India has traditions to keep, and traditions to let go. Ceiling fans, for example, which originated nearly 300 years ago as cloth-covered frames called *punkah*, are a tradition to keep. Clay bricks, on the other hand, which date back to the ancient civilisation of the Indus Valley, are a tradition to leave behind.

Unfortunately the opposite is happening. The sale of air-conditioning units jumps 20 percent annually, with upwardly mobile Mumbai estimated to have the same potential cooling demand as a quarter of the United States. The brick industry relies on nearly 100,000 coal-fired furnaces. The intensity of India’s resource usage increases as the population grows. By 2050, India will be home to 1.6 billion people, overtaking China as the world’s most populous nation. Most of this growth will flow to the cities, where the residential stock will double. This rapid expansion in construction creates a window of opportunity for a new kind of urban dwelling—one that is less resource intensive yet meets the aspirations of today’s growing middle class.

Rethinking India’s urban dwelling will require more than the creativity of architects. A dynamic effort must transform the market by drawing together developers, banks, manufacturers, and occupants. Only then will Green technologies and materials become mainstream and help reduce environmental impacts.

**A NEW VISION FOR THE URBAN DWELLING**

The quintessential Indian home was built to be socially relevant and responsive to seasonal variations. Set in a rural environment, the single-story structure was narrow in shape, well-ventilated and protected from the sun, with an inner courtyard. While this worked in the past, we need a new vision for tomorrow’s more cosmopolitan future.

Cities offer a denser lifestyle with homes surrounded by urban heat islands with dust, noise, and pollution. The design of simple, low-energy strategies and better building materials can shelter from the outside world, creating havens of comfort for occupants of all income levels. This defies assumptions that Green design belongs only to the affluent.

**INDIA CAN KEEP ITS COOL**

Despite India’s tradition of frugality, rising incomes have been shown to correlate to higher energy demand. The design of today’s homes needs to mirror the aspirations of those who reside there, but smart choices can prevent mistakes.

The building should be designed at the outset with such concepts and solutions as building orientation, natural ventilation, and thermal glass in mind. If air conditioning is still required, an efficient system (3-star or better) should be installed, which can drop the cooling load by 50 to 60 percent. The most risky scenario is to construct poorly designed homes that result in self-installation of inefficient air-conditioning units.

Architects such as Ashok B. Lall are going a step further through simple integration of cooling design within the structure. He allows air to pass through horizontal and vertical ducts in the floors and walls, offering occupants adjustable shading to respond to external conditions. He also provides monitoring devices to warn occupants of excessive consumption.

**BUILT LIKE A BRICK**

India has a rapacious appetite for clay bricks. More than 15 million tonnes of coal are used in the production of 140 billion bricks annually, resulting in 40 million tonnes of CO₂. By switching to a more sustainable material, 70 percent of carbon emissions can be prevented.

A pioneer in this field is Kanchipuram-based Gandhi Gopalakrishnan, who converts rice husk ash (RHA) into eco-friendly bricks, reducing the requisite amount of cement. By encouraging adoption of RHA bricks, Gopalakrishnan promotes a viable alternative to burnt bricks.

Architect Chitra Vishwanath has mainstreamed...
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Compressed mud blocks in her home city of Bangalore, building hundreds of homes for middle-class families. The earth required for each home is excavated on-site, creating a naturally cool basement that allows an indoor escape on the hottest days.

While RHA and compressed earth blocks do not yet benefit from a supply chain for mass distribution, there is access in most Indian states to fly ash blocks, aerated autoclaved concrete blocks and hollow concrete blocks.

SENSIBLE SOLAR SOLUTIONS

As affluence rises more Indians are foregoing the bucket bath in favour of hot showers. Because sun is abundant everywhere in India, 100 percent of a home’s hot water demand can be met by the installation of solar hot water collectors.

Given the rising cost of electricity, India’s plentiful sunlight, and frequent power cuts, solar power is an excellent way to meet a home’s entire energy demand. Solar photovoltaics can also ease the reliance on energy storage systems and backup diesel generators that middle- and high-income residential owners depend on when power outages occur.

Demonstrating what can be accomplished, Gujarat province in India is on its way to making its capital, Gandhinagar, a solar-powered city. As a first step, the International Finance Corporation (IFC) invested in the installation of two clusters of 2.5 MW of solar capacity on residential rooftops of the city, which has more than 300 sunny days each year. The project benefits 10,000 people and avoids 7,000 metric tonnes of CO2 annually.

DEVELOPERS TAKE THE INITIATIVE

Some forward-thinking property developers recognise that corporate sustainability is a brand advantage. Value Budget Housing Corporation (VBHC) recently won the Best Green Building Project prize at India’s 12th National Convention of Architects. It has plans to build Green residences across India.

THE IMPORTANT ROLE OF FINANCIAL INSTITUTIONS

Even when developers are on board, the active engagement of financial institutions is essential for much needed capital. In addition to providing Green construction finance, banks can offer Green mortgages, which allow homeowners to purchase Green homes by qualifying for larger loans due to lower utility costs. Studies have shown that Green mortgages attract responsible homeowners who default less often.

Since the mortgage industry is still new to India, an opportunity exists for banks to offer direct to a more beneficial lending product. The prestigious financial institution Kreditanstalt für Wiederaufbau (KfW), a leader in Green mortgage financing in Germany, has started to expand its success in India.

Reduced window-to-wall ratio, energy-efficient ceiling fans, solar hot water collectors, and shading devices. VBHC is also mindful of water scarcity, including such solutions as recycled water for flushing and low-flow showerheads and faucets.

VBHC has a lean manufacturing process that emphasises form construction without compromising Green principles. The company, which also favours rooftop cultivation and open spaces for community building activities, has plans to build Green residences across India.

IT IS NOT TOO LATE

In this moment of change, it is important to recognize the opportunity to influence design and growth plans. With its abundant insight and creativity, India can forgo what Mumbai architect Rahul Mehrotra calls “the architecture of impatient growth”. Even in the mass manufacturing of homes, voluntary standards provide a powerful difference can be made when developers participate, financial institutions are engaged, and voluntary standards provide assurance, all within the context of comfortable and convenient modern design. It is not too late to bring change home.

A powerful difference can be made when developers participate, financial institutions are engaged, and voluntary standards provide assurance, all within the context of comfortable and convenient modern design. It is not too late to bring change home.

4 Data of energy use by EDGE software 6 Rendering by Ashok Lall who incorporates a disciplined approach to cooling design. 8 Ramesh Puranik House in Bangalore by Chitra Vishwanath of Biome Environmental Solutions: breeze using earth from the site for construction and being passively cooled, the house also captures rainwater to fully meet the users’ potable water needs. The water from the driveway is recycled for flushing toilets. 7 The International Finance Corporation (IFC) invested in the installation of two clusters of 2.5 MW of solar capacity on the residential rooftop of Gandhinagar.

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Photo by Chitra Vishwanath