

A CHANGE FOR THE BETTER

sustainability finally gets the green light from architects via the use of eco-friendly materials, environment-friendly designs and a carbon-neutral approach

At a time when concepts like 'climate change', the Paris Agreement and the 'New Green Deal' command global attention, it seems that the idea of sustainability, especially when it comes to architecture, is dominating the conversation. There is very little doubt among architects that they must now factor in sustainability when it comes to approaching, designing and executing a project.

Indeed, some have even made it their life's work to develop this particular category of architecture, while others have progressively begun to adopt such changes in their work. Says Ar. Rahul Kadri, Partner and Principal Architect, IMK Architect, Mumbai, "Sustainability focuses on meeting the diverse needs of the present and future, while being sensitive to the environment and contributing to a high-quality life. As the name suggests, we follow the local context of the region with indigenous building materials, architectural language and climatic considerations.

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hornbill house, mrigiri | biome environmental solutions, bengaluru



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powerhouse brattorkaia, norway | snohetta, oslo

We must cater to people of diverse age groups and social groups, providing for education facilities, social zones, relaxation spaces and entertainment options. It is important to have economic sustainability as well, for which we need adequate building entrepreneurs and financial facilities."

Ar. Kjetil Trædal, Founding Partner, Snohetta, Oslo, adds, "For a decade, we have researched and experimented with energy-positive structures that are net-carbon neutral over their life cycles. We focus on returning clean energy to society, offsetting the fossil energy and carbon dioxide footprint that otherwise exists in the energy grid."

Architects are now seeking to counter the drawbacks of conventional buildings and

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photography :: gauri satam and telesh patil

vrindavan, sindhudurg | untag architecture and interiors, mumbai

structures. According to Ar. Mitu Mathur, Director, GMPA, New Delhi, "Buildings typically consume large amounts of materials and produce waste; sustainably-designed buildings reduce environmental impact through energy and resource efficiency by changing perceptions of what spaces should look like."

Ar. Amarnath Duleep, Founder and Director, Chronicles of Mud, Pune, gives us a simpler explanation, "There are several interpretations to sustainability; if we were to forego the jargon, it is the need to preserve our natural environment and ecosystem to protect our species over the generations. Both the personal and collective come together on this concern. Rapid urban development disregards the delicate ecological balance that binds together the ecosystems. Thus, a paradigm

shift in the architectural methodology ameliorates land, resource and wild degradation while creating energy-efficient spaces for human habitation."

Finally, sustainable design works in favor of everyone, from clients to countries meeting their emission targets to Planet Earth, Ar. Sachin Rastogi, Founding Director and Principal, Zed Labs, New Delhi, explains, "Sustainable design prioritizes energy-efficient strategies, minimizes negative impacts, promotes healthy living and improves building performance. It aims to meet present needs without compromising on future requirements, such as by minimizing waste and reducing dependence on non-renewable resources. We can blend together vernacular and modern technology to develop environmentally-compatible and economically-viable buildings."

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sustainability: choice or necessity?

The architecture and design community devises strategies on how to minimize environmental impact with their projects, as they believe that it is their responsibility to do so. Ar. Anna Heringer, Founder, Studio Anna Heringer, Germany, says, “We must care for our resources and keep our planet safe for the coming generations, and it must be a series of everyday choices. It doesn’t have to be one epic decision; it could be something like, should we use environmentally-friendly paint and insulation material? Or, should we build large windows to bring in the sun and ventilation? Everything we do matters.”

Do extreme weather changes, a desperate need to save natural resources and the desire to be responsible customers result in a stronger push for sustainability? Ar. Rahul Kadri replies, “We have seen a rise in annual natural disasters all around the world, which has only increased the need for sustainable development. As per the Aon catastrophe report, titled ‘Global Catastrophe Recap: First Half of 2020’, there has been an increase of at least 27 per cent in natural disasters

recorded in the first half of 2020 as compared to the same period in 2019. Over the last 200 years, the world has witnessed an unprecedented migration of people from rural to urban areas. This ‘urban pull’ has created widening gaps between the growing city population and the physical and social infrastructure required to accommodate it – leading to a wastage of energy. Today, urban areas alone account for up to 70 percent of greenhouse gas emissions. There has been a massive shift in design strategies with an effort to develop ‘Green Building Concepts’, focusing on designing and maintaining sustainable buildings, minimizing the utilization of resources and prioritizing occupant well-being.”

Ar. Karl Johan Nyqvist and Ar. Alicia Casals San Miguel, Partners, Nomo Studio, Sweden, believe, “Companies have realized that they must have a green profile when pitching to new clients, which has pushed them into making a change. Secondly, many governments have already started with higher taxes on non-sustainable materials, waste and production – and it will be cheaper in the long run.”

house of silence, kalalgoda, sri lanka | damith premathilake architects, sri lanka



photography : ar. eresh weerasuriya

national institute of design, bhopal | gian p. mathur & associates pvt. ltd., new delhi



miner road house, california | faulkner architects and dzine concept, california

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jhopdi, pune | chronicles of mud, pune

Ar. Chaitanya Padal, Ar. Kinnera Varma and Ar. Radha Neela, Founders, Studio Inscape, Hyderabad give a modern perspective on Indian sustainability. They say, “We believe in modern regionalism, which is contextual, traditional and modern. Sustainability comes naturally to Indians, such as reusing palm and coconut tree leaves, fruits, husk, bark and shell to be used in multiple ways.”

Ar. Mitu Mathur, says architects must move ahead with the ecological environment around us. “Climate change, global warming and depletion of natural resources are chronic problems in modern life. Therefore, buildings must be carbon neutral. To achieve this, buildings must follow high-performance efficiency standards and produce renewable energy to counter less helpful emissions.”

Speaking from an Indian perspective, architects Gauri Satam and Tejesh Patil, Founders, Untag Architects, Mumbai, say, “Our Indian cities, in the tropics, face issues in the urban heat due to excessive use of glass without shading – causing heat and glare and increased energy consumption, leading to a higher carbon footprint. A reduced forest cover worsens the situation as greenhouse emissions on the rise, thereby making our cities disaster-prone. On the other hand, vernacular architecture teaches us how to live within nature, be self-sufficient and minimize our carbon footprint.”

Taking a more customer-centric outlook, Ar. Amarnath Duleep says, “The environmental crisis is worsening every year, but ecological awareness has risen exponentially. Therefore,

there are consumer-conscious choices that vote for sustainable products and practices. Consequently, both eco-entrepreneurship and eco-consumerism are on the rise in the architecture and design field.”

Our traditional systems seem to have the answer: Ar. Sachin Rastogi says, “The country’s architecture has employed several designs for energy-efficiency, such as jaalis (latticed screens), chajjas (sloping eaves and canopies) and jharokhas (overhanging balconies), particularly in India’s northern regions these address the need for lighting and ventilation – while protecting occupants from the harsh sunlight. Aangans (courtyards) facilitate air circulation and light,

along with thick walls acting as thermal buffers for reducing heat gain.

We must design the size and orientation of the buildings accordingly, such as window-shading devices with effective wall-to-window ratios and fenestrations to maximize daylight. Using local materials, water bodies and natural vegetation counteract the heat-island effect. Rainwater harvesting strategies such as recycling and reusing water for cleaning and horticulture are a vital step towards water conservation. Organic and inorganic waste should be separated and PV panels installed on the roofs to fulfill hot water requirements.”

manav sadhana activity centre and creche, ahmedabad | footprints e.a.r.t.h, ahmedabad





studio shed, pune | studio alternatives, pune



auric hall, aurangabad | imk architects, mumbai



hornbill house, nilgiri | biome environmental solutions, bengaluru



modern education and training institute, bangladesh | anna heringer, germany



crystal corporation pvt. ltd. office, new delhi | 42 mm architecture, new delhi

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what does it take?

Integrating green building concepts while planning a project can help achieve 'net-zero designs', which are energy-efficient and sustainable. Ar. Rahul Kadri agrees, "We must cut out materials that are not environment-friendly, which add to carbon emissions. Instead, our designs must include locally-available and natural materials, such as Compressed Earth Blocks (CEB). Buildings are designed to maximize natural light and ventilation through façade screens, shading devices and courtyards to reduce energy and maintenance costs. Rainwater harvesting, solar panels and sewage treatments are sustainable and renewable energy sources – along with natural vegetation."

Ar. Priyanka Khanna and Rudraksh Charan, Architects and Interior Designers, 42 MM Architecture, New Delhi, discuss the aesthetics of the space saying, "Using renewable resources such as natural light and planters accentuate visual appeal and spatial quality, along with recycled wood, cork and ceramic. Speaking of technology, energy-efficient lighting, double-glazed windows and automation optimizes energy consumption as per the user's need.

Finally, the space can be accessorized with revamped furniture, art from scrap materials and sourcing locally antique products."

Ar. Damith Premathilake, Principal Architect, Damith Premathilake Architects, believes, "Sustainability shouldn't be a secondary aspect; it must be incorporated into the project conception itself by minimizing footprint and orienting the building accordingly. We are inspired by traditional architecture such as water bodies, courtyards, light wells and repurpose materials for our designs. For our residential project in Diyathalawa, we have used reclaimed timber from pallet boxes as the primary material."

Architects Gauri Satam and Tejesh Patil, Founders, Untag Architects, Mumbai, focus more on solar orientation. They explain, "A building can be sensitively designed by studying the site's solar geometry and incorporating active and passive solar techniques. Software simulations to integrate passive solar strategies to assess the performance of a built form, rat-trap bonds for insulation and evaporative cooling reduce temperature."

a blend of materials and technology

Today, sustainability isn't simply a topic read about in books. Architects attribute their interest in sustainable architecture to genuine ecological concern, as Ar. Anna Heringer says, "Humans are deeply connected to earth on both a physical and psychological level; though concrete is helpful in many cases, we must prevent its overuse to cope with climate change. I believe that building with natural materials also brings a human touch to it, which gives birth to a community. Last but not the least, natural structures can return to the planet once they have outgrown their use."

Technology – it depends on the project – for certain structures, I rely on water and labour, while in other areas, I rely on machinery due to the high labour taxes. I believe in designing sustainable projects at the grassroot level, instead of simply building a structure with aluminium and steel, and just adding solar panels on top – it's unsustainable."

Ar. Amarnath Duleep adds, "Natural building involves the mason's constant engagement and attention, and we prefer manual work apart from a few power tools."

challenges and costs

Though sustainability is a long-term need, are we equipped to deal with it? Anna Heringer says, "If we simply trust that decay is a part of life and nature, we would cease to use cement, concrete, steel and waterproofing to make long standing buildings. Sustainable projects are expensive in Germany, and we need to ensure that sustainable raw materials are affordable enough for all to use. Local materials should not be taxed, as they give rise to the cheapest and most logical building designs – all we need to do is to educate ourselves."

Ar. Rahul Kadri says, "The initial cost of sustainable systems might seem high; however, one will enjoy the returns in the lifecycle cost of the project in the next five years. We have seen a significant advancement in the model and simulation platforms to simplify the process of designing sustainable buildings, such as BIM (Building Integrated Modelling) and software that assists in the lifecycle analysis of these structures. Finally, most architects see sustainability as the responsibility of the environmental consultant rather than as a part of the design.

Vernacular architecture such as placing longer facades facing the North and South, large windows that allow glare-free light, sunshades in the South West that prevent heat gain and open spaces are inexpensive alternatives. A courtyard and jaali screens aids in cooling, cross-ventilation and ample daylight while reduces artificial lighting and mechanical cooling." Speaking of the importance of rural communities, Ar. Amarnath Duleep says, "Rural areas are more favorable for sustainability, as local materials are readily available. Consumer bias and misconceptions are equally tough hurdles, especially when the clients choose readymade material such as cement. Also, skilled craftsmen for lime and bamboo are harder to find over people oriented towards conventional materials. Natural materials don't exhaust energy sources in their production, extraction and processing."

Architects Gauri Satam and Tejesh Patil add, "Apart from the lack of alternative technology and skilled karigars, solar photovoltaic cells, mechanical cooling systems and rainwater harvesting need



bamboo hostels, china | anna heringer, germany

a higher capital investment with long-term gains, and it could be difficult to convince a client. Use solar geometry for orientation, channelizing local breeze through cross-ventilation, recycling wastewater, recharging groundwater and bringing in natural light to reduce costs in a sustainable project.”

Pointing to the reality of building in a less developed country, Ar. Mitu Mathur says, “India is a developing country, and it is a challenge to combine locally-

sourced materials with new technology for building projects. Intelligent decision-making, capacity and knowledge deliver sustainable solutions. The economic and environmental aspects of a building conflict with each other, thus designs must ensure that they don't impact the planet. Sustainable buildings are resource-efficient with a low operation cost make the projects sustainable with alternative building materials, natural lighting, low-VOC paint and recycling construction waste.”



padal residence, kakinada | studio inscape, hyderabad



stonex, kishangarh | urbanscape architects, new delhi

stone house,spain | nomo studio, spain



photography : joan guillamat

a house in a gaathan, dakivali | untag architecture and interiors, mumbai



photography : untag architecture & interiors

outlook for the future

Now that the importance of sustainable architecture is well-known, how will it fare in the future? Ar. Anna Heringer says, “We must accept that death is a part of life, which will remove the need to add steel, cement and cladding to combat the vulnerabilities of natural building materials. The governments must bring carbon taxes and make sustainable materials cheaper than conventional ones.”

Ar. Rahul Kadri agrees, “Sustainable neighborhoods – a self-sustaining unit with locally-available public facilities and amenities – could reduce travel time, carbon emissions and pollution. They ensure the optimization of resources and services, reduce wastage and ensure efficient costing.”

Pointing to the importance of government intervention and ownership of the problem, Ar. Amarnath Duleep says, “The government must

implement climate policy, decision-making and legislation regarding sustainability as there have been several conversations around this. Once considered a radical topic, sustainability now influences public discourse in every discipline: technology, economics, philosophy, architecture and design – and we seek solutions. Therefore, researchers and policymakers must develop sustainable building and city designs. A multidisciplinary collaboration of architects and planners with socio-political participation, technological innovation, public education and government leadership shall bring a change.”

Architects Gauri Satam and Tejesh Patil, sum up saying, “Sustainability is a lifestyle about conscious decision-making, recycling and upcycling what we have consumed. It is not limited to architecture, but about incorporating productive landscapes by creating local-food cycles, native diversity and creating a worldwide awareness of ‘Less is More’.” 卍