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The Relationship between Green Architecture and Vernacular Architecture

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ABSTRACT

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THE RELATIONSHIP BETWEEN GREEN ARCHITECTURE AND VERNACULAR ARCHITECTURE

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Abstract

In order to, usage of sustainable concepts and sustainable development in architecture, Green architecture is shaped in line with environmental attitudes and nature's respect for its features. In addition to protecting the environment, comfort is important for humans, and the result, a building designed with the smallest incompatibility with the natural environment around itself and in the wider area than the world. Now upcoming a question: is there a relationship between green architecture and vernacular architecture in the world's buildings? To answer it, this research is in the field of fundamental and theoretical and has been done based on descriptive-analytic method and library studies. That the important result is avoiding vernacular architecture now and the need more attention to green architecture as vernacular architecture.

Keywords: *Green Architecture, Vernacular Architecture, Environment, Material, Energy*

1. Introduction

Green Architecture is the first comprehensive guide to the work of architects and designers who represent the cutting edge of sustainable, or “Green” architecture.

Since the first humans decided that woven leaves would make a better rain shield than the more random protection of a tree, shelter in its many and diverse form has been key to cultural development. But, while we know and applaud the makers of the great buildings that come from these simple beginnings, the creators of the more humble “vernacular architecture” remain anonymous.

We humans have an amazing ability to innovate. Nowhere is this more apparent than in the world's diverse range of handmade or vernacular buildings.

Vernacular architecture is a subject that provides a window on the lives and traditions of the indigenous people of our world, and in so doing creates a mirror that reflects our own experiences. This, in turn, helps us to understand more clearly where

the buildings of our contemporary world spring from, or more importantly why such buildings so often fail to meet our fundamental human needs.

It takes little imagination to appreciate the disastrous long-term effects that for example, high-density, high-rise housing has had on the communities and social cohesion of our world's cities. The notion that houses should be “machines for living” long resonated in the mindset of money planners and architects. Education systems provided an aesthetic awareness and certain expertise. Rationally applied building technology and forms matched the required “function” of the building. Solutions were fixed, immovable and sold as a modern utopian ideal to the world's aspiring urban classes.

However, if we look at both current and historical vernacular building traditions, there exist opportunities to learn of solutions to our housing needs that draw less on limited resources available to us. These impact more gently on our fragile ecosystems, offering solutions that

engender a profound connection between the builders, their environment, the material used, and the wider community. Much has been written and indeed understood, about human-scale architecture and the need to limit the environmental impact of the building industry. However, the truly sustainable practitioners are still widely ignored by the majority of the establishment, where the champions and practitioners of the vernacular building are still marginalized, either through misinformed opinion or by the forces of property speculation and planning policy.

It may be that notion of tradition leaves people feeling uneasy, with associations to a world of convention and constraint, such that tradition belongs to a place in the past, inhabited by the ghosts of disapproving ancestors. However, tradition can also be our guide and teacher, and provide the template for architectural solutions that can stretch the imagination far beyond the seemingly rational.

In a world where the politicians and the policymakers are struggling to find effective solutions to the problems that threaten the very existence of our world, it is time for an individual to take the initiative and look seriously at the creativity inherent in the vernacular buildings of our world.

In recent years, the reason for sustainability concept has become the common interest of numerous disciplines is top form the sustainable development. Green architecture strives to minimize the number of resources consumed in the buildings construction, use, and operation, as well as curtailing the harm done to the environment through the emission, pollution, and waste of its components.

Sustainability is comprehensive therefore a complex subject. It is of vital importance to all because it deals with the survival of

human species and almost every living creature on the planet. Sustainable and eco-friendly architecture is one of the main aims that humans for creating a better life have made as the ultimate model for all their activities. For this reason, moving toward a greener architecture is well-thought-out the main goal of the present architecture of our time.¹

Green architecture, or green design, is an approach to building that minimizes harmful effects on human health and environment. The “green” architecture or designer attempts to safeguard air, water, and earth by choosing eco-friendly building material and construction practices.²

2. Literature Review

2.1. Definition of a green building:

A green building can be loosely defined as one that has minimal impact on the environment. Also known as green construction, a sustainable building refers to both a structure and the using of processes that are environmentally responsible and resource-efficient throughout a building’s life-cycle: from sitting to design, construction, operation, maintenance, renovation, and demolition. Ideally, the green building preserves and restores the surrounding habitat that is vital for sustaining life and then becomes a net producer and exporter of resources, materials, energy, and water (rather than being a net consumer). Green building construction and operation assures the healthiest and most efficient (meaning least disruptive) use of land, water, energy, and resources.

2.2. Green architecture’s characteristics (features):

- Ventilation systems designed for efficient heating and cooling.
- Energy-efficient lighting and appliances.
- Water-saving plumbing fixtures.

- Landscapes planned to maximize passive solar energy.
- Minimal harm to the natural habit.
- Alternate power sources such as solar power or wind power.
- Non-synthetic, non-toxic materials.
- Locally-obtained wood sandstone.
- Responsibly-harvested woods.
- Adaptive reuse of older buildings.
- Use of recycled architectural salvage.
- Efficient use of space.

Most green buildings do not have all of these features, the highest goal of green architecture is to be fully sustainability.

2.3. Elements of green building design:

- Site and its surroundings
- Energy Efficiency
- Water Efficiency
- Material Efficiency
- Indoor Air Quality
- Waste Reduction
- Low maintenance costs

2.3.1. The principles of green building design:

The process of green building design with an intimate understanding of the site in all its beauties and complexities. An ecological approach to design aims to integrate the systems being introduced with existing on-site ecological functions performed by Mother Nature.

These ecological functions provide habitat, respond to the movements of the sun, purify the air as well as catch, filter and store water. Designers can create features in their buildings that mimic the functions of particular eco-systems. Species that thrive in natural ecosystems may also utilize habitats created in man-made structures. Creating new habitat on structures in urbanized areas is especially important to support bio-diversity and a healthy ecosystem.³

- Water System
- Natural Building
- Passive Solar Design
- Green Building Material
- Living Architecture

2.3.1.1. Water System:

Water - often called the source of life - can be captured, stored, filtered, and reused. It provides a valuable resource to be celebrated in the process of green building design. only about six percent of the water we use is for drinking. There is no need to use potable water for irrigation or sewage. The Green Building Design course introduces methods of rainwater harvesting, greywater systems, and living pools.

The protection and conservation of water throughout the life of a building may be accomplished by designing for dual plumbing that recycles water in toilet flushing or by using water for washing of the cars. Waste-water may be minimized by utilizing water conserving fixtures such as ultra-low-flush toilets and low-flow shower heads. Bidets help eliminate the use of toilet paper, reducing sewer traffic and increasing possibilities of re-using water on-site. Point of use water treatment and heating improves both water quality and energy efficiency while reducing the amount of water in circulation. The use of non-sewage and greywater for on-site use such as site-irrigation will minimize demands on the local aquifer.⁴

2.3.1.2. Natural Building:

A natural building involves a range of building systems and materials that place major emphasis on sustainability. Ways of achieving sustainability through natural building focus on durability and the use of minimally processed, plentiful or renewable resources, as well as those that, while recycled or salvaged, produce healthy living environments and maintain indoor air quality. Natural building tends

to rely on human labor, more than technology. As Michael G. Smith observes, it depends on "local ecology, geology, and climate; on the character of the particular building site, and on the needs and personalities of the builders and users."⁵ The basis of natural building is the need to lessen the environmental impact of buildings and other supporting systems, without sacrificing comfort for health. To be more sustainable, the natural building uses primarily abundantly available, renewable, reused or recycled materials. The use of rapidly renewable materials is increasingly a focus.

2.3.1.3. Passive Solar Design:

Passive solar design refers to the use of the sun's energy for the heating and cooling of living spaces. The building itself or some element of it takes advantage of natural energy characteristics in its materials to absorb and radiate the heat created by exposure to the sun. Passive systems are simple, have few moving parts and no mechanical systems, require minimal maintenance and can decrease, or even eliminate, heating and cooling costs. Homes in any climate can take advantage of solar energy by incorporating passive solar design features and decreasing carbon dioxide emissions. Even in cold winters, passive solar design can help cut heating costs and increase comfort.⁶

2.3.1.4. Green Building Material:

Green building materials are generally composed of renewable rather than non-renewable resources and are environmentally responsible because their impacts are considered over the life of the product. In addition, green building materials generally result in reduced maintenance and replacement costs over the life of the building, conserve energy, and improve occupant health and productivity. Green building materials can be selected by evaluating characteristics such as reused and recycled content, zero or low off-gassing of harmful air

emissions, zero or low toxicity, sustainably and rapidly renewable harvested materials, high recyclability, durability, longevity, and local production.⁷ The materials common to many types of natural building are clay and sand. When mixed with water and, usually, straw or another fiber, the mixture may form cob or adobe (clay blocks). Other materials commonly used in the natural building are earth (as rammed earth or earthbag), wood (cordwood or timber frame/post-and-beam), straw, rice-hulls, bamboo, and stone. A wide variety of reused or recycled non-toxic materials are common in natural building, including urbanite (salvaged chunks of used concrete), vehicle windscreens and other recycled glass.⁸

2.3.1.5. Living Architecture:

The environment like our bodies can metabolize nutrients and waste. Living Architecture focuses on these processes, integrating ecological functions into the buildings to catch, store, and filter water, purify air, and process other nutrients. Living Architecture also addresses biophilia, the documented health benefits associated with being in touch with living systems in the built environment.⁹

Throughout history greening of outside walls and roofs of buildings has taken place. Reasons for doing so were the increase of insulation (keep cool in summer and keep cold out in winter), improved aesthetics, improved indoor and outdoor climate, reduce the greenhouse gases such as Carbon Dioxide (CO₂), Carbon Monoxide (CO) and Nitrogen Dioxide (NO₂) as well as increasing ecological values by creating habitats for birds and insects.¹⁰

3. Research Methods

This fundamental and theoretical research in the field and the descriptive-analytic method and library studies conducted. Accordingly, the recognition of the green architecture and its features in relation to

vernacular architecture has been considered.

4. Analysis & Results

4.1. Green Building In The World:

No one knows exactly, or even approximately, how many buildings there are in the world, but estimates of well over a billion have been made. Of these, eighty percent or more are estimated to be vernacular buildings. Put another way, buildings designed and built by professional architects and builders constitute only small part of world's built infrastructure. The vast majority of people in the world live in homes and use buildings that they and their friends and family have built themselves.¹¹

This is obviously more true in some countries and regions than in others. In the part of the world, planning restrictions limit self-building, the land is expensive and the traditions of forebears and ancestors have been marginalized (exploited), their skills lost and forgotten. In the large parts of the world, people are closer to their vernacular architecture, and in many cases are still living in it and building it. However, the situation is changing fast. The rush (offense) to modernization means that more people than ever before are moving cities, where vast numbers now live in squatter settlements where they construct houses from waste and scrap. This is the new vernacular architecture of our time.

All over the world, meanwhile, traditional vernacular architecture is disappearing, not only the building forms themselves, but also the knowledge, skills, and customs behind their creation.

Any examination of the vernacular building is full of surprises and, by its very nature, is interdisciplinary. These buildings do not exist in a vacuum – they are built as part of people's lives and culture. These structures are shaped not only by physical

circumstances and available materials but also by the beliefs, myths, customs and traditions of the tribe, clan or group that builds them. Early vernacular shelters were more respect, nothing the ingenuity employed to fashion functional and aesthetically pleasing structures with simple tools.

The vernacular design must be fit for purpose. Nomadic peoples build lightweight structures, which can easily be packed up and reassembled; sedentary peoples build permanent homes that can last five hundred years, during which time they are constantly renewed and adapted to suit changing requirements. As a general rule vernacular builders aim to stay warm in winter and cool in summer, and they have devised numerous ingenious techniques for achieving those ends.

4.1.1. Building of Europe & Eurasia:

Researcher's journey across Europe and Eurasia commences in the far north with the different forms of shelter used by the Sami people. They highlight two forms of earth buildings, found at the extreme ends of their territory, and the cruck timber frame, of which Britain has the greatest density in the world. They profile the giant house barns of northern Germany and the unique wooden churches of Ukraine, as well as the many forms of izba, found across vast swathes of Russia. In addition, they admire the working windmills of the Netherlands and the practical and elegant hayracks and bee-houses of Slovenia.¹²

4.1.2. Building of The Mediterranean & Middle East:

The Mediterranean is ringed with cave dwelling and cave houses of various form, many which have ancient roots. Drystone architecture is another widespread building type, most beautifully expressed in the Trulli of southern Italy. The ubiquitous black tent serves not only the Bedouins, but nomadic groups across a huge area of northern Africa, the Middle East and

beyond. It survives in the modern age, unlike the reed houses of Marsh Arabs of Iraq, whose whole culture is under threat. The impressive earth towers of Yemen and the ingenious wind catchers of Iran offer lessons for modern architects seeking to build in hot, inclement climates where water is scarce.¹³

4.1.3. Building of Asia:

The beautiful traditional building and woodworking skills of Japan are highlighted in our profiles of townhouses and urban minkas. We investigate tulou of Fujian, fortified buildings large enough to hold an entire clan of people. On the roof of the world, we visit the gers of Mongolian, supreme examples of nomadic shelter, and celebrate the conservation and the restoration of some remarkable buildings in old Lhasa in Tibet. India's wealth of vernacular structures is represented by the impressive stepped ponds and stepwells of Rajasthan and the barrel-vaulted huts of the much-studied Toda people in the south.¹⁴

4.1.4. Building of Africa:

One of the most impressive buildings in the whole of Africa, the Great Mosque of Djenne, symbolizes and celebrates the innovative earth architecture of Mali. The distinctive toleaks of the Mousgoum people and the Batammaliba roundhouses display similar qualities on a human scale. Stilt dwellings are the only housing solution for the people of Ganvie, dubbed the "Venice of Africa". The Rendille herders shelter in wheel-shaped tents, while the Zafimaniry people of Madagascar build houses from bamboo and wood that evolve into a more permanent form as the relationship of its married owners deepens. In the south, the Zulu's beehive indlus and the painted houses of the Ndebele are widely celebrated as expressions of their differing, but equally vibrant, cultures.¹⁵

4.1.5. Building of North America:

The Inuit igloo and the plains Indian tipi have immediate cultural resonance and both are justly recognized as supreme examples of simple shelters of great ingenuity. Less well known are the striking forms of the Haida plank houses, decorated with vibrant paintings and crowned with the first totem poles. Log cabins come in all shapes and styles, as do the big barns of the North American landscape and the early settlers building forms – the I-house, cracker house and saltbox house. The shakers devised their own architectural language of un-adorned shape and form, which remains highly influential. The adobe houses of New Mexico, designed for desert climates by the Pueblo peoples, have now become an internationally recognized style.

4.1.6. Building of Latin America:

In the mountains in south of Mexico, the Tzotzil people live in small villages of thatched dwellings with four-sided roofs, while in the Amazon the Yanomami combine their individual dwellings into one huge circular shabano. In the Caribbean, former African slaves invented the first mobile home, the chattel house, which could be disassembled and moved at short notice. In the highlands of Colombia, unique buildings combining bamboo structures with adobe and stone are being studied for their ability to survive earthquakes. High on lake Titicaca in the Andes Mountains, the Urus people live on floating islands in houses made of reeds. And in southern Chile, a unique set of wooden churches has been recognized by UNESCO as a World Heritage Site.¹⁶

4.1.7. Building of Australasia & Oceania:

The scattered islands of Oceania have each developed their own style of vernacular buildings, they range from the octagonal house of the Kalinga, and the umbrella-

shaped fale tele of Samoa to the boat-shaped dwellings of the Toraja and the extraordinary spirit house of the Abelam. In Bali, Courtyard houses encompass an entire extended family's dwellings. In New Guinea, the Korowai people are still living in treehouses. In Australasia, the Maori meeting-houses are still alive and vibrant in modern times, whereas the many and various Australian Aboriginal shelters have virtually disappeared.¹⁷

4.1.8. Modern Vernacular Architecture:

By far the most numerous vernacular buildings of the modern age are the ad hoc constructions of the millions of urban squatters living in urban environments across the developing world. In the west, the pressure is on to develop forms and styles of building in tune with the environment, which is energy-and water-efficient, made of low carbon and non-toxic materials. Earthships use waste tires filled with rammed earth for walls and there is a long tradition of buildings made from bottles. Virtually all the material for Ben Law's Woodland House in West Sussex, England, came from the wood itself or the surrounding area. The interest in reviving old vernacular building skills is illustrated with the cob revival and an African scheme to build vaulted roofs without using wooden supports.¹⁸

5. Discussion & Conclusion

Green design is practical to solve problems, in which natural resources before, after and during production and manufacturing process to the least damage, plus in the course of this action materials should be useful, have a long shelf life and can be reversible to the cycle of nature. Life-long things are useful and the biggest obstacle to waste products and squander, and this is better than reuse or recycling.

Now is the time when resources are in decline, when architects, landscape architects, urban designers, engineers and

building specialists are fundamentally concerned about the future. Designer specialists should expand their field of expertise and expertise in this field, protecting them from sources and supporting the future of children, grandchildren, and future generations.

Buildings must be designed to be able to use the climate and local energy sources. The shape and manner of deployment of the building and the location of its interior spaces can be such that it improves the level of comfort inside the building, while at the same time reducing the consumption of fossil fuels through the proper insulation of the structure. These two processes have inevitable overlaps and common points.

Today, each building should be designed in such a way as to minimize the use of new resources and, after destruction, also be the source of other structures, given that there are not enough resources to create artifacts in the world that can be used to reconstruct each A generation of buildings used a new amount of them can be achieved by reusing recycled spaces and materials.

Reasonable use of natural resources and proper construction management helps to maintain limited natural resources and reduce energy consumption and improve the quality of the environment. The design quality is stable. Good quality regardless of nature and the use of durable materials should also be considered.

Achieving the highest standards of quality, safety and comfort that actually provides human health are one of the major goals of green architecture that is achieved through the use of efficient management and the use of the latest technologies.

Today, our architecture tries to be redesigned with the design of vernacular architecture. So we have to learn more

about this architecture and use it all over the world.

We must know that vernacular architecture is an introduction to green architecture.

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