

Biodiversity Oasis in the Urban Jungle

(Photo Credit: Willy Legrand)

FROM BOH TO FOH THE VALUE OF BIOPHILIC DESIGN IN THE HOTEL SECTOR

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TODAY

1

UNDERSTANDING



**SETTING THE STAGE:
RISKS**

2

APPLYING



**BIOPHILIA &
BIOPHILIC DESIGN:
THEORY & PRACTICE**

3

REFLECTING



DEEP ECOLOGICAL ZONES

SETTING THE STAGE

“It is clear that we cannot solve [the global biodiversity and climate crises] in isolation – we either solve both or we solve neither”

—Sveinung Rotevatn, Norway’s climate and environment minister

TRANSITION RISKS

Environmental Risks: Critical Long-Term Threats (WEF, 2022)

1. Climate action failure

2. Extreme weather

3. Biodiversity Loss

7. Human environmental damage

8. Natural resource crisis

WEF (2022). The Global Risks Report 2022, 17th Edition. World Economic Forum. <https://www.weforum.org/reports/global-risks-report-2022>

DECLARATIONS, PLEDGES, COMMITMENTS & METHODOLOGIES

Glasgow Declaration of Climate Action in Tourism

To cut emissions by 50 percent by 2030 and to reach net zero by 2050.

Net Zero Roadmap for Travel and Tourism

WTTC, UNEP

Assess & define, build & enable, reduce & collaborate, monitor & report

Pathway to Net Positive Hospitality

Sustainable Hospitality Alliance & Partners

Net Zero The Guide for the Brewing and Hospitality Sector

Zero Carbon Forum & members (e.g. KFC, IHG, Pizza Hut etc.)

The Net Zero Asset Managers initiative

Net zero greenhouse gas emissions by 2050 or sooner

Net Zero Methodology for Hotels

Greenview, PATA, Sustainable Hospitality Alliance WTTC and others (December 2021)

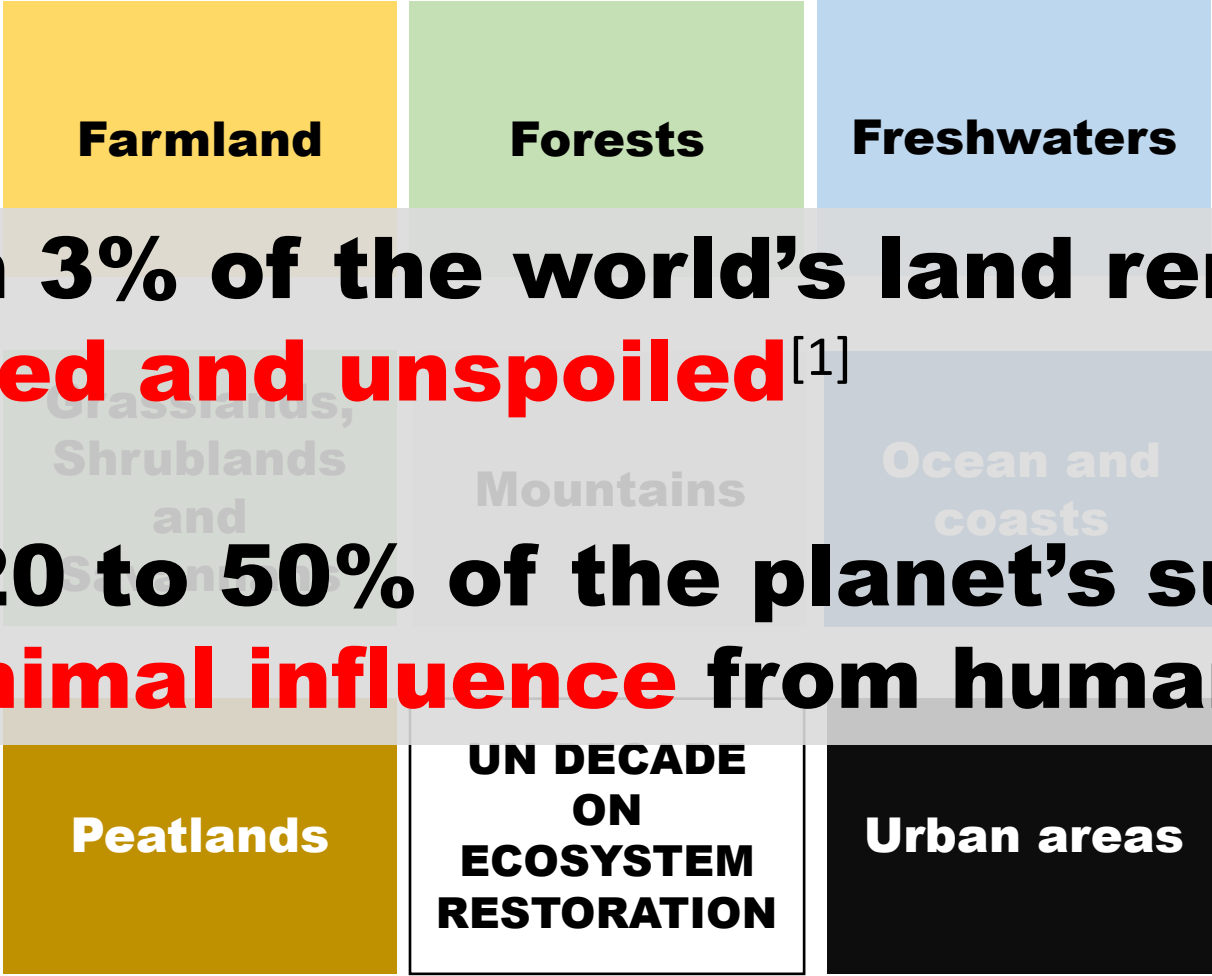
Step by step guidance towards full decarbonization, with responsibility split across the hotel value chain and timeline of actions

MSCI Climate VaR methodology: Real estate

Climate Value-at-Risk (Climate VaR) on a return-based valuation assessment to measure climate related risks and investment opportunities

UN DECADE ON ECOSYSTEM RESTORATION

Restoring Hospitality – Restoring Ecosystems



Less than 3% of the world's land remains undisturbed and unspoiled^[1]

Another 20 to 50% of the planet's surface is under minimal influence from human's footprint^[2]

[1] Plumptre, A.J., Baisero, D., Belote, R.T., et al. (2021). Where Might We Find Ecologically Intact Communities? *Frontiers in Forests and Global Change*, 15 April. <https://doi.org/10.3389/ffgc.2021.626635>
[2] Riggio, J., Baillie, J.E.M., Brumby, E.E., et al. (2020). Global human influence maps reveal clear opportunities in conserving Earth's remaining intact terrestrial ecosystems. *Global Change Biology*. 05 June. <https://doi.org/10.1111/gcb.15109>

BIOPHILIA & BIOPHILIC DESIGN

**“I go to nature every day for inspiration in the day’s work.
I follow in building the principles which nature has used in its domain.”**

—Frank Lloyd Wright

BIOPHILIA

“...innate tendency to focus on life and lifelike processes.”

The Biophilia Hypothesis (Wilson, 1984, p.1)

“much of the human search for a coherent and fulfilling existence is intimately dependent upon our relationship to nature”

Biophilia Values

(Kellert, 1993, p.43)

Wilson, E. O. (1984). *Biophilia*. Cambridge, London, Massachusetts, United States of America, England: Harvard University Press.

Kellert, S. R. (1993). *The Biological Basis for Human Values of Nature*. In S. R. Kellert, & E. O. Wilson, *The Biophilia Hypothesis*. Washington, D.C: Island Press.

BIOPHILIC DESIGN

ECO HOSPITALITY

THEORETICAL BASIS OF **BIOPHILIC DESIGN**

Habitat & Dwelling

Prospect-Refuge Theory (Appleton, 1975)

The Savanna Hypothesis (Orians and Heerwagen, 1992)

Restoration

Stress Recovery Theory (Ulrich, 1983; Ulrich et al., 1991)

Attention Restoration Theory
(Kaplan, 1995; Kaplan and Kaplan, 1989)

Place

Place Attachment Theory (Hidalgo and Hernandez, 2001; Manzo, 2003)

Source: Zhong, W., Schröder, T., & Bekkering, J. (2021). Biophilic design in architecture and its contributions to health, well-being, and sustainability: A critical review. *Frontiers of Architectural Research*, <https://doi.org/10.1016/j.foar.2021.07.006>

THEORETICAL BASIS OF BIOPHILIC DESIGN

Habitat & Dwelling

Prospect-Refuge Theory (Appleton, 1975)

The Savanna Hypothesis (Orians and Heerwagen, 1992)

“creating good habitat for people as biological organisms in the modern built environment that enhances people’s physical and mental health, fitness and wellbeing” (Kellert, 2016, p. 2).

Place

Place Attachment Theory (Hidalgo and Hernandez, 2001; Manzo, 2003)

(Kaplan, 1995; Kaplan and Kaplan, 1989)

Source: Zhong, W., Schröder, T., & Bekkering, J. (2021). Biophilic design in architecture and its contributions to health, well-being, and sustainability: A critical review. *Frontiers of Architectural Research*, <https://doi.org/10.1016/j.foar.2021.07.006>

Source: Kellert, S. R. (2016). Biophilic urbanism: the potential to transform. *Smart and Sustainable Built Environment*, 5(1), 1-7.

BIOPHILIC INTERIOR DESIGN MATRIX [1,2]

Over 50 attributes in six major biophilic interior design elements

Natural features

Natural shapes and forms

Natural patterns and processes

Colour and light

Place based relationships

Human nature relationships

Sources:

[1] Andreucci, M.B., Loder, A., McGee, B., Brajković, J., Brown, M. (2021). Exploring Regenerative Co-benefits of Biophilic Design for People and the Environment. In: Catalano, C., Andreucci, M.B., Guarino, R., Bretzel, F., Leone, M., Pasta, S. (eds) Urban Services to Ecosystems . Future City, vol 17. Springer, Cham. https://doi.org/10.1007/978-3-030-75929-2_21

[2] McGee B, Park N-K, Portillo M, Bosch S, Swisher ME (2019) DIY biophilia: development of the biophilic interior design matrix as a design tool. J Inter Des 44(4):241–247

BIOPHILIA & NATURE-BASED SOLUTIONS

Boutiquehotel Stadthalle, Vienna

THE BUILT-ENVIRONMENT

Urban areas

Urban settings are **ecosystems** essential to **quality of life** and **well-being** providing space for **social** and **cultural experiences**.

- building materials** → Raw/processed material needs such as concrete, glass, aluminum...
- building systems** → Soil sealing, heat storage, green spaces, water-, energy- and nutrient cycles...
- building sites** → Urban heat island effect, air cooling needs, habitat impacts...

Source: Pearlmutter, D., Theochari, D., Nels, T., Pinho, N., Piro, P., Korolova, A., Papaefthimiou, S., ... Pucher, B. (2019). Enhancing the circular economy with nature-based solutions in the built urban environment: green building materials, systems and sites. *Blue-Green Systems*, 2(1). 190-216. <https://doi.org/10.2166/bgs.2019.928>

NATURE BASED SOLUTIONS (NbS)

NbS are activities or actions that are specifically designed to protect and restore natural or modified habitat resulting in shared benefits

Source: Cohen-Shacham et al., 2016; Seddon et al., 2020

reducing urban heat island effect (Feitosa and Wilkinson, 2018)

improving air quality, absorbing pollutants (Charoenkit and Yiemwattana, 2017)

improving water management (Prodanovic et al., 2017)

reducing noise pollution (Jang et al., 2015)

increasing thermal comfort (Charoenkit and Yiemwattana, 2016)

reduce the temperature of walls up to 20 Celsius in the summer (Mazzali et al., 2013)

benefits of NbS outweighing the cost of implementation
(Seddon et al. 2020; Winch et al., 2020))

GREEN ROOF CASE

Green Roof at Trivago's HQ in Düsseldorf, LEED ID+C Gold
(Photo Credit: <https://earth.google.com/>)

30% of Roof Space + 60% Cool Roofs by 2050
37 billion m² of efficient roofing globally (Project Drawdown, 2017)

Carbon dioxide reduction of 0.8 gigatons at a cost of US\$ 1.4 trillion.
Thirty-year savings of US\$988
Lifetime savings of US\$3 trillion (Project Drawdown, 2017)

URBAN TREES

Cooling Towers in the Urban Jungle

(Photo Credit: <https://earth.google.com/>)








New York
Hallett Nature Sanctuary
New York, NY, USA
with trails & a pond
40.71°N, 74.01°W

The Pond at Central Park

reducing urban heat island effect (Feitosa and Wilkinson, 2018)

The role of urban trees in reducing land surface temperatures in European cities

Jonas Schwaab ¹✉, Ronny Meier ¹, Gianluca Mussetti ¹, Sonia Seneviratne ¹, Christine Bürgi¹ & Edouard L. Davin ^{1,2}



Treeless urban green spaces are overall less effective in reducing LSTs
Their cooling effect is approximately **2-4 times lower** than the cooling induced by urban trees.

INDIVIDUAL AND COMMUNITY BENEFITS

Healthier communities inside and outside the building (Winch et al., 2020)

Green façades are found to positively affect physiological and psychological well-being (Elsadek, Liu & Lian, 2019)

use of nature elements in a hotel minimizes employees' burnout (Nieuwenhuis et al., 2014; Jongsik, 2020)

increase in employees' productivity and employee retention (Nieuwenhuis et al., 2014, Winch et al., 2020)

So what does this mean?

Urban Settings, Ecosystem Services & Deep Ecological Zones

HOTEL BACK OF HOUSE

ADVANCES IN
HOSPITALITY
AND LEISURE

Hindley, C., Legrand, W., & Zaslavskaya, A. (2022). **Biophilic design in the hospitality industry: A window into the back of house workspaces.** *Advances in Hospitality and Leisure*, 18.

“wherever I work, in whatever office, in whatever department, employees are always faced with the problem of insufficient light (...) They are often cluttered, and you do not have opportunities to ‘breathe deeply’.” (Interviewee 2, 2021)

“Most of the hotel management does not really care about the back of the house. For them, the most important thing is how Front-of-the-House looks like, the hotel itself, and they are not interested in the comfort of employees working in the office. the maximum space is given for the needs of guests. (...) This means that those square metres should be profitable.” (Interviewee 5, 2021)

HOTEL BACK OF HOUSE

“natural elements will be amazing to have, like plants, maybe even a living wall.” (Interviewee 4, 2021)

“lighter tones of colors of the walls, no loud noise, and a room full of natural light. Also, having live plants is really soothing; in the room, you feel life.” (Interviewee 4, 2021)

“it seems to me that they are still not quite ready to understand that a working design such as biophilic design contributes to development and business itself. (...) sooner or later we will come to this, because now people have slightly different values, so I want to believe that the employer will move in this direction. But what I see now, even new hotels being built, nothing new has been implemented there. They make it ‘old school’.” (Interviewee 2, 2021)

DEEP ECOLOGICAL ZONES

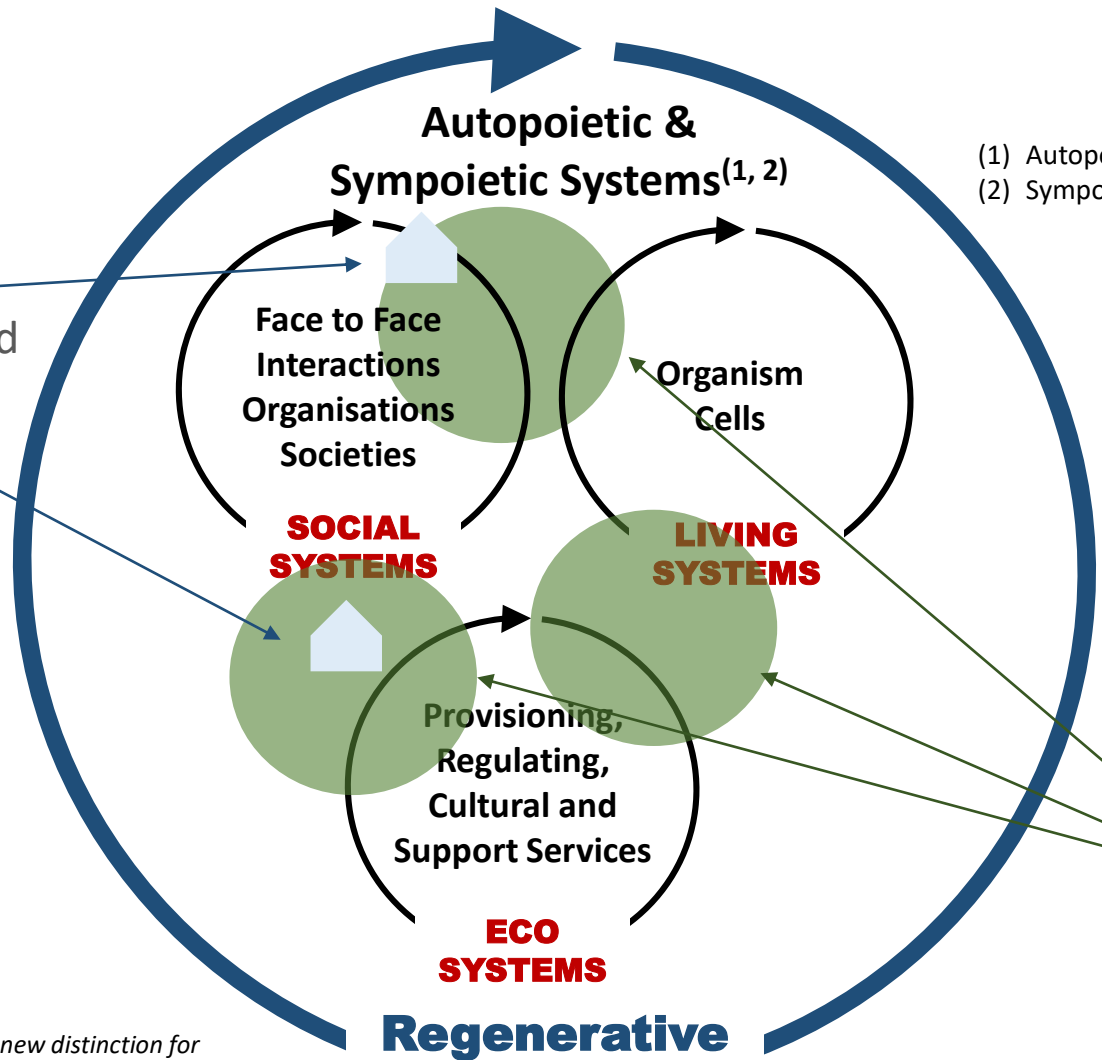
“we see connection between the need to restore hospitality in meaning and practice within ecosystem restoration.”

—Legrand, Van Rheede & Schønrock Nielsen, 2021

DEEP ECOLOGICAL ZONES & REGENERATION

Hospitality Spaces

Hotels & Restaurants providing safe spaces for people to meet and develop meaningful connections



- (1) Autopoiesis refers to the self-producing nature of living systems
- (2) Sympoiesis refers to collective creation or organisation

Deep Ecological Zones

Putting nature at the center of experiences and this at the center of business decisions

Regenerative Community & Codividuality

Source:
Dempster, B (1998). *Sympoietic and Autopoietic Systems : A new distinction for self-organizing systems*. Waterloo: School of Planning, University of Waterloo.
Maturana, H.R., Varela, F.G., and Uribe, R. (1974). Autopoiesis: The Organization Of Living Systems, Its Characterization And A Model. *Biosystems*, 5(4), 187–196.
Haraway, D. (2016). *Staying with the Trouble: Making Kin in the Chthulucene*. Durham: Duke University Press, 30–57.

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