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India, like many other developing countries, is going through a building boom, which is the result of expanding population, growing urbanization and a significant increase in incomes and wealth. Buildings are now being constructed for a large range of purposes which include homes for all sections of society, commercial complexes and shopping malls, hospitals, schools and government offices at every level of administration. As it happens, buildings have an economic life which runs into several decades, and in the past, structures were constructed to last for centuries. The design and pattern of construction of a building determines its use of energy, water and a whole range of other resources. Consequently, given the long life of a building, which is for instance, inefficient in the use of energy, a society can get locked into a pattern which allows for little change during the life of the building.

TERI has been at the forefront of devising solutions by which buildings in this country, and now in other countries as well, can be designed and constructed in a way that ensures efficiency of use of energy, water and other resources. TERI’s work also includes a whole range of environmental and social criteria by which buildings can reduce their harmful footprint on society. However, change in the building sector would require the involvement of a large number of stakeholders including architects, builders and most importantly the public at large which would use buildings throughout their lives. The most important stakeholder and motivator of change in the direction of greenness of buildings would be banks and financial institutions. If the financier of a building desires features which are green, then that clearly would be the most dominant influence in bringing about change in the right direction. To that extent YES BANK, which has been a leader in several social initiatives and actions, has joined hands with TERI to carry out the YES BANK TERI-BCSD Green Real Estate Survey. TERI-BCSD is a pioneering initiative launched by TERI to create a grouping of enlightened corporate organizations which are dedicated to the practice of sustainability in all their operations. It is, therefore, particularly fitting that a knowledge organization like TERI, which is at the core of TERI-BCSD’s activities and operations, has partnered with YES BANK in this initiative. The purpose of this partnership would be to demonstrate what corporate including a leading financial institution like YES BANK can do on the basis of knowledge that is the core of change being contemplated and implemented by the members of TERI-BCSD.

It has been very satisfying for TERI-BCSD to be in this partnership, and we hope this is one of many such collaborative ventures that would be taken in hand in the future, involving corporate organizations which are inspired by the example of YES BANK.

R.K. Pachauri
Director-General, TERI
I am pleased to share YES BANK’s latest Knowledge Report on Green Real Estate Sector in India. Through a comprehensive survey, inputs on identifying and addressing key challenges that the industry faces, were drawn from major stakeholders of the sustainable real estate in India.

Sustainability as a strategy is being mainstreamed widely across corporate India to ensure steady yet responsible growth. India’s real estate sector has witnessed tremendous growth over the last few years, and as per CRISIL, the sector is expected to increase at a CAGR of 14 per cent in the short term and 19 per cent over the next couple of years. Given this growth estimation, holistic sustainability of buildings that is economic, environmental and social aspects are of an urgent concern. The green real estate industry consists of unique stakeholders, each with their own diverse views on the sector’s growth. It is therefore important to bring about a consensus to create a win-win that addresses sector concerns along with an alignment towards a holistic triple bottom line.

This report pertinently brings out perspectives on the challenges, gaps and key drivers for the green real estate sector and what it would take to mainstream sustainability given that it is estimated to command more than 6.3% share in India’s GDP. Lack of awareness among stakeholders on benefits of green buildings, unavailability of preferential lending rates for small-medium sized real estate developers, high cost, relatively lower returns and longer payback are biggest deterrents to this sector. The study recommends significant changes to overcome these barriers and highlights the urgent need for all stakeholders like Real Estate Developers, Financial Institutions, Real Estate Fund Managers, Green Building and Landscape Architects Companies, Energy Service Company (ESCo), Construction Material Manufacturers and large pro sustainability conglomerates to come together to build and increase awareness on the tangible and intangible benefits of green buildings. While knowledge reports, webinars and other awareness tools exist, effective use of conventional and social media may lead to higher penetration and capacity building. Ensuring stricter enforcement regulations and policies on mandatory green certification of all future real estate projects is a pressing requirement that the Government needs to look at. Further, introducing innovative financial products for green real estate would provide impetus for growth. These measures represent small but significant steps towards bringing about a transformational change in promoting sustainable building space.

I hope that this study, based on multi-stakeholder responses and feedback, would help the green real estate players to align their business goals along the broader sustainability parameters, thus shaping India’s strategic mission under the aegis of NAPCC to promote sustainable habitat in the years to come.

Thank You.
Sincerely,

Rana Kapoor
Managing Director & CEO
With depletion of natural resources, there is a huge amount of pressure on countries to look at its resource consumption patterns. Particularly sectors like construction are extensive users of energy, water, wood and transportation. It is therefore becoming imperative for the sector to take measures today, to safeguard natural resources for tomorrow. This of course is challenging given that the sector has to maintain a fine balance between reducing the use of natural resources, cost, and maintaining a high quality of construction.

Though the Indian real estate sector has been sluggish, the overall growth has been rapid in 2013. India has seen fast urbanization of rural areas and addition of more buildings to the urban environment that is currently under infrastructural duress. From an ecological footprint stand point, buildings are a complex ecosystem that contribute extensively towards sustainability imbalance. They consume resources and generate significant quantum of waste. According to Centre for Science & Environment, buildings consume 40% of energy; 30% of raw materials; 20% of water; and 20% of land used up by cities. In addition to this, buildings can be responsible for up to 40% of carbon emissions; 30% of solid waste generation; and 20% of water effluents discharged in our cities.

It has been estimated that approximately 32% of total electricity consumed in India is by residential and commercial buildings. Very little of the waste generated by construction or demolition is recycled or reclaimed for reuse. While construction processes are increasingly adopting environmental improvement, waste minimization practices and resource inputs are getting less attention. Further, India doesn’t have robust regulations on energy consumed by buildings. The Energy Conservation Building Code (ECBC) introduced in 2007 aimed at maximizing energy and resource efficiency of commercial buildings on voluntary basis, but it did not include residential buildings, which account for 75% of the total electricity consumption.

In short, the Indian real estate activity has a significant impact on environment and resources. Therefore, increasing energy efficiency, waste reduction and recycling are no longer just options for sector, but a burning need. Green Building assume significance here. It uses less water, energy and natural resources than a conventional building. It also generates less waste and provides a healthy living environment for its occupants. Thus developing more and more green buildings in the country may be a solution however it poses multiple challenges towards being “Green”.

In spite of hurdles, in the recent years, the green building movement has undoubtedly picked up in India. Large developers today are consciously looking at the entire supply chain right at the design stage. But this can be challenging on account of sourcing sustainable material, relevant solutions towards energy modeling and resource reuse, unavailability of sustainable technologies and vendors. One of the key objectives of the National mission on sustainable habitat released by the Indian Prime Minister in 2008 was to extend the energy conservation building code to new and large buildings to ensure energy efficiency in a significant way. However, even after six years of its release, the uptake of sustainability principles is slow in the real estate
sector. There lie an array of challenges and barriers ailing the green real estate sector in India, which get further amplified since its value chain presents different and conflicting views on the sector’s revival.

The objective of this study is to bridge this gap and to bring out insights that would help fuel sustainable growth in the Green Real Estate sector. The report is intended for all stakeholders of the sector to understand a holistic picture, followed by practical recommendations. This survey covers top and senior management professionals spread across the entire Green Real Estate value chain in India. The research reveals startling figures. 72% of respondents believe that the high costs of green real estate buildings are major impediment to the growth of this sector. Close to 50% of the same set of respondents also believe that the high cost incurred on green buildings is just a notion and that the cost is equivalent to that of normal buildings. This highlights that here is an acute lack of understanding among stakeholders about benefits of green buildings.

The study further identifies key enablers that drive the sector’s growth in India today. These include enhanced brand value and reputation of the company, financial incentives from regulators, municipal bodies and growing international trend to invest and reside in green buildings. However, the drivers act for energy conscious investors and constructors only, thus leaving a large part of real estate stakeholders untouched by the sustainability principles.

In our recommendations we have brought out the pertinent need to increase stakeholder awareness on holistic benefits of green buildings. It further covers that stricter enforcement of existing regulation is the need of the hour, along-with a national level policy on all future commercial real estate projects. Although the survey reveals that inclusion of green real estate sector in the Priority Sector Lending (PSL) for banks would help, it is for the Reserve Bank of India to consider mandating this, depending on the various other parameters. Preferential lending and introduction of innovative credit lines for such projects are one of the steps that the financial sector may consider.

We hope that the survey findings and the case studies highlighted in the report act as a trigger to ensure that sustainable real estate becomes a commonplace phenomenon in the times to come.

Sincerely,

Namita Vikas
Senior President and Chief Sustainability officer – YES BANK

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Survey – Background & Methodology
Green real estate is a niche sector in India, with few corporate houses and developers leading the way. The sector seeks leadership by corporate houses, regulators and developers in ensuring implementation of policies aimed specifically at ensuring long term sustainability of the real estate. After a much felt need, we decided to survey stakeholders across the green real estate value chain that includes developers, investors, green building architects and consultancies, customers and regulators for assessing what is ailing the growth of the sector and how it can be addressed. The first edition of this survey is aimed at real estate business leaders, large sustainably driven companies, financial institutions, real estate investors and fund managers, regulators, policy makers and green building professionals.

In compiling this study, responses have been collected through a comprehensive online survey and one-on-one interactions with the sector’s leading experts. The survey respondents were from varied strata including real estate developers, green building designers, landscape architects, real estate fund managers, financial institutions like banks and Development Financial Institutions (DFIs), Non Banking Financial Companies (NBFCs), material suppliers (such as specialty chemicals, cement, glass, lighting and HVAC (Heating Ventilation and Air Conditioning)) and other corporate houses. Top management from these organizations formed 30% of the total set of respondents of this survey, while 26% of the respondents were from senior management level. Middle management formed a robust 30% of the total respondents. Inputs from 700 experts and 150 completed survey responses and interactions were considered for drawing insights and recommendations for this study. This holistic mix of participants makes it a unique study, representing a broad spectrum of perspectives, thus presenting an all-inclusive view of the sector to the reader. The Figure 1 below gives the sector wise split of the survey participants.
This study aims to present a comprehensive, 360° view of multi-stakeholder perspectives on the state of green real estate in India, to gauge the drivers and barriers to the sector. The paper concludes with recommendations, which would aid in overall positive growth of the sector in India.
Chapter 1: Introduction to Green Real Estate
Introduction to Green Real Estate

What is a Green Building?

A green building is one that depletes the natural resources to a minimum during its construction and operation. The aim of a green building design is to minimize the demand on non-renewable resources, maximize the utilization efficiency of these resources when in use, and maximize the reuse, recycling, and utilization of renewable resources. It maximizes the use of efficient building materials and construction practices; optimizes the use of on-site sources and sinks by bioclimatic architectural practices; uses minimum energy to power itself; uses efficient equipment to meet its lighting, air conditioning, and other needs; maximizes the use of renewable sources of energy; uses efficient waste and water management practices; and provides comfortable and hygienic indoor working conditions (Philander, 2012)(GRIHA Manual 2005).

Green buildings are designed with occupancy comfort as a priority. Indoor environmental quality is achieved by appropriate ventilation and day lighting at the same time ensuring demand side optimization of electricity use. In addition, indoor material selection seeks to eliminate the use of adhesives, finishes and fittings that emit chemical contaminants (such as formaldehydes and volatile organic compounds) which are harmful to human health and can contribute to sick building syndrome.

Green buildings are proven to use fewer materials and to consume up to 60 percent less energy and freshwater than a conventional building and; therefore, generate less waste. This is achieved by design efficiencies, installation of energy and water-efficient appliances and fittings and the use of green technologies e.g. solar power, rainwater and grey water harvesting and high-performance building materials.
Green Building Rating Systems

While various policies and statues direct the construction sector to incorporate resource efficiency and thereby reduce the detrimental impact of construction activities on the environment, rating and certification schemes play an important role in measuring and quantifying environmental performance of a given building; and at the same time ensure a synchronized approach and implementation of resource efficient in the built environment. Some of the notable green building ratings systems are:

- Green Rating for Integrated Habitat Assessment (GRIHA)
- Leadership in Energy and Environment Design (LEED)
- Indian Green Building Council (IGBC) Green Homes
- Eco Housing
- BEE Star labeling for office buildings
Green Rating for Integrated Habitat Assessment (GRIHA): GRIHA is a rating tool that helps assess the performance of a building against certain nationally acceptable benchmarks. It evaluates the environmental performance of a building holistically over its entire life cycle, thereby providing a definitive standard for what constitutes a ‘green building’. The rating system, based on accepted energy and environmental principles, has been adopted by the Ministry of New and Renewable Energy (MNRE) in 2008 as the national rating system, where The Energy and Resources Institute (TERI) and MNRE have been working together in promoting green buildings.

GRIHA, by its qualitative and quantitative assessment criteria, is able to ‘rate’ a building on the degree of its ‘greenness’ (Vilas Javdekar Developers). The system has been developed to help ‘design and evaluate’ new buildings (buildings that are still at the inception stages). A building is assessed based on its predicted performance over its entire life cycle – inception through operation. The stages of the life cycle that have been identified for evaluation are:

1. **Pre-construction stage**: (intra- and inter-site issues like proximity to public transport, type of soil, kind of land, where the property is located, the flora and fauna on the land before construction activity starts, the natural landscape and land features).

2. **Building planning and construction stages**: (issues of resource conservation and reduction in resource demand, resource utilization efficiency, resource recovery and reuse, and provisions for occupant health and well-being). The prime resources that are considered in this section are land, water, energy, air, and green cover.

3. **Building operation and maintenance stage**: (issues of operation and maintenance of building systems and processes, monitoring and recording of energy consumption, and occupant health and well-being, and also issues that affect the global and local environment) (devrealestateconsultant.com, 2012) (grihaindia.org)

**Leadership in Energy and Environment Design (LEED):** The Indian Green Business Center (IGBC), under the Confederation of Indian
industries (CII) is facilitating the LEED rating of the United States Green Building Council (USGBC). Introduction of the LEED Rating system has stimulated innovation within the building materials supply industry. High albedo roofing materials, high performance glass, waterless urinals, fly ash bricks for walls, roof insulation materials, high CoP (Coefficient of Performance) chillers and energy simulation services are now being made available in the market. The IGBC has launched LEED India for Existing Buildings (EB), New Construction (NC), Core and Shell (C&S) and Indian Green Building Council (IGBC) Green Homes, which represent the measurable indicators for global and local concerns in the Indian scenario. Based on the points achieved, the building may be eligible for LEED certified, Silver, Gold or Platinum Rating, where the weighting of criteria reflects Indian environmental priorities.

**Indian Green Building Council (IGBC) Green Homes:** Indian Green Building Council (IGBC) Green Homes is the first rating programme developed in India, exclusively for the residential sector. It is based on accepted energy and environmental principles and strikes a balance between known established practices and emerging concepts. The system is designed to be comprehensive in scope, yet simple in operation. This system is a measurement system designed for rating new residential buildings which include construction categories such as individual homes, high rise residential apartments, gated communities, row houses and existing residential buildings which retrofit and redesigned in accordance with the rating criteria (IGBC, 2013).

**Eco Housing:** The Eco-housing partnership was launched in September 2004 in response to the unchecked and resource intensive housing construction boom in India. It was being implemented by the International Institute for Energy Conservation (IIEC) with support from United States Agency for International Development (USAID) and the Global Development Alliance (GDA). The initiative aims to address the challenge of resource consumption of housing projects. The program has been characterized by specific interventions, including the development of Eco-housing performance assessment tool, integration of Eco-housing policy and fiscal incentives, demonstration projects, capacity building and the development of a sustainable institutional mechanism to mainstream Eco-housing practices.

Pune was chosen as the champion city to launch Phase I (2004-2006) of the Eco-housing program as it represents one of the most rapidly
expanding cities in western India. Program implementation in Pune was in partnership with stakeholders including the urban local body; Pune Municipal Corporation (PMC), leading developers, architects, housing finance institutions and technology providers. Phase II of the program (2006 onwards) has focused on capacity building and geographic expansion of the programme addressing the five climatic zones of the country. The Eco-housing Assessment Criteria Version II and the National Certification Mechanism for Eco-housing form the backbone of this program (EcoHousingIndia, 2013).

**Scheme for Star Rating of Office Buildings:** To accelerate energy efficiency activities in existing commercial buildings, the Bureau of Energy Efficiency (BEE) has developed a star rating programme for buildings based on actual performance in terms of specific energy usage (in kWh/m²/year). The buildings are rated based on assessment of electricity bills against the benchmarks established for each building typology in different climatic zones.

**Indian Policy Scenario in the Built Environment**

**Energy Conservation Building Code (ECBC):** The Energy Conservation Act (2001) led to the formation of the Bureau of Energy Efficiency (BEE) that started the formulation of the ECBC in 2007. The ECBC aims to reduce baseline energy consumption by setting minimum energy performance standards for new commercial buildings, including for building envelopes, mechanical systems and equipment, including heating, ventilation and air conditioning (HVAC) systems, interior and exterior lighting system, service hot water, electrical power and motors.

State governments have the flexibility to modify ECBC to suit local or regional needs, where GRIHA (Green Rating for Integrated Habitat Assessment) has been adopted as a tool to ensure implementation of the same across different parts of the country. The plinth area rates of Central Public Works Department (CPWD) have been revised to incorporate energy efficiency through the GRIHA framework that mandates compliance with the ECBC.
Environmental Clearance of Building Projects: Environmental Impact Assessment (EIA), which is mandatory for all projects over 20,000 square metres of built up area, requires information on ECBC-compliance submitted for evaluation to relevant authorities as per specific State government requirements. A questionnaire-based qualitative examination to ascertain compliance with the ECBC is conducted before awarding environmental clearance for construction of any proposed project.

Further, fast track environmental clearance has been linked to pre-certification with GRIHA and LEED/IGBC rating systems (which incorporate compliance with ECBC), thereby further strengthening incorporation of energy efficiency in the built environment.

National Mission on Sustainable Habitat (NMSH): The Prime Minister’s Council on Climate Change released India’s National Action Plan on Climate Change (NAPCC) on 30 June 2008. To promote resource optimization in the built environment, the NMSH emphasizes on the extension and incorporation of ECBC into municipal bylaws, management of solid waste and promotion of urban public transport.

Standards and Labelling Scheme: The BEE has several programmes that lay down minimum energy performance standards for high-energy end-use equipment and appliances. Each appliance is ranked on a scale of five stars, with more stars indicating higher efficiency and more power savings. The labels provide information about the energy consumption of an appliance, and thus enable consumers to make informed decisions (DFID India). The efficiency bandwidths used to determine Star Labelling for an appliance are revised periodically, and are currently defined for appliances in a mandatory phase up to 2015.

Some of the notable green buildings in India include TERI’s RETREAT complex at Gual Pahari, Gurgaon, CII - Sohrabji Godrej Green Business Center in Hyderabad, ITC Green Center in Gurgaon, Wipro Technologies in Gurgaon, ITC Gardenia in Bangalore and ITC Grand Chola in Chennai, Fortis Memorial Research Institute, Gurgaon.
The green real estate ecosystem contains multiple stakeholders which influence each other to establish the current trend of the sector's growth. The key ones include real estate developers, regulators, investors and consumers which form the essential value chain of the real estate sector (as highlighted in figure 3).

Figure 3: Key Stakeholders in Green Real Estate Ecosystem

Like most businesses, the real estate developers drive green and energy efficient buildings only if they get a demand from their customers; incentives from government and access to finance from investors. Fallout from any one of them would dissuade real estate developers from putting their money and interests in this niche sector, which in turn would impact the green real estate growth (as highlighted in figure 4).

Figure 4: The interdependency of green real estate value chain

Source: Global Trends in Sustainable Real Estate, 2008, Jones Lang Lasalle
Case for Green Buildings in India

The Indian economy is often considered among the fastest growing economies in the world. High population growth, coupled with rapid urbanization has created the right atmosphere for a booming real estate sector. At present, the building and construction industry constitute one of the largest economic activities in India. According to European Business and Technology Centre (EBTC), built space in India will increase 5-fold from 20,000 million sq. ft. in 2005 to over 100,000 million sq. ft. in 2030.

However, there are environmental downsides to these growth trends. Buildings are large consumers of energy, land, materials and water, and at the same time generate vast quantities of solid waste both during construction and operation - posing an immense stress on natural resources. With an anticipated 500 million people living in urban India by 2020, the challenges for greenhouse gas emissions from electricity use in new and existing buildings, and building material manufacturing would increase significantly (Majumdar, 2013).

Another key challenge is the diminishing availability of water for urban areas (Malone, 2005), where most Indian cities rely heavily on groundwater for use in buildings. Ground-water levels in India are projected to have dropped from 1901m3/person/year in 2001 to 1401m3/person/year by 2030 which is well below the international benchmark for water stress of 1700m3/person/year (Kochhar, 2010). Rainwater harvesting and large scale water recycling are not widely implemented in urban areas despite demand for water often outstripping supply. An added problem for the urban water supply is that approximately 30% of water wasted each year due to leaking infrastructure. On the contrary, there is a need for greatly expanding clean water supply in rural India, where more than 75% of the population does not have access to sanitation (R. Kumar R. S., 2007).

The share of energy consumption by the building and construction sector i.e. 35% of total energy in the form of electricity (TERI, 2011) is very high as compared to its share in GDP (RBI, 2012) i.e. 7.8% in 2011-12 and thus, increased energy efficiency in the building sector and utilization of renewable energy are very important to contain the energy demand and dependence on the grid without jeopardizing growth of the Indian economy (RBI, 2012).

As per a research by Jones Lang LaSalle (JLL), India, the benefits of green buildings depend on the extent of sustainability features taken into consideration during its design stage (Vashishtha, 2013). Major cities of India are expected to develop about 200 million sq. ft. of commercial space and 45 million of retail space. This presents a unique opportunity for all the players in the green real estate ecosystem.
A closer look at the electricity consumption pattern of the residential sector shows that fans and lighting consume more than 60% of total the consumption. For the commercial sector, based on available information and logical assumptions, estimation has been made to get a broad understanding of the electricity consumption by the commercial sector in 2021. This estimation shows that if buildings continue to be built and operated in the conventional manner, electricity consumption by commercial buildings may increase by more than three times by 2021.

There is a huge potential to reduce this energy consumption by using efficient appliances and implementing other features such as daylight integration, use of passive architectural design and energy efficiency lighting and cooling systems. As per a World Bank Study (World Bank, 2008), electricity savings of 75,356 GWh can be achieved in 2021 by using efficient household appliances and there lies a tremendous potential to save energy by designing buildings in line with climatic requirements – majority of buildings constructed in the country are not responsive to the climate thus leading to inefficient energy consumption.
Case Study
Understanding the economics of green building is a crucial factor driving the case for growth of the green real estate development in the country. The sustainability measures undertaken by the developers from the very start of the building process not only lead to tangible benefits such as lower operational costs, efficient use of material resources but also augment the brand image of the developer for a consumer. However, there exists a common perception among developers that constructing a green building may not be cost effective. However, this may not be the case over the lifetime of a project. The case study below is intended to highlight the business case for green buildings in India and to establish that a green building is cheaper than a conventional building when costs of construction and operation are considered across the entire life cycle.

TERI conducted a study in 2009 to assess the economic feasibility of incorporating energy efficient design features in rated buildings with reference to improvements in their energy performance for a leading International bank in India. In this study, 7 building cases were selected on the basis of select parameters. A study period of 25 years for the building was taken for the research study. The costs were segregated into three major categories:

A. **Single costs:** Costs which occur only once during the service life of the building. These costs comprise initial investment cost, capital replacement costs, and resale value of buildings

B. **Uniform annually recurring costs:** Costs which occur every year during the service life of the building. These costs include operation, maintenance and repair costs

C. **Non-uniform annually recurring costs:** Costs which occur every year but tend to escalate every year of the service period of the building. These costs include the energy costs of the building due to lighting, HVAC, equipment and electrical systems of the buildings

A comparative was drawn between a conventional building and a green building. The green buildings considered as a part of this study have achieved the highest rating such as platinum/5 star from different rating systems.

**Findings of the study were as follows:**

I. Comparison of the life cycle costs over 25 years of green vis-à-vis conventional buildings showcased that green buildings have significantly lower life cycle costs than their conventional counterparts. The life cycle costs, according to the research case study, were found to be 35% lower as compared to conventional buildings over a span of 25 years

II. While there are incremental costs ranging from 4% to 32% of the initial capital investment, the payback of 1-3 years and adjusted internal rate of return of 19% to 29%, with cash savings, not only compensates for the initial cost but also provides benefits to the owners/occupants throughout the lifetime of the building

III. Over 25 years of each of these seven buildings, 13,746,722 MWh was saved and consequent 11,68,471 Tonnes of CO2 emissions were avoided
IV. The research also showed that there exists a water saving potential of up to 72% by incorporating simple water saving strategies such as use of efficient fixtures, reuse of recycled grey water, harvested rain water to meet requirements for irrigation, flushing, ac-make up, etc. At present due to an inefficient water pricing mechanism, the potential of financial savings from water savings may not seem significant. However, at a later date, when the pricing of water reflects the state of affairs, it will lead to substantial financial savings as well.
Chapter 2: Obstacles to Growth
Obstacles to Growth

India is one of the fastest growing economies in the world following the trajectory of rapid development. Over the years, India has experienced significant growth in both its GDP and population. This burgeoning pressure of population and fast pace of growth is affecting India’s development patterns which are resulting in rapid urbanization, high demand for infrastructure and imposing a pressure on resources such as energy, water and building materials. These trends in the long run will have a substantial impact on the environment.

While the real estate sector in India has grown exponentially in the last six decades (Economic Times, 2013), there is a huge potential to mainstream green buildings in the Indian real estate sector. The purpose of this survey is to understand the impediments to the growth of green real estate and to highlight the challenges before the sector.

Survey Findings & Interpretations

The figure 5 highlights the key challenges of the sector as per the survey respondents – more than 70% of them believe that the notion of high costs of green buildings and lack of awareness on the intangible and tangible benefits of green building are the biggest barriers, the sector faces. Coupled with this, low customer motivation to pay high premiums and a missing ecosystem of government program implementations, supply chain infrastructure and lack of financial incentives are the second largest barriers as per our respondents. The forthcoming sections shall cover these aspects in details and also present the ground realities of these sectors.
Figure 5: Lack of awareness and notion of high cost are the leading barriers

<table>
<thead>
<tr>
<th>Barrier</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Notion that green/energy efficient buildings cost more</td>
<td>72%</td>
</tr>
<tr>
<td>Lack of awareness on benefits of green buildings</td>
<td>71%</td>
</tr>
<tr>
<td>Low/Nil motivation of consumer to pay premium for green buildings</td>
<td>65%</td>
</tr>
<tr>
<td>Lack of mandatory policies/programs from local and central govt.</td>
<td>63%</td>
</tr>
<tr>
<td>No clear business benefits – split incentives as developers don't directly benefit from green buildings</td>
<td>61%</td>
</tr>
<tr>
<td>Green Real estate not a strategic priority for the company</td>
<td>42%</td>
</tr>
<tr>
<td>Lack of financial instruments</td>
<td>41%</td>
</tr>
<tr>
<td>No peer pressure – Green buildings not taken by mainstream developers</td>
<td>40%</td>
</tr>
<tr>
<td>Inefficient/cumbersome supply chain of green building materials</td>
<td>32%</td>
</tr>
<tr>
<td>Lack of support from top management</td>
<td>16%</td>
</tr>
<tr>
<td>Others</td>
<td>8%</td>
</tr>
</tbody>
</table>

Source: YES BANK – TERI BCSD Study 2014

Underlying notion that a green building costs more, hurting the sector the most

Our survey of 150 senior – mid management professionals across the green real estate value chain reveals a complex underlying problem ailing this sector. As highlighted earlier (Figure 5), majority of our respondents
(72%) believe that the notion that a green building costing more is proving to be the most crucial barrier towards this sector’s growth. On further probing the survey reveals that more than 50% of the respondents agree to a large extent that this is just a notion and that there isn’t a huge margin between the total costs incurred in a green building vis-à-vis a conventional building (Figure 6).

There lies a paradox in this finding. While a certified green building may have higher capital costs than conventional buildings, the operational costs over the lifetime of the building (USGBC, 2012) are lower than, thus making a green building more cost effective and resource efficient over its lifetime than a conventional building. Research suggests that most investments in green buildings will eventually have a better payback due to decrease in the wake of increasing energy and water costs in the future (Kilbert).

**Figure 6: High cost of a green building is more of a notion than reality**

To what extent do you agree with the following statement:
High cost of a green building is just a notion and actually the cost is equal to a normal building

- Strongly Agree: 25%
- Somewhat Agree: 48%
- Disagree: 27%

*Source: YES BANK - TERI BCSD Study 2014*
Enforcement of local and central mandatory norms missing

While there are national building codes which cover critical elements of safety and address environment clearance measures in buildings, the only energy-related instrument encouraging adoption of green buildings is the Energy Conservation Building Code (ECBC) 2007, which applies to buildings, built over an area of more than 1,000sq.m.

Over 60% of our survey respondents recognize lack of coordinated and mandatory provisions of local state and central government are a major barrier towards growth of green real estate sector (Figure 5).

Considering the hidden costs and market failures with respect to resource pricing such as misplaced incentives, twisted fiscal and regulatory policies, that characterise the building industry, regulatory and control measures, though much needed, may not be able to support a market transformation in the sector alone (grida.no, 2011). These measures need to be combined with other pricing instruments like tax exemption/rebate, financial incentive, preferential loans, etc. for greater impact, considering realities such as the level of development of the local market and household income-levels (UNEP-FI, 2011).

Stakeholders are not fully aware of the benefits of a green building

It is clear from the figure 5, that stakeholders are not fully aware of the complete spectrum of tangible and intangible benefits of a green building (71%). This finding presents a unique opportunity for real estate developers, advisors, rating agencies and other stakeholders to widely disseminate information and in-depth knowledge of the realized benefits of green buildings through seminars, reports, workshops and other modes of communication, as highlighted by 76% of the respondents (Figure 7).
Customers are not willing to pay premium for certified green buildings

A whopping 96% of our survey respondents (Refer Figure 8) agree that an Indian consumer, both at an individual and an organizational level, shirks at the idea of paying a premium for a certified green real estate asset. Customers in India are extremely price sensitive and prefer to settle for accommodations with more rooms than investing more for buying a green building at a premium. From the overall findings of the survey, a potential correlation between lack of realized benefits of green buildings among stakeholders and the unwillingness to pay a premium can be inferred.
Financial barriers for green real estate projects

Financial institutions are faced with an array of major hurdles to fund energy-efficiency projects in buildings: low financial returns, credit risks, uncertainty, and difficulty in evaluating the added financial value of green buildings. Further, if the projects are small-scale, they do not fit into the traditional financial basket (grida.no, 2011).

The survey respondents identified an array of financial barriers hurting the green real estate sector today in India. As depicted in Figure 9, close to 58% of the survey respondents felt that the financial institutions today are not aware of the innovative credit lines available in the market for financing energy efficient building projects. Around 51% of the respondents believe that lack of preferential lending rates to green building projects also leads to discouragement, while 38% feel that green buildings are improperly valued, thus disincentivizing the real estate developers from building a green estate project. Close to 33% of the survey respondents also highlighted that high upfront fee for a loan

Source: YES BANK-TERI BCSD Study 2014
is also a financial barrier, due to which many small and medium sized real estate developers are dissuaded from investing in such projects.

**Figure 9: Financial barriers faced while constructing a green real estate project**

<table>
<thead>
<tr>
<th>Barriers</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fls not fully aware about innovative credit lines available for energy efficient real estate</td>
<td>58%</td>
</tr>
<tr>
<td>Lack of preferential lending rates</td>
<td>51%</td>
</tr>
<tr>
<td>Nil/ Low valuation of green buildings</td>
<td>38%</td>
</tr>
<tr>
<td>High upfront fee</td>
<td>33%</td>
</tr>
<tr>
<td>Lack of access to finance</td>
<td>26%</td>
</tr>
<tr>
<td>Nil/low resale value of green buildings</td>
<td>19%</td>
</tr>
<tr>
<td>High loan processing fee</td>
<td>18%</td>
</tr>
<tr>
<td>Others</td>
<td>14%</td>
</tr>
</tbody>
</table>

*Source: YES BANK - TERI BCSD Study 2014*

According to a recent UNEP-FI study on green buildings and finance sector in North America (UNEP-FI, 2011), there are four principal roles that financial institutions play in the green building process: owner or user, investor or private developer, lender, and insurer. The study also highlights that barriers and risks to the Fls include the need to explore a new type of “green lease” which would align incentives, clearly allocate responsibility, and set rules for various sustainable practices.
Other barriers presented in the study include lack of information on the value proposition of green buildings, which could lead to missed opportunities and inconsistent valuation; general lack of knowledge among financial and project appraisal professionals about the opportunities presented by green buildings, and the common impression that green buildings involve significantly greater upfront costs, and potential liability and litigation issues (UNEP-FI, 2011).

A case study conducted by JONES LANG LASALLE MEGHRAJ research on the cost-benefit analysis of LEED certified buildings for One Indiabulls Centre in Mumbai demonstrated a payback period for the cost premium of 2 – 3 years. The benchmark taken in the study was other gold rated LEED certified buildings in India. This research gives a first-hand insight into proving that green buildings make financial sense, inspite of the perceived high costs.

The case of split incentives for a green building developer

Another barrier highlighted by 60% of our survey respondents (figure 4) is the issue of split incentives i.e. the benefits of energy savings may not go directly to the person making the investment. For example, the owner of a building may make the energy efficiency investments, but the occupier may receive the benefit of lower energy bills (although landlords could benefit from higher rents but that would make them incompetent with the prevalent market rates). On the other hand, if the landlord is responsible for the energy bills, the tenant has no direct incentive to invest in saving energy (UNEP, Green Economy, and Buildings 2011)
**Expert Speak on Green Real Estate Sector in India**

“There are no incentives for the voluntary construction of green buildings and green infrastructure other than brand image. In tier-1 cities, there is some appreciation by the customer for such buildings since they save power and water cost substantially. Currently, wherever the power tariff for the commercial buildings is very high, there is some interest to construct green commercial space. There are no building codes like that in Singapore where the Govt. insists on the recyclable content in the concrete, mandatory solar power generation and vertical gardens in the buildings apart from the air conditioning standards. There is a requirement of a regulatory framework for commercial buildings as well as residential complexes including mandatory water recycling, water harvesting, solar power generation, waste composting, air conditioning standards and recycle content to be used in the new buildings. Environment Product Declaration of all raw materials used in a building should be made mandatory.”

K.N. Rao,
Director – Energy & Environment, ACC Limited

“Higher loan interest rate; lack of delivery within the committed period; insecurity of job amidst the gloomy economy and not an encouraging Foreign Direct Investment (FDI) can be considered as some of the major factors attributing to slow growth of real estate in general. While cost of a green building is higher by approx. 15 to 25% as compared to conventional buildings, there is no encouraging tax benefit available for promoters of green buildings. Moreover, even for the purchaser/lessee, there is no such encouraging/significant discount in the interest rate available against loan taken. Promoters could take a smart approach of translating the intangible benefits into tangible ones that are linked to monetary savings through a third party endorsed report to increase purchase/usage of green building.”

Rajib Kumar Debnath,
Director – Sustainability, Deloitte

“The growth of green real estate in India has largely been curtailed. This can be attributed to limited awareness of benefits associated with green buildings amongst end users as well as several myths surrounding such developments. It is largely perceived that development cost of green buildings is significantly higher and the certification process is cumbersome. However, in reality incorporation of basic green features can be achieved in with a minimal cost increase of 5%-10%. Moreover, there are no fiscal incentives which can stimulate development of such buildings. Furthermore, it is perceived that demand for green buildings is limited. However, several multinational companies and large Indian corporate entities have been actively looking at such developments as part of their Corporate Social Responsibility and interventions to reduce carbon footprints. Fiscal incentive, similar to those offered to IT building developments, will stimulate construction of green buildings in India. The incentives will help developers reduce cost which can be passed on to end users. Additionally, initiatives such as providing faster environmental clearance for green building projects and additional floor area ratio for green developments will encourage developers to focus on green real estate in India.”

Anuj Nangpal,
MD – Investor Services, DTZ

“Green real estate is very important given that this sector has a high contribution on total Carbon emissions. Its growth is rather slow and needs to be significantly increased through awareness sessions, policy mandates, financing support and other incentives.”

Shubhenjit Chaudhuri,
Chief – Corporate Sustainability, TATA Steel Ltd.
“Awareness in terms of the net impact the green building compared to a conventional building needs to be quantified in tangible values and communicated. This can help in advocacy of the concept and decision making. Else, it will remain as another good thing to do. Policy and regulatory interferences are critical for the growth of this segment. It has to be the combination of carrots and sticks.”
Santhosh Jayaram, Technical Director – Sustainability Advisory, KPMG India

“Financially viable energy efficiency investments are not being realized by stakeholders mainly due to “non-technical” barriers consisting of financial or regulatory complexity and/or constraints associated with implementation capacity of stakeholder organizations. Energy Efficient Building (EEB) market uptake is hindered by the inability to establish strong and certain financial return for decision makers. The full spectrum of “co-benefit” value created in the marketplace by EEB investments is often not defined, not valued and not captured by a comprehensive value proposition. WBCSD is developing market-oriented “toolkits” for different building segments to enable building market stakeholders to realize financially viable EEB investments or to facilitate investments by others. The toolkits will become the means by which motivated decision makers can be assisted in their markets to increase energy efficiency uptake.”
Joe Phelan, Director - WBCSD India

“Investments in the built environment space have to incorporate sustainability concerns as this is and will continue to be an area which will consume huge resources in construction and operational stages. ITC appropriately factors in these concerns in all its built environment investments as part of its continued commitment towards improving resource use efficiencies and national priorities in this area. All large offices and hotels are built and certified for LEED conformity at Gold/Platinum levels and even existing factories are being renovated to meet these requirements.”
Sanjib K Bezbaroa, VP – Corporate EHS, ITC Ltd.

‘The principal reason for the slow growth of the green real estate sector in India can be drawn from an analysis of the green sector’s experience in the West. Potential customers like the idea of green building design and eco-friendly building systems, but they are usually not willing to pay more money for it. So long as green designs and other eco-friendly building systems add more than 5% to the cost of the building or system, it is a tough sell. The data on life-cycle costing, offsets this effect to some extent, but the information on life cycle costs is not assembled in a uniform and common manner in the industry, and it has very little historic depth, so is not as powerful in convincing a real estate client to “go green.” Real estate customers are, by and large, willing to endure the organizational change associated with different uses and expectations associated with green real estate; but until the design improvements and eco-friendly process innovations can be made a part of the real estate product for nearly the same price as traditional designs, this sector will not take-off the way it should.”
Scot Wrighton, City Manager - Lavasa Corporation Ltd. (An HCC Group company)
Chapter 3: Transforming the Sector
While there are many barriers and challenges which the green real estate sector faces today; our study focuses on certain crucial actions which will bridge the gap and drive the sector’s growth in the country.

The international trends in the green real estate sector can be understood by a recent Ernst & Young study (EY, 2013) on Brazilian real estate market which highlights that, the return on investment is 9.9% higher for new construction and 19.2% for existing buildings if they are certified as green vis-à-vis the Return on Investment (ROI) for a conventional building. It also highlights that investment in sustainable construction can reduce condominium expenses by as much as 10% over the entire service life of a building—50 to 60 years—calculated based on savings from energy, water and operational costs, such as maintenance and renovation (EY, 2013).

Survey Findings & Interpretations

55% of the survey respondents (Refer Figure 10) agree that investment in green real estate is gaining momentum as it enhances the brand and reputation of a company. Approximately 50% of the respondents feel that green real estate is an International trend, and 40% of them feel that governmental and municipal body incentives are favouring investment in India.
We believe that it will be important for all stakeholders to identify their roles for bridging the gap. Given below is what the survey respondents believe must be the role of stakeholders to overcome the barriers and spur growth in the sector.

**Role of Real Estate Developers**

It is evident from the survey results (refer Figure 5 and 6) that there exists a common perception among most customers and green real estate developers that a green building might cost more than conventional
building, which may seem to be true at first glance until the lifecycle costs are incorporated in the ambit of the discussions, which almost always justify the business case for green building development. There is a pertinent need to establish the business case for green buildings by working with select developers through a multipronged approach and also share internationally recognized best practices and case studies.

**Role of the Policy Makers and Regulators**

Various policy frameworks to promote design, construction and operation of green buildings have been formulated and implemented at different levels in India. As illustrated in [figure 11](#), majority of the survey respondents (76%) believe that mandating green building codes and municipal bylaws for all future buildings, coupled with innovative financial incentives from lenders would give a significant push to this sector’s development. Incentives such as provision of more floor area ratio and preferential loans would also aid in the overall growth of green real estate sector.

**Figure 11: Policy Requirement of green real estate sector**

<table>
<thead>
<tr>
<th>Policy Requirement</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mandatory green building codes and municipal by-laws for all buildings</td>
<td>76%</td>
</tr>
<tr>
<td>Innovative financial or fiscal incentives from lending agencies</td>
<td>70%</td>
</tr>
<tr>
<td>Special loans for financing initial high cost of energy efficient technologies</td>
<td>68%</td>
</tr>
<tr>
<td>Incentives like more Floor Area Ratio (FAR) for energy efficient buildings</td>
<td>67%</td>
</tr>
<tr>
<td>Ensuring real energy price tariff (without subsidies)</td>
<td>46%</td>
</tr>
<tr>
<td>Disincentives (Penalty) for buildings not following green building code &amp; policies</td>
<td>45%</td>
</tr>
<tr>
<td>Encouraging Energy performance contracting agencies (ESCOs)</td>
<td>40%</td>
</tr>
<tr>
<td>Others</td>
<td>12%</td>
</tr>
</tbody>
</table>

*Source: YES BANK - TERI BCSD Study 2014*
The survey also discloses that 75% of the respondents (Figure 12) strongly feel that strict monitoring of all new government and PSU buildings should be done to check if they are complying to green norms as mandated by the Indian govt. in 2011 (Financial Express, 2010).

**Figure 12: Stricter enforcement of regulations is essential for the sector’s growth**

Although we have green building codes and rating systems in India, number of certified green buildings in India has not shot up in last few years (Times of India, 2013). In lieu of that, the survey also reveals that 82% of the respondents (**Figure 13**) strongly believe that robust green building policy for all future projects would significantly affect this sector.

**Source:** YES BANK - TERI BCSD Study 2014
Role of the Corporate Customers in the sector revival

Internationally, investment in green buildings and offices is considered as a strategic priority among leading corporate and individual customers. However this trend is yet to be picked up by Indian companies.

High demand for green buildings from customers, both corporate and individual, would lead to this sector’s revival to a great extent. The survey also reveals (Figure 14) that around 74% of our survey respondents agree that the corporate customer demand for green buildings would arise if it is part of their company policy & 70% of them believe that conducting regular energy audits would help organizations in identifying areas where energy and financial savings could be accrued, which would help build a business case for corporate to choose green buildings over their conventional counterparts. Further, 62% of them believe that considering green buildings builds brand reputation and strong public image for the corporate sending out a positive message to its stakeholders.
Figure 14: Factors aiding corporate houses to choose green buildings as offices

What factors do you think help companies (which are not real estate developers) to actively convert their buildings into green buildings/choose green buildings as offices?

Respondents identifying each factor among their top three choices

<table>
<thead>
<tr>
<th>Factor</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part of the companies’ corporate policy</td>
<td>74%</td>
</tr>
<tr>
<td>Energy audits help in identifying areas in building where energy/materials can be saved</td>
<td>70%</td>
</tr>
<tr>
<td>Company has realized the operational cost savings on their green buildings</td>
<td>68%</td>
</tr>
<tr>
<td>Part of companies’ brand image/PR campaign</td>
<td>62%</td>
</tr>
<tr>
<td>Top management push</td>
<td>60%</td>
</tr>
<tr>
<td>It is a feel good factor for the company’s employees</td>
<td>28%</td>
</tr>
<tr>
<td>Others</td>
<td>13%</td>
</tr>
</tbody>
</table>

Source: YES BANK - TERI BCSD Study 2014

Role of Financial Institutions in sector revival

According to a recent UNEP-FI study on green buildings and finance sector in North America (UNEP-FI, 2011), there are four principal roles that financial institutions play in the green building process: owner or user, investor or private developer, lender, and insurer.

The owner/user role of a financial institution implies that the office buildings and branches of the banks and FI’s are certified green buildings. The investor role is a direct role implying participation in development of green building projects as a loan/equity provider, investment in green real estate funds, and attention to Responsible Property Investing strategies. Financial institutions are also increasingly moving in the insurance domain, offering green buildings products and services (UNEP-FI, 2011).
As Figures 15, 16, 17 illustrate, majority of the survey respondents agree that, new credit lines for financing green real estate, including this sector as a priority sector for banks and offering special loan rates to the green real estate developers would help in the sector’s revival. This suggests that while the importance of regulatory and customer driven factors is important, a special importance is being placed by the real estate developers on the financial community’s side.

**Figure 15: Financial sector’s special lending rates to certified green buildings**

- 10% Strongly Agree
- 31% Somewhat Agree
- 59% Disagree

*Source: YES BANK - TERI BCSD Study 2014*

**Figure 16: Considering Green Real estate as PSL mandate for banks**

- 16% Strongly Agree
- 43% Somewhat Agree
- 41% Disagree

*Source: YES BANK - TERI BCSD Study 2014*
Figure 17: Financial sector’s new credit lines for green real estate sector

Source: YES BANK - TERI BCSD Study 2014
In India, National Housing Bank (NHB) and Small Industries Development Bank of India (SIDBI) have led the way to mainstream green building in India. NHB and SIDBI have utilized the concept of green buildings in India to develop and implementing social and environmental checklist for project finance, capital investments and extension of credit; map GHG emissions associated with lending portfolios; engage in instruments (products/services) delivering social value such as housing; and deriving business opportunities such as upfront finance against GRIHA compliant projects.

SIDBI has initiated a Line of Credit (LOC) to help finance of green buildings through the GRIHA/LEED/ECBC framework whereby a concessional interest of 75 bps for rated/pre certified projects (non-residential) and energy efficient components of non-residential buildings shall be provided (grihaindia.org). As per this mechanism, the following pre-disbursement conditions may be stipulated:

- The company/firm may obtain a pre-certification from certifying agencies like GRIHA/LEED
- Further, the company/firm may agree that after the building has been constructed, it would submit a compliance certificate from respective certifying agencies

In case the company/firm is not able to produce the certificate the benefit of concessional interest rate would be withdrawn from retrospective effect.

NHB has also formulated a Scheme called, Energy Efficient Housing Scheme (EEHS), 2011 for lending towards energy efficient housing units/buildings. The building projects which are designed in a way that fulfill the energy efficiency requirements (at least 30% saving based ResBuild India (TERI) calculations, (nhb.org.in)) will be included under the promotional programme. Focus may be on the building projects that are currently in the process of development and sale of energy efficient apartments. This is to contribute to reduction in emission of GHGs, and thus helping towards mitigation of climate change for a sustainable economic development (nhb.org.in).

Housing Finance Companies (HFCs) are expected to utilize this Refinance Assistance and assist such persons to have an energy efficient shelter of their own by extending need-based housing loans to them. HFCs are also encouraged to avail of refinance from NHB under its other scheme to enable ‘leverage’ of EEHS so that the principal objective of increasing housing stock in the urban areas is served. Accordingly, the refinance availsment procedures at NHB have been redefined to provide for single point contact, approval and disbursement (nhb.org.in).
Special Focus
Special Focus: Jones Lang LaSalle on Sustainability in Real Estate

The scale of policy-level incentives for technology applications continues to be constrained for manufacturers of related products and equipment, as well as developers and consumers of green buildings. To be more precise, the incentives being offered are not consistent across all states, and in states where they exist, the implementation mechanism is not consistent. While the environmental clearance norms have gained traction over the years, this has arguably had a negative impact on growth because states have not evolved with the adoption of appropriate and adequate machinery to implement these norms. This has created a backlog which has further slowed the growth of green real estate.

The process of providing environmental clearances, while being provided for green buildings, is inherently slow, resulting in reduced effectiveness of this incentive. From the perspective of developers, there appear to be limited incentives for enabling green initiatives, and current technologies are either too expensive or do not address the requirements of such projects. While proactive efforts, such as providing extra Floor Space Index (FSI) for projects that incorporate green initiatives and property tax rebates for green developments, have been made by some local bodies, they are not prevalent on a large scale.

From the consumers’ perspective, there is a need for creating higher awareness about the long-term benefits of patronizing green developments. In terms of awareness, one of the most commonly lacking aspects is a grasp of the short-term cost versus long-term benefits of mainstreaming green initiatives. Awareness on green real estate needs to be boosted by some compelling case studies. Most of the case studies that exist today are of developments outside India, so they do not tend to inspire developers. Such case studies need to be presented to tenants and landlords with metrics that makes them compelling for both developers and consumers to opt for the green alternative. Such adaptation is not too much in evidence today, with extremely limited and piecemeal efforts.

Among the interventions that would aid the growth of the green real estate sector in India, consistency and effectiveness of both legislation and incentives is probably paramount. At the level of urban local bodies, efforts need to be made to perform cost-benefit analyses of mainstreaming green initiatives/technologies, and designing incentives that will spur demand for green developments. These need to be viewed from the perspective of city-level infrastructure (transport, roads and intelligent technologies) and individual developments (residential, commercial office, retail and industrial).

At the developer level, platforms need to be created that allow for a higher level of interaction between entrepreneurs who drive technological innovations and manufacture products that promote green developments, and developers who may consider adopting these technologies. These platforms could allow for customized solutions for varying scales of projects, with a view to according benefits to both stakeholders.

Additional awareness drives need to be undertaken to enhance consumers’ understanding of the Green Prerogative and its holistic benefits. These awareness drives could be promoted at the level of Resident...
Welfare Associations (RWAs) where interactive platforms can be created with entrepreneurs who are manufacturing green technologies, and end users. Such drives could result in innovative solutions both at individual household and neighborhood/community levels. A proactive outreach to end consumers with a view to making green real estate more attractive at a macro level is, in fact, a key factor.

A cue can be taken from the success of the energy star program for consumer appliances. With more than 60% of future development likely to be residential, it makes a lot of sense to ensure that green real estate rides on intensive awareness programs and incentives, such as:

- Tax rebates for buyers of green equipment
- Property tax breaks/holidays for green property owners to offset initial capex
- Lucrative financing options for the purchase of green equipment.

Another concept that earlier saw a significant amount of global discussions is ensuring that some amount of direct, unobstructed sunlight is available to each unit for a minimum number of fixed hours in a day. Making this mandatory through mechanisms, such as byelaws for all new developments, would force building designs to be more responsive to climatic conditions via geometrical alignments. This ‘passive response’ measure would reduce energy consumption without any additional expenditure, merely by design interventions. In addition, existing building stock needs to be addressed through performance reporting and rewards. Also, the cost of green power needs to be at par with or lower than traditional power.

The baseline objective behind such initiatives would be to boost consumer demand for green real estate, which in turn would result in the augmentation of its supply.

Rajat Malhotra,
Chief Operating Officer – West Asia,
Integrated Facilities Management,
Jones Lang LaSalle (India)
Chapter 4: Path Ahead - Recommendations
It is clear from the results obtained in this survey that sustainability issues are moving rapidly in the thinking and decision making of the green real estate value chain’s players. Greening the existing portfolio and sourcing sustainable real estate going forward represents both a tangible and increasingly measurable corporate effort to address the environmental impact of corporate occupiers. Respondents to our survey identified a range of factors most likely to influence changing attitudes towards sustainability over the short to medium term.

Since this sector is a dynamic sector which includes multiple stakeholders in its value chain – policy makers, real estate developers, customers and financial institutions; their role in reviving the sector is crucial. Given below are some of the key recommendations for the various players.

Financial Institutes

The financial service sector is positioned to play an important role in mobilizing rapid development of green real estate in India. Presented below are some recommendations for this sector:

• Develop and implement social and environmental checklist for project finance, capital investments and extension of credit
• Map and understand Greenhouse-Gas (GHG) emissions associated with lending portfolios
• Disclose own sustainability performance in public domain
• Embed sustainability into every aspect of business, including supply chains, policies, marketing strategies and stakeholder relationships
• Engage in instruments (products/ services) delivering social value such as housing; and deriving business opportunities such as upfront finance for green real estate projects
Environment impact management for existing and new properties of banks

Given the large impact of the financial service sector on intermediaries of capital, the sector plays a critical role in contributing to sustainable development (RBI, 2012). The financial service sector is positioned to direct investments, and align them to meet objectives for ‘faster, sustainable and more inclusive growth’ set forth for the Twelfth Five Year Plan.

In summary, adoption of green building criterions within the lending portfolios and corporate policies of the financial service sector to meet the growth targets of the Twelfth Five Year Plan shall enhance:

- Preparedness for future compliance requirements
- Opportunities for technology/product innovation to tap into the market needs and deliver products that encourage green consumerism
- Brand reputation
- Ability to attract and retain skilled employees
- Competitive advantage
- Stakeholder relationships

Corporate Consumers

The corporate sector builds, owns and/or leases a significant part of the real estate across the country. In light of the fact that sustainability can only be implemented in its local context, the recommendations for corporate include:

- Company policies must ensure incorporation and implementation of green building guidelines, statutes and codes as per directions of the local/national government agencies
- Align upcoming building projects to comply with the national green building rating systems

The corporate sector could impact in a big way if all company policies lease resource efficient buildings only.
Directing upcoming built environment to comply with national and relevant codes and standards shall ensure monetary benefits (during operation of owned buildings) and also help quantify co-benefits such as additional employment generation, trees and top soil preserved, resources conserved and pollution avoided, which may help meet some objectives of corporate social responsibility as well.

**Retail Consumers**

Consumers, i.e. occupants and owners of green real estate are the prime beneficiaries in terms of monetary and financial gains of living/occupying green buildings. With rising prices of electricity and fossil fuel (to run diesel generator sets); and paucity of resource availability such as intermittent electricity supply, lack of water and issues around waste management, a resource efficient, green and rated building would provide the much required relief to the consumers. Specific recommendations for retail consumers include:

- Demand that developers make and sell green buildings so that there is resource availability during the tenure of occupation of the buildings
- Actively seek out new information about green features of a building and be open to change their lifestyle towards ensuring better health and financial returns

**Real Estate Developers**

The growing Indian economy, characterized by growth in construction activities, can help bridge the demand and supply gap of resources (including water, electricity) and optimize waste generation if all developers of the country were to design and construct resource efficient and green real estate. Credible implementation with existing codes and policies can help achieve that to a great extent; where the government has also introduced incentives such as fast track clearances and financial benefits (also detailed earlier in the report) to ensure robust compliance.
Recommendations for the developers include:

- Influence decisions of architectural design of their building at an early stage
- Use environment friendly products and materials during construction
- Train construction workforce to align their work towards sustainability
- Provide built up space that would be economical for the occupants to operate and green at the same time
- Disseminate the benefits of a green building widely to the buyer and consumer segment

It is pertinent for real estate developers to undertake a complete life cycle assessment approach to assess the cost/incremental cost or notion of incremental cost before implementing design decisions that could potentially lock occupants into resource inefficient buildings. With rising awareness and greater policy mandate, it is envisaged that demand for green real estate is pitched towards growth. Hence, it would only be beneficial and economical (to build cheaper and resource efficient buildings; and sell them at market price which is at par with cost of conventional buildings) for all developers who are positioned to steer the movement to gain greater strength.

Policy Makers and Regulators

The Government of India has instituted various codes and standards for the real estate sector to optimize its environmental footprint. While robust and credible implementation would lead to economic and financial benefits to all concerned stakeholders, there has been a strong demand for making the processes easier and incentivizing compliance, especially with the rating systems- from the developer community. Recommendations to the regulators include:

- Optimize the effectiveness of policy by encouraging a more holistic life-cycle approach to building
- Strictly enforce existing green building regulations by giving disincentives to non-complying developers
• Encourage and maintain coordination between centre and state agencies working in this area of increasing energy efficiency, renewable energy, water resources management, and waste management
• Encourage prior verification of site before implementation of green building codes and standards (grihaindia.org).

A perceived notion of high costs of green buildings, coupled with flawed and old interpretation, lack of clarity on application domain (such as the ECBC does not address energy efficiency in residential buildings), and lack on integration and uniformity of various codes and standards, is adding to impediments in implementation of sustainable habitats. A synergy within the various departments; or use of GRIHA as an integrated platform as has been recognized by several agencies and states across the country, shall ensure that an integrated approach to design and implementation of green real estate is achieved.
Special Focus: Regulatory Drivers for Real Estate Fund Managers

As per a 2013 PwC study (PwC, 2013) on key sustainability trends driving business value in the real estate sector internationally, the real estate investment funds across USA are receiving an increasing number of inquiries from institutional investors who want to better understand Environment-Social-Governance (ESG) practices and performance of their real estate investments. The queries of the institutional investors typically include questions on ESG considerations in financial institutions' (FI) investment decisions, their ESG policies, understanding of material ESG issues pertinent to an FI's business and communication strategies of FIs for their stakeholders to be aware of ESG activities.

On being asked about their role in driving green real estate sector in India, more than 50% of the fund managers and financial institutions agreed that a green certification of a building increases its value and the premium it commands by a huge margin, vis-à-vis a conventional building. The survey also reveals that most of the FIs and fund managers usually don't consider green building practices in their own premises. The situation also becomes grim from the big investors end since they are not demanding acquisition of green properties (Refer Figure 18).

**Figure 18: Financial Institutions should explore new credit lines for green estate financing**

According to banks/ real estate fund managers/ Real estate advisors & consultants; what factors drive green real estate investment in India?

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Are real estate investors across India demanding that investment managers acquire properties that address sustainability?</td>
<td>70%</td>
<td>30%</td>
</tr>
<tr>
<td>Large occupiers demand sustainable buildings for their leased office spaces?</td>
<td>57%</td>
<td>43%</td>
</tr>
<tr>
<td>Do investment managers consider a property’s sustainability in their underwriting process for new investments?</td>
<td>68%</td>
<td>32%</td>
</tr>
<tr>
<td>Do investment managers evaluate sustainability performance of the properties they own?</td>
<td>74%</td>
<td>26%</td>
</tr>
<tr>
<td>Do you as a real estate investment manager agree that a property’s value increases if it is LEED/IGBD/GRHHA certified?</td>
<td>34%</td>
<td>66%</td>
</tr>
<tr>
<td>Do you agree that a LEED certified or energy efficient building in India commands rental premium?</td>
<td>50%</td>
<td>50%</td>
</tr>
</tbody>
</table>

**Source:** YES BANK - TERI BCSD Study 2014

However, the real estate funds are now being questioned in order to be ranked by sustainability rating agencies like TruCost and Sustainalitics among others on their ESG performance. The study (PwC, 2013) highlights that in response to the growing investor and market interest; real estate investment funds are developing ESG reporting strategies to report on voluntary sustainability reporting forums like the Carbon Disclosure Project (CDP) and the Global Real Estate Sustainability Benchmark (GRESB) to enhance their reputation on ESG issues.
Another important driver internationally is the legal requirement to the property owners by the government and municipal bodies to disclose and benchmark their buildings’ energy performance. For assets with poor energy performance, greater transparency into building energy use and the associated operating costs for prospective tenants or buyers may increase lease up times, reduce effective rental rates and reduce asset value at disposition (nreionline.com, 2013).

PwC’s study highlights that the FTSE Group, the National Association of Real Estate Investment Trusts (NAREIT) and the US Green Building Council (USGBC) have collaborated to develop a family of green property index funds that will rate the indexes’ fund constituents based on the proportional value of their holdings that have achieved USGBC’s Leadership in Energy and Environmental Design (LEED) certification or Energy Star labelling. The study also highlights that as a result of the corporate tenant demands, LEED has become a baseline standard for new development, particularly in the office segment, in many metro markets (e.g. New York City, Washington, DC, and Chicago have the most LEED certified projects with over 2,500 as of May 2012).
List of Acronyms
List of Acronyms

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BEE</td>
<td>Bureau of Energy Efficiency</td>
</tr>
<tr>
<td>C&amp;S</td>
<td>Core and Shell</td>
</tr>
<tr>
<td>CAGR</td>
<td>Compound Annual Growth Rate</td>
</tr>
<tr>
<td>CDP</td>
<td>Carbon Disclosure Project</td>
</tr>
<tr>
<td>CII</td>
<td>Confederation of Indian Industries</td>
</tr>
<tr>
<td>CoP</td>
<td>Coefficient of Performance</td>
</tr>
<tr>
<td>CPWD</td>
<td>Central Public Works Department</td>
</tr>
<tr>
<td>DFIs</td>
<td>Development Financial Institutions</td>
</tr>
<tr>
<td>EBTC</td>
<td>European Business and Technology Centre</td>
</tr>
<tr>
<td>ECBC</td>
<td>Energy Conservation Building Code</td>
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<tr>
<td>EEHS</td>
<td>Energy Efficient Housing Scheme</td>
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<tr>
<td>EIA</td>
<td>Environmental Impact Assessment</td>
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<tr>
<td>ESCo</td>
<td>Energy Service Company</td>
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<tr>
<td>ESG</td>
<td>Environment Social Governance</td>
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<tr>
<td>FI</td>
<td>Financial Institution</td>
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<tr>
<td>GDA</td>
<td>Global Development Alliance</td>
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<tr>
<td>GHG</td>
<td>Green House Gas</td>
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<tr>
<td>GRESB</td>
<td>Global Real Estate Sustainability Benchmark</td>
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<tr>
<td>GRIHA</td>
<td>Green Rating for Integrated Habitat Assessment</td>
</tr>
<tr>
<td>HFCs</td>
<td>Housing Finance Companies</td>
</tr>
<tr>
<td>HVAC</td>
<td>Heating Ventilation and Air Conditioning</td>
</tr>
<tr>
<td>IGBBC</td>
<td>Indian Green Building Council</td>
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<tr>
<td>IIIEC</td>
<td>International Institute for Energy Conservation</td>
</tr>
<tr>
<td>JLL</td>
<td>Jones Lang LaSalle</td>
</tr>
<tr>
<td>Abbreviation</td>
<td>Full Form</td>
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<tr>
<td>--------------</td>
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</tr>
<tr>
<td>LEED</td>
<td>Leadership in Energy and Environment Design</td>
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<tr>
<td>LOC</td>
<td>Line of Credit</td>
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<tr>
<td>MNRE</td>
<td>Ministry of New and Renewable Energy</td>
</tr>
<tr>
<td>NAPCC</td>
<td>National Action Plan on Climate Change</td>
</tr>
<tr>
<td>NAREIT</td>
<td>National Association of Real Estate Investment Trusts</td>
</tr>
<tr>
<td>NBFCs</td>
<td>Non Banking Financial Companies</td>
</tr>
<tr>
<td>NC</td>
<td>New Construction</td>
</tr>
<tr>
<td>NHB</td>
<td>National Housing Bank</td>
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<tr>
<td>NMSH</td>
<td>National Mission on Sustainable Habitat</td>
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<tr>
<td>PMC</td>
<td>Pune Municipal Corporation</td>
</tr>
<tr>
<td>PSL</td>
<td>Priority Sector Lending</td>
</tr>
<tr>
<td>ROI</td>
<td>Return on Investment</td>
</tr>
<tr>
<td>RWAs</td>
<td>Resident Welfare Associations</td>
</tr>
<tr>
<td>SIDBI</td>
<td>Small Industries Development Bank of India</td>
</tr>
<tr>
<td>TERI</td>
<td>The Energy and Resources Institute</td>
</tr>
<tr>
<td>USAID</td>
<td>United States Agency for International Development</td>
</tr>
<tr>
<td>USGBC</td>
<td>United States Green Building Council</td>
</tr>
</tbody>
</table>
References
References


RBI. (2012). Non financial reporting preparedness of banks in India.
RBI. (2012). Research Study: Non financial reporting preparedness of banks in India.


YES BANK, India’s fourth largest private sector Bank, is the outcome of the professional & entrepreneurial commitment of its Founder, Rana Kapoor and his top management team, to establish a high quality, customer centric, service driven, private Indian Bank catering to the Future Businesses of India. YES BANK has adopted international best practices, the highest standards of service quality and operational excellence, and offers comprehensive banking and financial solutions to all its valued customers.

YES BANK has a knowledge driven approach to banking, and a superior customer experience for its retail, corporate and emerging corporate banking clients. YES BANK is steadily evolving as the Professionals’ Bank of India with the vision of building the “Best Quality Bank of the World in India” by 2015.

With a vision to create a synergy for the corporate sector as a whole to move towards sustainability, TERI-BCSD (Business Council for Sustainable Development) India was set up by The Energy and Resources Institute (TERI) in 2001. It has now evolved into a strong industry body, with membership from diverse sectors, including public sector undertakings, multinationals, and private companies from across India. They work towards evangelizing business sustainability through industry specific initiatives that provide a platform for knowledge, learning and encourage sharing of best practices. It is also the Indian partner of the WBCSD (World Business Council for Sustainable Development), Geneva. TERI-BCSD India member company representatives identify, conceptualize and implement projects in partnership with researchers at TERI and the structure of the business council reflects this partnership. TERI provides research and implementation support to the business council and acts as the permanent technical resource for various theme specific action oriented projects, knowledge papers, seminars and capacity building workshops. Membership is by invitation only. For more information please visit www.teriin.org/bcsd