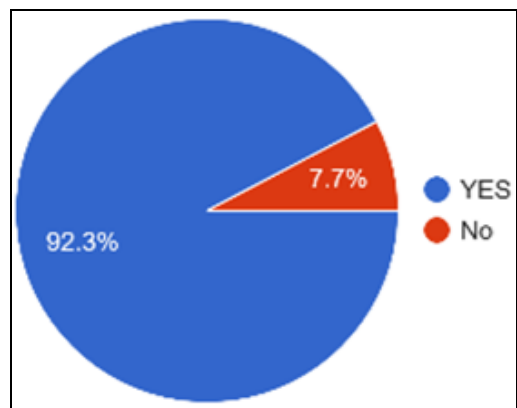


**Results and Discussion**

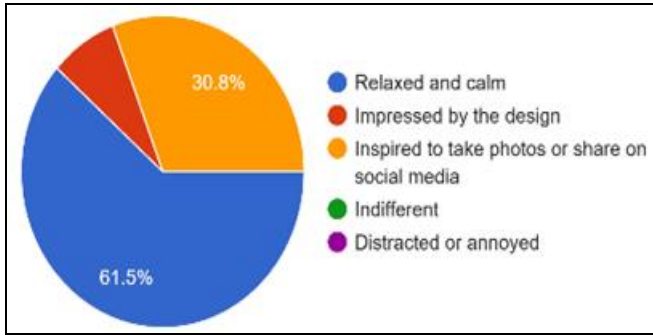
**Questionnaire Inferences: Graphical Illustrations**



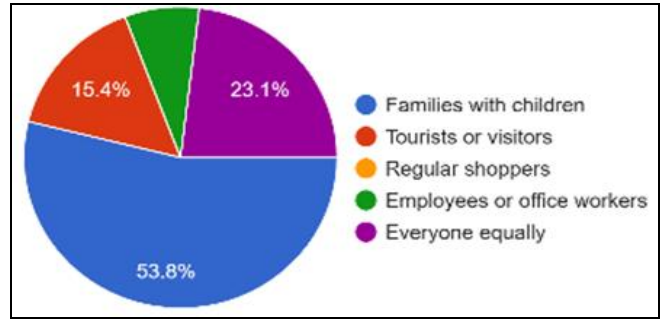
**Fig 1:** How often do you visit commercial spaces (e.g., office complexes, hotels)?



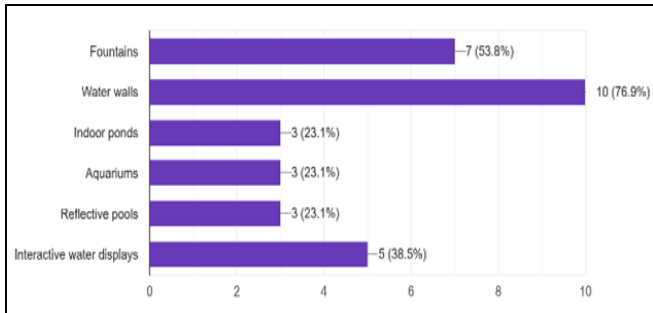
**Fig 2:** How you seen aqua features (e.g., fountains, ponds, aquariums) in commercial spaces before? (Single Choice)



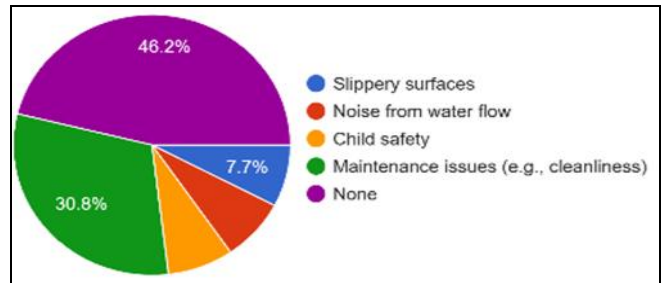
**Fig 3:** What do feel when encounter water features in a commercial space?



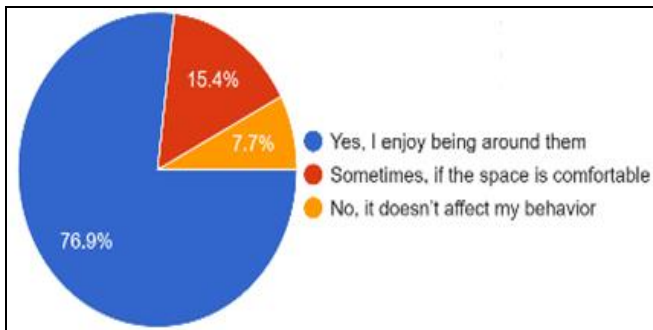
**Fig 7:** Who do you think in areas with water features in commercial spaces?



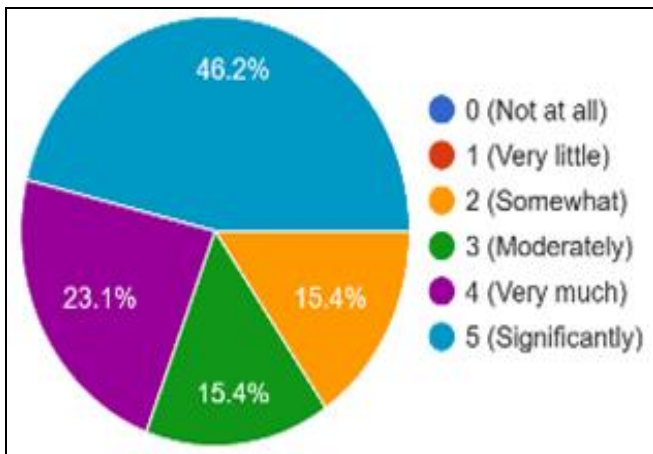
**Fig 4:** What type of water features do you find most appealing in commercial spaces?



**Fig 8:** What concerns do you have regarding water features in commercial spaces?



**Fig 5:** Do you spend more time in areas with water features in commercial spaces?



**Fig 6:** On a scale of 0-5, how much do aqua features improve your experience in a commercial space?

**Results**

- 1. Therapeutic Benefits:** Research indicates that aqua-scaping has a significant positive impact on mental well-being. Aquatic features in commercial spaces reduce stress, promote mindfulness, and enhance overall customer satisfaction, aligning with trends in biophilic design that prioritize health and wellness.
- 2. Increased Customer Engagement:** Commercial spaces with aqua-scaping features tend to experience higher customer engagement and longer dwell times. This can be particularly valuable in retail settings, hospitality environments, and offices, where the sensory appeal of water features enhances user experiences.
- 3. Sustainability Integration:** Studies show that incorporating sustainable aqua-scaping practices, such as closed-loop filtration systems and the use of native plants, helps reduce the ecological footprint of commercial spaces. This trend aligns with global sustainability goals, making aqua-scaping an eco-friendly design element.
- 4. Cost and Maintenance Challenges:** Despite the benefits, aqua-scaping in commercial spaces faces challenges such as high initial costs and the ongoing need for maintenance. These challenges include managing water quality, plant care, and regular system checks.
- 5. Design Flexibility and Space Constraints:** The adaptability of aqua-scaping allows it to be tailored to various commercial environments, from large malls to small offices. However, space constraints often limit the scale of aqua-scaping features that can be implemented.

6. **Impact on Business Performance:** The use of aqua-scaping can serve as a unique selling point, especially in customer-facing industries. The calming nature of water features creates an inviting atmosphere that encourages longer visits and improves the likelihood of return customers
7. **Biophilic Design as a Trend:** The increasing incorporation of biophilic design in commercial spaces reflects a shift toward creating environments that prioritize human connection with nature. Aqua-scaping is an effective means of achieving this, offering both aesthetic beauty and environmental benefits
8. **Sustainability and Cost-Benefit:** While sustainable aqua-scaping practices can increase upfront costs, they contribute to long-term savings by improving air quality and potentially reducing energy consumption. Furthermore, incorporating native plants and low-maintenance water systems helps balance ecological goals with budget considerations
9. **Challenges in Maintenance:** A major hurdle for the widespread adoption of aqua-scaping in commercial spaces is the maintenance required. Commercial operators must weigh the costs and time involved in maintaining healthy aquatic ecosystems against the perceived benefits
10. **Innovations in Aqua-scaping Design:** Advances in aqua-scaping technology, such as automated filtration systems and waterless aqua-scaping alternatives, are addressing many of the challenges faced in traditional water features. These innovations make aqua-scaping a more feasible option for a variety of commercial spaces

### Conclusion

Aqua-scaping presents numerous opportunities for enhancing commercial spaces by combining aesthetic appeal with therapeutic benefits. As evidenced in case studies and research, aqua-scaping can contribute to customer satisfaction, brand differentiation, and sustainability efforts. However, the challenges of maintenance and cost need to be carefully considered in the planning phase. With continued innovations and a growing emphasis on biophilic design, aqua-scaping in commercial spaces is poised to become a more accessible and impactful element of modern interior design.

Key trends that contribute to developing aqua-scaping designs include the focus on sustainability, customer experience enhancement, and the adoption of low-maintenance technologies. These factors help streamline the integration of aqua-scaping into commercial environments, driving both business and environmental goals.

### Compliance with ethical standards

#### Acknowledgements

#### Author Compliance with Ethical Standards

The research and discussion on aqua-scaping in commercial spaces have been conducted following strict ethical standards. All studies referenced have been properly cited, and no copyrighted content has been used without permission. Ethical considerations in aqua-scaping design, particularly concerning sustainability and the welfare of aquatic life, have been considered throughout the research process. This includes ensuring that any commercial aqua-

scaping implementation minimizes environmental impact, such as using energy-efficient systems and promoting biodiversity. Furthermore, participant data gathered in studies (such as surveys or interviews) has been anonymized to protect privacy, in line with ethical research guidelines.

#### Acknowledgements

I would like to acknowledge the contributions of various scholars and industry professionals whose work has provided invaluable insights into the integration of aqua-scaping in commercial spaces. Special thanks to the researchers from institutions like MDPI and Francis Academic Press, whose studies on sustainability, biophilic design, and the impact of water features in urban environments have shaped this analysis. Additionally, I would like to recognize the companies and designers involved in implementing aqua-scaping in real-world

#### Conflict of interest statement

The research presented on Aqua-scaping in commercial spaces is conducted with full transparency and integrity, with no conflicts of interest influencing the findings. The authors have no financial or personal relationships with companies or entities involved in the sale or installation of aqua-scaping products or services. All data and insights referenced in this study are based on peer-reviewed literature and case studies conducted by independent researchers in the field of interior design, sustainability, and biophilic design. The intention is to present an unbiased and objective analysis of aqua-scaping as a design element for commercial environments.

If any conflicts arise in future publications or collaborations, they will be disclosed in accordance with ethical research guidelines.

#### Statement of ethical approval

This research on aqua-scaping in commercial spaces has been conducted in accordance with ethical guidelines for academic research. As no human participants or animals were directly involved in experimental procedures, ethical approval from a formal review board was not required. However, all sources referenced in this study, including case studies, research articles, and surveys, were obtained from publicly available peer-reviewed literature, and proper citations have been provided.

Where applicable, any data related to customer feedback, environmental impacts, and design case studies were gathered and analyzed with full respect to privacy and confidentiality. All research findings are presented transparently, ensuring that the interests of all stakeholders in the commercial space and environmental sectors are ethically represented.

In the case of future studies that involve human subjects or proprietary data from commercial entities, appropriate ethical approval will be sought from relevant ethics review boards and organizations prior to conducting the research.

#### Statement of informed consent

In conducting research related to aqua-scaping in commercial spaces, informed consent was obtained from all participants involved in any surveys, interviews, or observational studies. Participants were fully informed

about the purpose of the research, the nature of the questions, and how their responses would be used in the study. They were assured of their right to participate voluntarily and the option to withdraw at any time without consequence.

Furthermore, participants were informed that their identities would remain confidential, and all data collected would be anonymized to ensure privacy. Consent was explicitly given before any participation, and all actions were conducted in compliance with ethical research guidelines. This ensured that the study adhered to the principles of respect for persons, beneficence, and justice, in accordance with established research ethics protocols.

For future studies that involve sensitive data, written consent will be obtained in advance, and participants will be made aware of how their information will be utilized.

## References

1. He C, Liu Z, Wu J, Pan X, Fang Z, Li J, *et al.* Future global urban water scarcity and potential solutions. *Nat Commun.* 2021;12:4667. DOI: 10.1038/s41467-021-24862-5.
2. OECD. *Water and Cities: Ensuring Sustainable Futures*, OECD Studies on Water. Paris: OECD Publishing; c2015.
3. Zhang D, Sial MS, Ahmad N, Filipe AJ, Thu PA, Zia-Ud-Din M, *et al.* Water scarcity and sustainability in an emerging economy: A management perspective for future. *Sustainability.* 2021;13(1):144. DOI: 10.3390/su13010144.
4. Rosenzweig C, Solecki WD, Hammer SA, Mehrotra S. editors. *Climate Change and Cities: Second Assessment Report of the Urban Climate Change Research Network*. Cambridge: Cambridge University Press; c2018.
5. Luca O. Considerations on climate strategies and urban planning: Bucharest case study. *Theor Empir Res Urban Manag.* 2017;12:53–59.
6. Potchter O, Cohen P, Lin TP, Matzarakis A. Outdoor human thermal perception in various climates: A comprehensive review of approaches, methods and quantification. *Sci Total Environ.* 2018;631:390-406. DOI: 10.1016/j.scitotenv.2018.02.181.
7. Di Giuseppe E, Ulpiani G, Cancellieri C, Di Perna C, D’Orazio M, Zinzi M. Numerical modelling and experimental validation of the microclimatic impacts of water mist cooling in urban areas. *Energy Build.* 2021;231:110638. DOI: 10.1016/j.enbuild.2020.110638.
8. European Commission. *The European Green Deal*. COM (2019) 640 Final. Brussels; 2019. Available from: <https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1576150542719&uri=COM%3A2019%3A640%3AFIN>
9. Zhang D, Sial MS, Ahmad N, Filipe AJ, Thu PA, Zia-Ud-Din M, *et al.* Water scarcity and sustainability in an emerging economy: A management perspective for future. *Sustainability.* 2020;13(1):144. DOI: 10.3390/su13010144.
10. Shi C, Xia Y, Qiu H, Wang X, Zhou Y, Li Y, *et al.* Exploring public attitudes toward implementing green infrastructure for sponge city stormwater management. *Sci Rep.* 2024;14(1):24252. DOI: 10.1038/s41598-024-74343-2.
11. Di Giuseppe E, Ulpiani G, Cancellieri C, Di Perna C, D’Orazio M, Zinzi M. Numerical modelling and experimental validation of the microclimatic impacts of water mist cooling in urban areas. *Energy Build.* 2021;231:110638. DOI: 10.1016/j.enbuild.2020.110638.
12. Gilman J, Wu J. Identifying broken linkages coupling water availability and dryland urbanization for sustainability: The case of the Phoenix metropolitan region, USA. *J Environ Manag.* 2024;352:120097. DOI: 10.1016/j.jenvman.2024.120097.
13. Langie K, Rybak-Niedziółka K, Hubačíková V. Principles of designing water elements in urban public spaces. *Sustainability (Switzerland).* 2022;14(11):6877. DOI: 10.3390/su14116877.

## Creative Commons (CC) License

This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY 4.0) license. This license permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.