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### *3.2 Songjiang Hotel*

The Songjiang Hotel in China was designed by the British firm Atkins Group, as depicted in Figure. The 380-room resort hotel is built in a 100-meter-deep quarry. The hotel's architecture was influenced by natural water and the quarry environment, which had a flowing green slope down a natural rock face. It has several sustainable advantages because it is located in a quarry. The usage of natural geothermal energy for its electricity supply and hot water supply from the quarry is the hotel's key eco-factor. The natural terrain of the region was examined and used in the hotel's architecture as another factor to attract tourists.



*Figure 5: Image of Songjiang hotel completed and under construction (Source: Archdaily, Metro UK)*

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Figure 6: Songjiang hotel (Source: Archdaily)

### 3.3 Proximity Hotel



Fig 7: Proximity Hotel (Image source: Proximityhotel.com)

Figure 7 depicts the Proximity Hotel in Greensboro, North Carolina, which is regarded as one of the most ecologically friendly luxury hotels in the United States to date. Dennis Quaintance designed the hotel, which opened in 2007. On each level of the hotel, there is a 7,000-square-foot private event area, a large fitness studio, an outdoor swimming pool, and guest living quarters. Sustainable methods were included into the design of the constructed environment with the eventual goal of utilizing 40% less energy and 30% less water. Solar panels on the roof of the hotel capture heat from the sun and create heat for the hotel's whole water system. In order to increase efficiency and sustainability, the hotel also employs cutting-edge technology. This involves the installation of Otis' Gen2 elevator, which will help to cut energy use. Elevators only require energy when ascending. The rationale for this is because the system may catch the energy created as the elevator descends and transfer it back into the building's internal electrical grid. For refrigeration, the hotel also employs a geothermal cooling system. To minimize water use,



high-efficiency Kohler plumbing fittings were fitted. Watering the landscape and vegetation is also done with a drip irrigation system.



Fig 8: Proximity Hotel's Courtyard (Image source: Proximityhotel.com)

Aside from its architectural value, the structure was created with big windows and guestrooms with 10-foot ceilings. The practical goal is to enable and supply enough of natural light and fresh air in the rooms. Local and repurposed materials were employed for the interior décor of the guestrooms. Shelves and tabletops, for example, were built from walnut veneer and recycled wood pulp. Green vegetation on the rooftop was incorporated into the design to offer food for the hotel restaurant and to decrease the impact of urban heat islands. The use of native flora in the hotel's environment minimizes water use since the plants can quickly adapt to the local rainfall without the need for further irrigation. Sustainable methods in restaurants include the use of sensor-controlled ventilation for the kitchen, which can detect heat and smoke and alter its fan speed to meet the load. The hotel's furnishings are also built from recycled and local resources (for example, tabletops are made from reclaimed walnut). The hotel also has plenty of outside terrace eating places to give natural light and fresh air (Wright 2010).

#### **4. Principles of Biomimicry**

Janine M. Benyus's book *Biomimicry: Innovation and Design* is named *Biomimicry: Innovation and Design*. Inspired by nature, nine natural principles were identified, which are also the fundamental concepts underlying the notion of biomimicry. Nature operates on sunshine; it uses just the energy it requires; it fits form to function; it recycles everything; it encourages collaboration; it depends on diversity; it wants local competence; it controls excesses from within; and it exploits the force of limitations. The Biomimicry Institute, on the other hand, proposed biomimicry principles, which are an enlarged and complete version of nature's principles. These principles are abstracted biological techniques, some of which are clear and self-explanatory, that can be found in the majority of species and allow life to succeed in

recreating itself. They are innovative common techniques for assessing the sustainability of biomimetic designs, materials, and applications. They are key checklists to follow in order to ensure that biomimicry is used in a way that produces long-term results. The six (6) primary principles of biomimicry are as follows:

1. *Effective use of resources (materials and energy)*

This is the skillful and careful use of resources and opportunities. It is composed of four (4) principles: using multifunctional design (meeting multiple needs with one elegant solution); using low energy processes (reducing required temperatures, pressures, and/or time for reactions); recycling all materials (keeping all materials in a closed loop); and fitting form to function (selecting shape or pattern based on need).

2. *Adapt to changing circumstances*

This is an example of correctly adapting to changing situations. It is composed of five (5) principles: maintaining integrity through self-renewal (persist by constantly adding energy and matter to heal and improve the system); embodying resilience through variation, redundancy, and decentralization (maintain function following disturbance by incorporating a variety of duplicate forms, processes, or systems that are not exclusively located together); and incorporating diversity (include multiple forms, processes, or systems to meet a functional need).

3. *Locally attuned and responsiveness*

This is blending in with and merging with the surroundings. It is composed of five (5) principles: use readily available materials (build with abundant, accessible materials); harness freely available energy (use solar/renewable energy); cultivate cooperative relationships (find value through win-win interactions); leverage cyclic processes (take advantage of phenomena that repeat themselves); and use feedback loops (engage in cyclic information flows to modify a reaction appropriately).

## 5. Conclusion

The use of biomimicry ideas in the design of touristic facilities has already resulted in the construction of numerous remarkable projects that are visually beautiful, sustainable, and deliver the distinctive and high-quality experiences that luxury visitors want. The study highlighted numerous examples of luxury travel initiatives that incorporated biomimicry ideas. According to the findings of the study, biomimicry design and construction approaches can increase the performance and appeal of luxury travel facilities. To provide greater value to the owners of luxury travel facilities, architects, engineers, and construction experts are advised to comprehend and use biomimicry methods as mentioned in this article.

Although the use of biomimicry can lead to the creation of creative building or material manufacturing technologies, techniques to boost sustainability have yet to be fully explored. So, in order to tackle the current difficulties, a new integrated architecture is necessary, in which buildings and nature will adapt to environmental circumstances and encourage biodiversity, rather than being a mere replica of natural forms. The solution rests in the discovery of appropriate biological systems, as well as collaboration and collaboration within the domains of engineering, design, and biology, in order to build a more sustainable world.

### **Recommendations**

- There is a methodological framework that is followed through three levels of nature, organism, behavior, and ecological system, as formation has dimensions that are: form, material, and construction, to make nature the right course to go through for constructing an environmentally reactive and balanced building. The design process has a technique of operation while maintaining environmental balance; nevertheless, without function and sustainability, it is impossible to minimize revenue consumption and adapt to the external environment.
- The key advantage of biomimetic hotel architecture is that it would improve overall environmental performance. It would also be applicable on a variety of spatial and time scales, and this is seen to be a solid starting point for a building design that is really sustainable and regenerative of a specific location.
- According to studies, when designing a sustainable hotel building, nature should be viewed as a source of inspiration and mimicry, providing the designer with the course of work leading to the ideal situation, which means that buildings should multiply their systems, treating their wastes, generating their energy, and achieving comprehensive aesthetic formations over time.
- The architect can take natural or previous configurations or copy them, allowing nature to show itself in the design and come to the surface through the form of flowers and birds and the touch of materials, or even the characteristics that facilitate natural light and ventilation and represent into buildings.
- Designers must consider the natural context of the site rather than imagining it as isolated and so divorced from the ecosystem in which it is located in biomimetic design (see Songiang Hotel).

Architect implications: Architects should strive to apply additional research and design imperatives that consider the natural and constructed environment in which their design concept will be implemented.

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