

01 SUSTAINABLE BUILDINGS: A REALTY CHECK

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A REALTY CHECK



Why green buildings?

The rapid growth of cities has led to a desperate clamour for more residential, office, commercial and retail spaces. India has plunged into a frenzy of construction as a result. If anyone thinks cities are already built to the brim, be warned: more than 70 per cent of the buildings — our homes, offices, and shops — that will stand in India in 2030 are yet to be built. The trends in the West are exactly opposite — for instance, about 80 per cent of the building stock that will stand in the United Kingdom in 2050 has already been built.

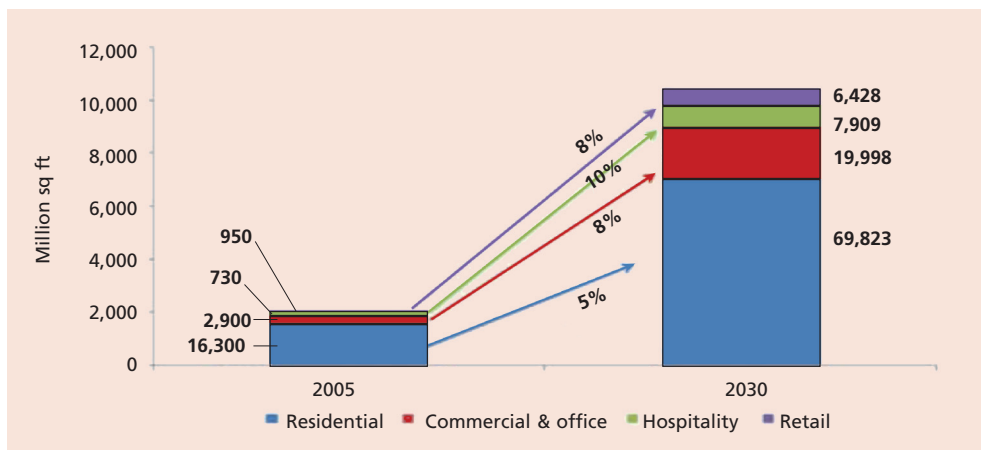
In India, what is worrying is the scale of the change: with changing lifestyles, cities will use up more and more of precious water and energy and generate massive amounts of waste. So far, due to the high incidence of urban poverty and traditionally frugal lifestyle habits, India has had a large stock of low-energy urban homes. But this will change. A 2010 study on urban infrastructure by the global consultancy firm McKinsey estimates that the middle class will be the most dominant income class in future: it will account for 50 per cent of all urban households by 2025. Bullish buying power and changing lifestyles will redefine the code of comfort and unleash massive consumption-based resource guzzling in cities.

Fuzzy numbers

There is no official database on the actual trends in the building construction sector in India. The ministry of housing and poverty alleviation (MoHPA) tracks the demand for housing units, but not in the other built-up areas. The Planning Commission and other concerned departments assess the trends in the overall construction sector. But this industry includes all infrastructure-related construction as well — industry, mining, roads and highways, power, irrigation, etc; buildings are just a part of it. Though data of all those who have applied for approvals for building projects is available, it is not centrally compiled in a composite data bank.

In the absence of official data, one has to depend on estimates available from sources like real estate service providers, investment banks and research foundations. Some of these sources are the Green Building Council, the Confederation of Real Estate Developers Associations of India (CREDAI) etc. According to the Environmental Design Solutions Pvt Ltd (EDS), a New Delhi-based consultancy, the overall constructed area in 2005 has been estimated to be close to 21 billion square feet, which is a mere 20 per cent of the approximately 104 billion square feet that will be built by 2030 (*see Graph: Explosive increase in built-up area*).

Graph: Explosive increase in built-up area



Source: Environmental Design Solutions Pvt Ltd



What else do the numbers tell us?

- **Construction hotspots:** The big cities — Bengaluru, National Capital Region of Delhi (NCR), Mumbai, Chennai, Hyderabad, Kolkata and Pune — are the destination points for real estate. In these mega cities, the commercial space will expand significantly. The states that have recorded the maximum urbanisation rate of 50-30 per cent (Maharashtra, Delhi-NCR, Tamil Nadu and Gujarat), have also recorded the highest number of projects.
- **Town building mania:** It is not only the organic growth of cities, but also the creation of new towns in greenfield areas that will add to the construction boom. IDFC's *India Infrastructure Report 2009* indicates the scale of this change. Private 'integrated' townships covering an area over 100 to over 1000 acres each and more than 200 townships covering more than 200,000 acres are under approval for planning and construction especially around the four metros. On Delhi Mumbai Industrial Corridor several private towns and cities are on the cards. Similar trend is noticed along highways like the Delhi-Jaipur corridor, or around Kolkata among others. These new towns are sprouting without clear green benchmark, implementation strategy or strong regulatory safeguards.

As the core area of older town and mega cities are saturated, it is estimated that more than half to 95 per cent of the new buildings will come up in resource stressed suburbs and new townships. These townships are massive investment magnets. The real estate consultancy and research firm, Jones Lang LaSalle (JLL) reports that the international investors since 2006 have put in about US\$ 15.8 billion in this sector. Of which, US\$ 2.7 billion went to residential projects and US\$ 2.4 billion to township projects, which is the second highest investment amongst all types of projects. The rest have gone into commercial, SEZ projects etc. Some states like Maharashtra are encouraging such towns with sops to developers including bypassing the urban land ceiling restrictions, non-agriculture tax conditional to the provision of 10 per cent affordable houses in these projects, automatic non-agricultural permission, concession in stamp duty and development charges and a floating FSI, provision of land by the state government for a contiguous project. Without proper regulations such developments can lead to enormous resource lock up and wastage.

- **Clamour for homes:** In this prolific construction of homes, offices, and retail, the residential units will dominate the trend to reduce the deficit of 26 million residential units estimated by the Planning Commission. Under the National Housing and Habitat Policy 1998 and 2006 the government is expected to build 2 million dwelling units a year. Under the Jawaharlal Nehru Urban Renewal Mission (JNNURM) a much smaller target one million units were to be built during the eleventh five year plan, which is only 1 per cent of the housing shortage. This sector will make enormous demand on resources due to sure numbers and lifestyle impacts.
- **Home for poor:** Housing for the poor people will dominate the policy of the government. Urban poverty in India remains high. About 75 per cent of the urban poor is in the bottom rung of income level. This will escalate demand for low cost housing — from 25 million housing units in 2007 to 38 million affordable housing units by 2030, as per the Mackenzie's estimates of 2010. Even though poor households are not resource guzzlers there is enormous potential for innovative housing design to make these new housing units more comfortable for the poor people with in built resource efficiency, community facilities and thermal comfort feature. The government will have to shoulder this responsibility.
- **Commercial buildings:** The commercial buildings — hospitality, offices and retail, show high growth rate. McKinsey estimates that from the built-up area of one billion square metre in 2009, commercial spaces will grow to four billion square metre in 2030 — four-fold increase. Hospitality and Retail, which have had a relatively overall smaller constructed area so far, shall achieve higher compounded annual growth rate (CAGR) in the range of 8-10 percent and by 2030, they will be 7 to 11 times of what they were in 2005. BEE estimates that the office stock would need to increase by nearly 20 million square feet a year in New Delhi, Mumbai, Bengaluru to keep pace with demand.

Overall thus, the projected demand by usage in real estate sector shows varying trends. Amongst the built up spaces by usage the demand for residential space dominates the demand at 63 per cent. The aggregate share of office and retail is comparatively smaller than the residential sector. The growth rate will be very high in the commercial component. But



this component will also influence the resource consumption most. It has been noted in the US that with increase in commercial spaces energy intensity increased from an average 310 kWh/m²/yr in 1995 to an average of 351 kWh/m²/yr in 2003 — 15 per cent increase — mainly due to higher levels of lighting and equipment used in commercial spaces.

- **Retail frenzy:** High end retail will influence the construction sector considerably. According to the real estate consultant Cushman & Wakefield India is ranked number two in Global Retail Development Index 2008. This indicates that the high end construction activities are expected to escalate in India. The share of organised retail valued at US \$30 billion in 2010, as per the estimates of Ernst & Young, will gain in prominence. NCR will hog 20 per cent of the future demand and Mumbai about 16 per cent. In 15 largest cities of India, space for shopping malls of 79 million square feet in 257 centers is expected to come up. Malls without a leash can maul the cities.

Cushman & Wakefield has projected that almost 80 percent of the projected demand will be in 7 major cities in India that include National Capital Region of Delhi, Bangalore, Mumbai, Pune, Hyderabad, Chennai, and Kolkata. The National Capital Region of Delhi (NCR) will lead the pack followed by Bangalore and other major cities. NCR will witness such gregarious growth largely because of the emergence of the business districts like Gurgaon, NOIDA and concentration of corporate firms. Pune is expected to be the third fastest growing city and Mumbai fourth. Besides other cities like Jaipur, Ahmedabad, Kochi and Goa too add a significant share of demand due to the governments' initiatives to promote tourism in these cities

- **Who will build?:** So far in the residential sector the government has been the key provider of housing for different income groups — economically weaker section (EWS); low income group (LIG), high income group (HIG). Many states governments have focused on providing housing for all these income categories. But in the future the government will concentrate more on EWS and LIG, the lower income groups.

The role of the private players will grow in the commercial building sector that includes hospitality, offices, and retail and also high income residential sector. For example, the CREDAI is the association of the private builders and developers with 3000 strong

membership who are responsible for 80 per cent of the real estate development in key 13 states of India. These players will largely determine the technology and architectural pathways of the middle income and high income houses and commercial establishments. This will demand linking of resource efficiency with the corporate social responsibility and strong regulatory supervision.

Green worries

The construction boom can be a bane. Where and how buildings are built and used decide their damaging impacts. The lifestyle of the building occupier, the aspired comfort level, architecture and the location, and material used for construction impact on use of energy, water, land, bio diversity, air, waste and traffic. Cities face the challenge of providing higher levels of comforts to people in resource efficient ways.

In India buildings are responsible for 40 percent of the energy use, 30 percent of the raw material use, 20 percent of water use, and 20 percent of landuse. At the same time it causes 40 percent of the carbon emissions, 30 percent of solid waste generation, and 20 percent of the water effluents (See graph 3A: Burden of built environment and 3 B: Share of built environment in pollution emission)

Policy push

State of green building policies: The regulatory challenge is to set the terms of building construction and design as well as urban design and building operations to prevent lock in of high resource intensity. Two set of regulations have bearing on resource efficiency — those directed at the building construction and design and those that influence lifestyle choices and behaviour of users. Slowly, regulations are taking shape in India to ensure that buildings are constructed to, at least, lower the threshold level of water and energy requirements and minimise waste while improving comfort level.

The most focused of all resource related to building regulations are those related to energy efficiency. Integrated Energy Policy 2006 had sought the changes in national building code to facilitate energy efficient buildings; compulsory energy audits; solar water heaters; among other energy-saving approaches. Soon after the Energy Conservation Building Code (ECBC) came in 2007 to set the minimum energy performance standards for new commercial buildings with connected load of initially 500 KW and subsequently lowered to 100 KW and above. It also provided for retrofitting of existing buildings. This is still voluntary.



Only Rajasthan and Odisha have notified ECBC. Kerala and Uttarakhand, are about to do it.

According to the BEE, ECBC can bring about 30-50 per cent improvement in energy efficiency. BEE estimates that energy used per unit area per year of conventional buildings is about 180-200 kwh/sqm/year or higher and with ECBC that sets the minimum standards, it can be cut to 140-110 kwh/sqm/year.

The BEE has also introduced voluntary star labeling programme for day-use office buildings, BPOs and shopping complexes. About 123 buildings have been awarded energy star ratings label so far. ECBC is the minimum standards equivalent to one star. But with incentives, builders can target higher ranks to maximise energy savings.

With design innovation it is possible to go much beyond the minimum standard of ECBC. In fact, buildings exist today that consume half the energy permitted by the code. For example, Bayer Eco Commercial Building in Noida consumes around 75 kWh/sq m/year. The upcoming building of the ministry of environment and forests in Delhi is targeting less than 50 units per sq m per year.

Policies on water efficiency and water conservation, and waste have evolved more as part of the water conservation and waste management policies in cities rather than as green building policies. But these policies including that of rainwater harvesting, decentralized wastewater treatment, segregation of waste have strong bearing on water and resources

efficiency in buildings and building design. Many of these requirements are now linked with the environmental clearance process for the large buildings and townships.

The environmental impact assessment of buildings has evolved as a mandatory measure for large buildings with more than 20,000 sq meter of area. This is the only legal instrument that requires holistic assessment of all types of resource use and efficiency measures in buildings. This is also legally binding as it is enforced under the Environment Protection Act. But this tool is not well designed and is extremely vulnerable to corruption. It is now being questioned whether this practice should be discontinued and be replaced with a system linked with the overall building design clearance and completion certification process of the urban local bodies in cities for single window clearance but harmonized with the requisite benchmarks for energy, and water efficiency waste minimization benchmarks.

Most of the emerging green building policies are not well harmonised for integrated application. On ground implementation still remains a serious challenge as green building being fairly a new area of governance has not created adequate administrative, technical, and scientific skills, Regulatory preparedness and institutional mechanism for effective implementation are still very poor. For instance, the state governments are still floundering over the mandatory implementation of the ECBC at the city level. The administrative and the building approval system are still not geared to carry out compliance assessment and post construction monitoring.