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Sustainable architecture and tourism management

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Abstract

Sustainable architecture is a general term that describes environmentally conscious design techniques in the field of architecture. Sustainable architecture seeks to minimize the negative environmental impact of buildings by enhancing efficiency and moderation in the use of materials, energy, and development space. The idea of sustainability, or ecological design, is to ensure that our actions and decisions today do not inhibit the opportunities of future generations. Today tourism is an important component of development, not only in economic terms but also for knowledge and human welfare. Given the inevitability of the tourism industry as an economic phenomenon, bound to expand globally, we have to find a way to make it sustainable. Current study is an attempt to discuss the role of sustainable architecture for the development of tourism in the context of Kerala.

Keywords: Sustainable architecture | Ecological design | Waste management

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Introduction

Tourism is one of the most expanding, fastest growing, most rewarding industries of the modern world. International tourism constitutes the invisible export trade. No wonder then that some more enterprising countries have turned this flourishing industry into a means of spinning money. In recent years, India too has woken up to this great reality and concerted efforts are being made to develop and promote this foreign exchange earning industry in a big way. Today tourism is an important component of development, not only in economic terms but also for knowledge and human welfare. Tourism has long ceased to be strictly just for the privileged few and nowadays is an activity accessible to a growing number of people and societies. During the early part of human history, man would have travelled under compulsion primary to satisfy

his biological needs. In the subsequent periods, the emergence of empire gave impetus to travel for political, business, social and religious. Traveling during those times was difficult because of the antiquated transport facilities and lack of safety and comfort in route (Thakar, 2004).

The tourism industry has nevertheless given rise to some serious problems, including social costs and ecological impacts. Many ancient local cultures have lost their identities. Their societies have orientated their economy only to this industry. Both natural and cultural landscapes have also paid high price forms of tourism. These problems will persist if short-term economic benefits are the only objective in mind, leading to economic gains that eventually become ruinous.

In tourism, the design of buildings i.e., architecture played a very important role. The concept of sustainability is also dominated the architecture and thus sustainable architecture turned to be a highly appreciable thing by the tourists. The concept of Green building revolves around energy efficiency, environmental impact, water management, renewable energy and use of green building materials. The tourists are preferred to visit and stay the place where the buildings are built in sustainable architecture. The present paper discusses the importance of sustainable architecture for the promotion of tourism and environment.

Tourism in the modern world

The past two centuries have witnessed an increase in the commoditization of tourist sites across the world. Everything from historical monuments to exotic holiday destinations has been redesigned and packaged for mass consumption. As a result, the histories of specific sites have been re-conceptualized. Some have been preserved and celebrated, while others have been left to decay. In this process, buildings, cities and entire countries have been remapped by tourism initiatives to serve political, cultural, economic and scholarly goals. Considering these profound transformations, Architecture and Tourism examines the reciprocal relationship between the modern practice of tourism and the built environment.

The idea of sustainable development

The concept of sustainable development has become widely accepted as the way to a better, more humane and socially responsible future. In parallel, the tourism sector is becoming increasingly important in the global economy. The grand, but elusive, concept of sustainable development in which environmental considerations are integrated with, strives for social and economic development received widespread international attention through the launching of the World Conservation Strategy in 1980 and the presentation of the report *Our Common Future* in 1987 (WCED, 1987). In 1987, the United Nation's World Commission on Environment and Development (WCED), known as Brundtland Commission, met to create a vision called Our Common Future that was based upon sustainability. From this effort the definition of sustainability development as "Meeting the needs of the present without compromising the ability of future generations to meet their own needs". The green economic report initiative by the UNEP gives convincing evidence for policy makers, designers and leaders from all arenas of society invest in a design with clean technologies, renewable energy, natural materials and infrastructure (WCED, 1987).

The goals of economic and social development must be defined in terms of sustainability in all countries developed or developing, market-oriented or centrally planned. Interpretations will vary, but must share certain general features and must flow from a consensus on the basic concept of sustainable development and on a broad strategic framework for achieving it. Development involves a progressive transformation of economy and society. A development path that is sustainable in a physical sense could theoretically be pursued even in a rigid social and political setting. However, physical sustainability cannot be secured unless development policies pay attention to such considerations as changes in access to resources and in the distribution of costs and benefits.

In essence, sustainable development is a process of change in which the exploitation of resources, the direction of investments, the orientation of technological development; and institutional change are all in harmony and enhance both current and future potential to meet human needs and aspirations. At the start of the twenty-first century, the problem of global sustainability is widely recognised by world leaders, and a common topic of discussion by journalists, scientists, teachers, students and citizens in many parts of the world. The World Summit on Sustainable Development, confirmed that the first decade of the new century, at least, would be one of reflection about the demands placed by humankind on the biosphere.

The concept of sustainability has become central to all aspects of development planning. The essential prerequisite of sustainable development is to meet the needs of the present without compromising the ability of future generations to meet their own needs. It is a particularly pertinent concept as far as tourism is concerned because tourism is often in danger of destroying the resource base upon which it depends. There is a circular and cumulative relationship between tourism development, the environment and socio-economic development.

Agenda 21 is a non-binding, voluntarily implemented action plan of the United Nations with regard to sustainable development. It is a product of the UN Conference on Environment and Development (UNCED) held in Rio de Janeiro, Brazil, in 1992. It is an action agenda for the UN, other multilateral organizations, and individual governments around the world that can be executed at local, national, and global levels.

Sustainable architecture

Architecture is one of the man's highest achievements, reflecting the culture of the times. The architects and builders have a great responsibility in ensuring that green principles are actually being applied rather than just being paid lip service as the construction industry accounts for 50 % of the green house gas emission and a sizeable chunk of all other kinds of environmental impacts. Moreover, with the recent failure of the global political domain, to bring all the nations under a roof and bind them with laws and mutual agreements upto green concepts, the burden of responsibility the architect community shoulders increase manifold.

The 21st century is the century of environment and sustainable development. Today architects and city planners are expected to think up new neighborhoods and cities, new public spaces, new means for production of historical urban heritage and transform land into a city with superior living conditions and in an

environmentally-friendly manner. Sustainable architecture is a general term that describes environmentally conscious design techniques in the field of architecture. Sustainable architecture is framed by the larger discussion of sustainability and the pressing economic and political issues of our world.

Sustainable development measures success in terms of economic, environmental and social benefits. The building industry expanded on this concept, and applied it to "the building environment", creating the term sustainable building. The term sustainable building is used interchangeably with Green building. Its purpose is to reduce the adverse human impacts on the natural environment, while improving our quality of life and economic well-being.

In the broad context, sustainable architecture seeks to minimize the negative environmental impact of buildings by enhancing efficiency and moderation in the use of materials, energy, and development space. The idea of sustainability, or ecological design, is to ensure that our actions and decisions today do not inhibit the opportunities of future generations. The term can be used to describe an energy and ecologically conscious approach to the design of the built environment.

If sustainability is to be given a shape, it will be a circle. Any aspect of living that can keep moving in a circle without interfering with objects outside this circle can be termed as sustainable. The key to architectural sustainability is to work with, rather than against Nature; to be sensitive so that we do not damage the natural systems. Architectural sustainability mirrors the view that it is necessary to position human activities as a non-damaging part of the ongoing ecological landscape, with a belief that 'nature knows best' (Turab, 2012). It is important to address sustainable architecture because the practice is almost non-existent in Indian cities. In addition, there seems to be some ambiguity on what exactly constitutes sustainable architecture.

A worldwide, frequently urban, phenomenon where internationally renowned architects are lured to design buildings intended to attract tourists as much as, if not more than, locals. But now in both urban and rural areas, buildings are designed by architects based on sustainability principles in order to attract the tourists worldwide (Ockman & Frausto, 2005). In designing environmentally optimal buildings, the objective is to minimize the total environmental impact associated with all life-cycle stages of the building project. A variation of every design variable may affect the environment during all the building's relevant life-cycle stages. As high-performance buildings use less operating energy, embodied energy has assumed much greater importance – and may make up as much as 30% of the overall life cycle energy consumption.

Reducing water consumption and protecting water quality are key objectives in sustainable building. One critical issue of water consumption is that in many areas, the demands on the supplying aquifer exceed its ability to replenish itself. To the maximum extent feasible, facilities should increase their dependence on water that is collected, used, purified, and reused on-site. 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. Wastewater may be minimized by utilizing water-conserving fixtures such as

ultra-low flush toilets and low-flow showerheads.

Solid wood products, particularly flooring, are often specified in environments where occupants are known to have allergies to dust or other particulates. To reduce the impact on wells or water treatment plants, several options exist. "Greywater", wastewater from sources such as dishwashing or washing machines, can be used for subsurface irrigation, or if treated, for non-potable purposes, e.g., to flush toilets and wash cars. Rainwater collectors are used for similar purposes. Centralized wastewater treatment systems can be costly and use a lot of energy. An alternative to this process is converting waste and wastewater into fertilizer, which avoids these costs and shows other benefits.

Buildings and development affect water quality, air quality and ecosystems, impacting human health and quality of life. The construction market is also responsible for the hazards of pollution, noxious waste, global warming, ozone layer depletion, deforestation and a whole array of related issues are being actively taken up for scrutiny by various organizations worldwide. It accounts for one-sixth of the world's fresh water withdrawals, one-quarter of its timber depletion, and two-fifths of its material and energy flows. Buildings also consume 60% of the world's electricity annually. Through careful planning, architects and other designers can build environmentally friendly buildings, which can save resources for both its operation and its construction. To achieve this, sustainable building applies principles of resource and energy efficiency, healthy buildings and materials, and ecologically and socially sensitive land-use to achieve an aesthetic sensitivity that inspires, affirms and ennobles.

Sustainable building has proven effective in minimizing industry impacts on air and water quality and protecting natural ecosystems. It has also been shown to increase building value by improving cost performance, enhancing occupant comfort and creating positive public perception. At its broadest, a sustainable environment will be healthy for its inhabitants, will be economic during its life span, and will be capable of adapting to society's changing needs. Buildings, as they are designed and used today, contribute to serious environmental problems because of excessive consumption of energy and other natural resources. However, buildings can be designed to meet the occupant's need for thermal and visual comfort at reduced levels of energy and resources consumption. Energy and resource efficiency in new constructions can be affected by adopting an integrated approach to building designs.

A building would be sustainable in every sense when not only the material but also the processes involved in the construction are sustainable environmentally and socially. In a country like India where the natural resources need to be optimized because of the high demand and scarcity on one end and on the other end availability of huge manpower base. Labour intensive construction techniques could be used with little mechanical use. This could create more green jobs and livelihood for many more while reduction in carbon emissions. In addition, the waste on site and off site needs to be managed wisely (Goth & Joseph, 2011).

Yet, at this precarious threshold, it is indeed a pity that Green buildings and green concepts are still a matter of speculation and much

debate in today's learned world. It is indeed high time that we break free from our nonchalance and take up green concepts and its implementation in a war footing to compensate the colossal damage already inflicted. The prime aim of sustainable architecture is to make our earth a better place to live in for us as well as our children.

Linkage of sustainable architecture and tourism

Architecture is a visual art, and tourism is often equated with site seeing. Sustainable architecture played a very important role in present-day tourism. Tourist prefers to stay in buildings with good light, and energy efficient facilities and built in natural environment. These type buildings have an added advantage in tourist business. Historically, the architecture of India has been more sculpture than architecture. The buildings of India have been to tell stories or elicit calm or religious understanding. The modern buildings create no feeling except that they are places of work and business. Using natural materials is less expensive and provides a natural tie to the surrounding environment. We should always look back before moving forward.

Tourism is a major economic force whose development can have a fundamental impact on societies and the environment, both positive and negative. Integration of sustainability into tourism policies is the fundamental step towards the development of a sound and long lasting tourism industry.

India and Kerala tourism

India, with her rich cultural heritage, ancient monuments, world famous temples, architectural masterpieces, wild animal sanctuaries and scenic spots, holds a great attraction for the tourists on the move. In the past, for many decades tourist traffic in India was confined 'to the northern region'. Taj Mahal at Agra, Fatehpur Sikri, Varanasi, Bodh Gaya, Jaipur and Khajuraho were the main tourist attractions. However, tourism was seldom treated as an industry and in respect of stay, food and sightseeing the tourists were treated like pilgrims.

Tourism has emerged as a dominant economic factor in India and in international horizon. With its economic and all other advantages, tourism can certainly play a determining role in the development of poorer economies, which suffer from an adverse balance of payment situation, a high degree of social backwardness, besides the other environmental problems.

Nature is the miracle and understanding this miracle is an art and mother of all art is architecture. India's vernacular architecture is the reflection of its culture and tradition. Our architecture is based on the concept of integrated architecture or Green Architecture, which is architecture that is respectful of nature and its resources and which also creates a pleasant and comfortable environment for its occupants. It is also bioclimatic architecture as the projects are oriented so that they enjoy good views and take advantage of natural light while avoiding severe solar conditions. They take advantage of favorable climatic conditions and integrate the construction in the land, as well as incorporating elements like recycling water, using renewable resources and earth sheltered roofs with plants. The objective is always to reduce energy consumption and to harmonize the building with its surroundings.

Tourism is a product-cum service that requires continuous trimming, moderation and updating

in a fiercely competitive international environment. Effective marketing is the key to the problems of development of tourism. Government of India set up the Indian Tourism Development Corporation (ITDC) in 1996. The State Governments have set up similar corporations in each State for e.g., Kerala Government established Kerala Tourism Development Corporation (KTDC) on 1 November 1966. These corporations are providing a unique range of tourist services. In India, the travel and tourism industry has really come of age. Tourism is presently India's third largest export industry after gem and jewellery and readymade garments. A recent survey conducted by the World Tourism Organization (WTO) listed twenty top tourist destinations globally. India is nowhere in the list of twenty.

India thus presents a gloomy picture in case of tourism industry, when judged against the booming global scenario; the country's share in world tourism has been far from encouraging. In India, civil unrest is a major problem to the business of tourism. Strikes in airlines or hotels, agitations or civil disturbances, communal riots and activities of militants and terrorists hamper the promotion of tourism. Crime is another problem.

Sustainable architecture and tourism in Kerala

With advancement achieved in the field of building science and technology, we are increasingly becoming aware of the importance of energy-efficient building design. Many a times one can find solution to optimize the use of resources and to achieve human comfort by critically evaluating the vernacular architecture of that place. In the traditional architecture, buildings were designed to achieve human comfort by using locally available building materials and construction technology which were more responsive to their climatic and geographic condition (Sarkar & Sharma, 2011).

Man has a biological make-up. Rene Dubois has observed that, "Some of man's deepest biological traits are governed by the movement of the earth around the Sun, others are connected with the movement of the Moon around the earth and still others result from the daily rotation of the Earth in its axis. All these fluctuations in biological characteristics probably derive from the fact that the human species evolved under the influence of cosmic forces that have not changed. These mechanisms become inscribed in the genetic code and persist today even when they are no longer needed under the conditions of modern life" (Jain, 1985).

India inherits a tradition of built forms that have 5000 years of history. The treasure prove of varied cultural influences that travelled to the Indian region gave many moods and postures, some of a permanent nature, to India's heritage. Village houses in Kerala are slope-roofed with Mangalore tiles and thatch to draw off and channel the continuous rain. Natural building materials available are granite, timber, clay and palm leaves. Timber is the prime structural material abundantly available in varieties in Kerala, ranging from bamboo to teak. The skillful choice of timber, accurate joinery, artful assembly and delicate carving of woodwork for columns, walls and roofs frames are the unique characteristics of Kerala's rural characteristics. Clay is used in many forms starting from-starting from construction of walls, in filling the timber floors and making bricks and tiles after pugging and tempering with admixtures (Saha

& Devadas, 2010). The most developed form the typical traditional Kerala rural house is a courtyard type-Nalukettu. Kerala has got the National Geographic rating its backwaters as the world's 23rd best destination in 2009.

The importance of sustainable development and building is manifold in the case of developing economies like India, considering the resources crunch they face. Switching to a sustainable outlook at the earliest would prove beneficial to reduce the number of energy guzzlers and environmental liabilities that exist in the form of buildings, which are now numerous in the developing nations. At par with international efforts to boost sustainable tourism, Kerala Government also took many steps to popularize sustainable architecture for boosting tourism in Kerala. Buildings are designed and constructed as per environmentally friendly norms. These buildings are resource-efficient throughout a building's life cycle. This requires the close cooperation of the design team the architects, the engineers, and the client at all project stages. The Green Building practice expands and complements the classical building design concerns of economy utility, durability, and comfort.

Although new technologies are constantly being developed to complement current practices in creating greener structures, the common objective is that green buildings are designed to reduce the overall impact of the built environment on human health and the natural environment by:

- Efficiently using energy, water, and other resources
- Protecting occupants health and improving employee productivity
- Reducing waste, pollution and environmental degradation.

A similar concept is natural building, which is usually on a smaller scale and tends to focus on the use of natural materials that are available locally. In addition, occupants were more satisfied with the overall building than those in typical commercial buildings were.

The use of bamboo, mud, fly-ash and many such materials in recent architecture are the ones which could provide us with a sustainable architecture. Mud has always been a symbol of the rural face. Limited natural resources need to be conserved and hence one should reuse and recycle materials and resources such as water. Preference for readily available materials from indigenous sources orientate the building activities at the regional level to self-reliance, energy saving, low production costs and minimum transportation costs.

It has always been assumed that mud is used only for poor homes and small structures while there have been examples of airports, embassies, hospitals and factories also done with mud. Another assumption associated with environmentally friendly materials like mud is that it is fragile and ephemeral material; while in reality mud buildings are the oldest in history and it has been used and experimented with centuries ago. Earth is flexible because it can be molded and shaped when wet, and rammed and pressed when moist, but it hardens when exposed to the sun making it a durable building material.

Even today mud is used in many ecologically sensitive construction sites (Goth & Joseph, 2011). Earth buildings are renewable in that sense because the material can be reused and recycled indefinitely as a building material and returned to the earth. Kerala's building

architecture has in the last one decade showed signs of heading backwards to earth and nature. The following case study amply substantiated the success of sustainable architecture the promotion of tourism.

Case Study: *Banasura Resorts, Wayanad*

The Banasura Resorts is in its kind, claimed to be the largest mud resort in Asia at Vellamunda in the bewitching backdrop of Banasura hills, 18 km away from Mananthavady in Wayanad district, Kerala. It nestling in 35 acres of greenery stacked with pepper, coffee and tea plantations and ponds. The 20,000 sq ft two-storey structure in the Banasura hills is made entirely out of mud with bamboo and coconut palm leaf roofs: a paean to Mother Earth.Tucked away at an altitude of 3500 feet above sea level in the hills of Wayanad in the Malabar region, the Banasura Hill Resort has been named Asia's largest 'earth' resort and is considered on of the 'greenest' destination in the Nilgiris biosphere. This mist-clad hill of Wayanad, Banasura is an ideal retreat for the traveller who looks for a more enriching experience than a mere vacation. Sprawling across a 35 acre eco-friendly farm, Banasura Hill Resort stands in the middle of a tropical forest with exotic flora and fauna.

It is owned by a Virginia-based software engineer from Kerala, whose company straddles two continents. Shankar Thiruvillakat initially thought of setting the place up as a getaway for his employees. But fired by the imagination of Eugene Pandala, one of India's best known architects who works with traditional building technologies and is an enthusiast for mud buildings, it became an audacious architectural marvel. When most of India's architects are designing energy-guzzling glass and chrome buildings that are supposed to mark the arrival of a new India, Pandala offers a different vision - the Wayanad earth resort is elegant and utterly modern. Tourists have begun trooping in already.

The proponents of mud houses are mostly driven by an urge to build environment friendly dwellings as well as address the question of depleting natural resources as manifested in the acute sand crisis in Kerala (Gopakumar, 2010). The mud to be used can often be excavated from the construction site as in the case of the Banasura Hill Resort. Built using mud excavated from the very site that it stands on, the resort is a fine example of rammed earth architecture, and a glowing tribute to vernacular construction methods. The mud is non-toxic, non-allergic, rot and termite proof, controls humidity and offers great sound isolation. Perhaps the crowning glory of the technology lies in the way it can balance fluctuations in temperature throughout the year, that is store both warmth and coolness.

People from the nearby Kurichiya village (See Figure 5) played a significant role during the construction of the resort, contributing their skill and expertise in building with mud. At Banasura, we believe in making optimal use of environmental resources, maintaining the ecological balance, and helping to conserve natural heritage and biodiversity. Thousands of Guadua bamboo saplings planted around the resort creates a bio fencing while improving the already pristine air quality. Vetiver grass planted in critical areas prevents soil erosion.

The Resort value and respect the socio-cultural identity of the local community. They intend to culturally sensitize our guests through interaction with the local community. They encourage guests to visit tribal villages closed

to the resort. This not only helps in the exchange of knowledge and wisdom between visitors and local residents, but also helps in inculcating in the host community a sense of pride in what they are.

Fig. 1: The exterior view of the resort at dusk

Fig. 2: Resort side view

Fig. 3: Inside the Resort

Fig. 4: Tourist cottage in the Resort

Fig. 5: Kurichiya Settlement near the Resort

The concept of the Banasura Resort is unique in many ways. No air-conditioners are needed as the mud walls act as an effective regulator of heat and cold. Moreover, there is a cooling stream flowing through the property (Padanna, 2010). Eco-friendly features include a bio-gas plant that recycles organic waste and fires the resort's kitchens. Also the resort is completely lit by CFL lamps to minimize energy consumption. The resort itself has been built from mud and recycled wood and natural light is exploited to the fullest. Limited natural resources need to be conserved and hence one should reuse and recycle materials and resources such as water. Preference for readily available materials from indigenous sources orientate the building activities at the regional level to self-reliance, energy saving, low production costs and minimum transportation costs.

Recycled wood is used for much of the woodwork and periodic anti-termite treatment is done using cashew-shell oil rather than chemical agents. Natural light is exploited to the fullest, while CFL lamps provide extra lighting, minimizing energy consumption. A bio-gas plant recycles organic waste and fires the resort’s kitchens.

Conclusion

The architecture of the future would be gauged not only on the hi tech technology it uses, the

heights it scales, the comfort it provides but also how efficient it is, how green it is and how much does it conserve, reuse and on how it reduces its carbon emission. The architecture and design of the future would not aim at standing from everything around but blend with earth and its surroundings as if it was an integral part of its own environment.

Natural landscapes and diversity are increasingly appreciated and the tourism industry must be able to respond to these aspirations. Sustainability has given prime importance in designing a building for tourist purposes. Architecture of the future would have to be based on the sustainable and practical use of the natural resources available to us. Architects and designers should constantly work at satisfying human needs for growth and prosperity while making our future sustainable with the limited natural resources that we possess. The architecture in the future would have to blend with the modern urban fabric, woven with the traditional cultural and sociological needs of the community.

Sustainable architecture is imperative in the development of tourist projects. The destruction of tourism resources for short-term gain will deny the benefits to be gained from mobilization of those resources in the future. The host populations will lose out the natural environment and thus will affect their future tourism prospects. Besides this, future generations of tourists will be denied the opportunity of experiencing environment. Tourism companies are increasingly responding to green consumerism and sustainable architecture to promote an environmentally friendly image in their marketing strategies. It is a *fait accompli* that the sustainable architecture will induce tourism and keep the nature intact.

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