

Environment Impact Assessment for Buildings: Kid's gloves

Hell broke loose when the Union Ministry of Environment and Forests issued the January 19 2009 draft notification of Environment Impact Assessment (EIA) rules to exclude construction projects including the housing projects, commercial and retail construction that are less than 50,000 sq. mt. of built-up area from the ambit of the Environment Impact Assessment and the Environment Protection Act 1986. This was an attempt to extend the limit of 20,000 sq meters to more than 50,000 sq meters and thus make the EIA process ineffectual for buildings. .

In face of strong public criticism and also protests from the state governments the environment ministry had to back track and eventually drop this recommendation. As there are very few projects that have area above 50,000 sq meter meant that virtually the entire building sector would move out of the pale of the EIA regulations. In fact, nearly 90 per cent of the building plans sanctioned could go off the list thus numbing the effect of the regulations.

Even with the existing limits the project proponents are unable to provide proper environment management plan. Under the current legal and regulatory framework the large construction projects are in any case not assessed from the perspective of the resource adequacy – adequate drainage, ground water availability, waste disposal capacity, impact on available transportation system, road infrastructure, parking requirement among others. Neither the regional plans nor the master plans comprehensively include these. On the contrary, the state government are wilfully relaxing the building norms by increasing the FSI/FAR limits without assessing the impact on the resource base and the environment. The amendment would have provided easy exemption to almost projects.

Even the existing limit of 20,000 sq meters is violated rampantly as the project proponents seek project clearances in phases with each phase less than 20,000 sq meters and thus dodge the environmental clearances.

The industry was however euphoric. In fact, CREDAI (Confederation of Real Estate Developers Association of India) an association comprising all big players of India like Reliance, Tata, Bharti, Godrej, DLF etc had taken up cudgels against EIA rules on buildings since the 2006 amendments when all the projects which were between the range of 20,000 sq. mts to 1,50,000 sq. mts were brought within the net of EIA. The association had submitted their memorandum to the Prime Minister's Office (PMO) which was the direct authority to monitor the MoEF (Highlights of the petition submitted by the construction group association)

But during the consultation process on the proposed amendment the civil society and some of the key state governments including Haryana, Andhra Pradesh, Madhya Pradesh criticised this proposal and sought its rejection. Haryana even pointed out that the National Capital Region of Delhi will require even stricter controls as this had already become a dark zone due to depleting ground water levels. But the Union Ministry of Urban development supported this amendment.

This proposal then was only a logical conclusion to the process of dilution that had started with the 2004 amendment. Since then the rules have successively diluted (see box How EIA provisions on buildings have evolved).

While all this criticism helped to stop the amendment from going through the general provision on the buildings remained weak. The EIA requirements for the building industry are not as rigorous as the rest of the industry. Building industry is not required to conduct an extensive detailed EIA but instead fulfil certain requirements of furnishing basic information about their resource use according to the items listed in the Form 1 & Form 1A of the EIA rules for the clearance from the ministry or the ministry appointed state level authorities like the SEAC for each state. The new

construction projects or expansion and modernization of existing projects or activities shall require prior environmental clearance from the concerned regulatory authority. The project matter in the schedule falling under Category 'A' will require clearance from Central Government in the Ministry of Environment and Forests and at State level the State Environment Impact Assessment Authority (SEIAA) for matters falling under Category 'B' in the said Schedule, before any construction work.

The key issue that still remains is the setting up of the standard and norms for the State Expert Appraisal Committee and the capacity of the SEAC to perform the task. The construction industry in most states is growing fast at 10-17 percent annually. The states recording maximum urbanization rate in the range 50-30 percent (Maharashtra, Delhi NCR, Tamil Nadu, and Gujarat) also record highest number of projects. Ongoing pace of residential and commercial establishments in highly urban mega-city regions is challenging. At present, the robust and consistent mechanism, to assess the energy conservation building codes, waste water standards and norms, is not available for environmental clearances.

Box

How EIA provisions related to building have evolved?

Buildings were brought within the ambit of EIA notification for the first time in 1994. Since then through successive stages of amendment EIA rules have been consistently diluted and weakened until the very recent notification of 2009. This time the requirements have been diluted to such an extent that nearly the entire building sector barring the very big projects with area over 50,000 sq meters has been let off the hook. This series of changes in the EIA and exempt of many projects since the 2004 give the impression of progression of bonuses for the real estate industry.

The highlights of the key changes since 1994 are as follows:

EIA Notification 1994

For the first time it required new townships, industrial townships, settlement colonies, commercial complexes, hotel complexes, hospitals and office complexes, for 1000 persons or below with an investment of Rs 50,00,00,000 or below. But this notification was implemented until 2004.

EIA Notification 2004

In addition to the rules that were already established in 1994, it was further stipulated that all those new construction projects should also be included that discharge sewage of 50,000 litres per day.

With the inclusion of the sewage clause the EIA had tightened the grip on the most of the buildings that would render the maximum environmental damage.

EIA notification of 2006

This time the rules were amended to include different criteria for buildings that would require EIA. Building and construction projects with more than 20,000 sq meters to 150,000 m² of built up area under category A and townships covering an area more than 150,000 m² to 50 hectare or built up area under category B will require EC. With this major change in the clauses a large number of smaller projects went out of the ambit of the EIA from SEIAA.

Proposed EIA amendment January 2009

It is proposed to dilute the area criteria between state level and central ministerial level for EIA procedure. The Swaminathan Committee report on the EIA Notification 2009 expresses the amendment for certain projects. It is amending that the expansion and modernization of existing building scenario where expansion could be achieved without any increase in pollution load, land

and water use requirement or waste collection on existing site will not require EC. This is major concern for existing minor and major projects which would need expansion in future especially in coastal region leading great impact on coast. The committee recommends for no change in the previously amended EIA Notification 2006.

However, the fact remains that the basic level of environmental assessment at new building and township level, remained unnoticed and EIA tool does not ensure of human health and liveability aspect. This also means all these construction projects can happen without any robustness check for proper site selection/land use management for construction; energy conservation use/renewable energy or ECBC codes cannot be enforced; parking and entry & exit norms for the occupiers of the buildings/constructions cannot be verified; there is no compulsion to institute rain water harvesting and solid & hazardous waste management; guidelines for use of environment friendly construction materials and workers health; guiding principles for transport management during construction phase can be neglected; and no social impacts will be considered.

October 2009: The Committee set up to examine the amendments and the public submissions concluded that this amendment may be dropped.

What went wrong?

The proposed amendment had become extremely controversial. The officials in the Union ministry of environment and forests were finding it hard to defend this move.

Apparently, this draft notification that had moved in record speed as it did not undergo the full process of consulting various levels of advice that were normally sought from within and from outside the ministry before the draft was finalised. Reason for which is unknown.

All that it could say in its defence was its incapacity to handle large number of projects. The ministry blamed its own inability to handle the huge number of projects that were in the queue waiting for environmental clearance and the inability of the ministry to sit on a number of meetings and decide on these projects was time consuming process and an economic burden. So their solution was not to do anything and let the industry go without scrutiny.

Evidently, the ministry had caved in under the pressure from the major real estate industry especially those from the states of Haryana and Maharashtra. Not only the builders but key industry bodies including Federation of Indian Chambers of Commerce and Industry (FICCI) and Confederation of Indian Industries (CII) have also joined the chorus to insist on bringing in these amendments.

Implications of the proposed move

Following the proposed amendment the Centre for Science and Environment had assessed the scenario and the implication of this proposed amendment. What did it find?

If the new move to dilute EIA requirements came through then nearly half of the future growth (about 47 per cent) would go untapped by the EIA tool. An industry representative stated that according to the 2004 notification only 16.5 per cent of the 2009-12 demand area would be out of the EIA ambit. An estimated 22.2 percent of the demand would not need if the 2006 notification existed. But with the new 2009 notification almost half (nearly the size of Panjim city of Goa) of the demand would not come under the EIA ambit.

Even in the NCR which was leading the demand of real estate in commercial and retail sectors, the SEAC Delhi since its formation in November 2008 had to assess as many as 30-40 projects in the city with less than the 50,000 sq mts of built-up area or more than 20,000 sq m. A very few

Box

Highlights of the petition submitted by the construction group association

The draft concerning the EC outlines the issues of EC as follows..

Issues

1. There is inordinate delay in clearing projects at central as well as state level which is around 1 year currently
2. The outcome of the entire process is more or less standard order for all the projects mentioning Do's and Don'ts by way of conditions.
3. Each city has development plan which is duly vetted by experts and public at large, through process of suggestions and objections by public notices. Municipal corporations/planning authorities are responsible for environment control and pollution.
4. The municipal corporations/planning authorities have infrastructure and human resources to monitor projects periodically (regular site visits are conducted to issue approvals)

Conclusions

Standardised norms to be issued to all municipal and planning authorities to verify and lay down conditions for constructions while approving layouts and building plans to issue completion certificate on their verification of proper implementation of environmental guidelines.

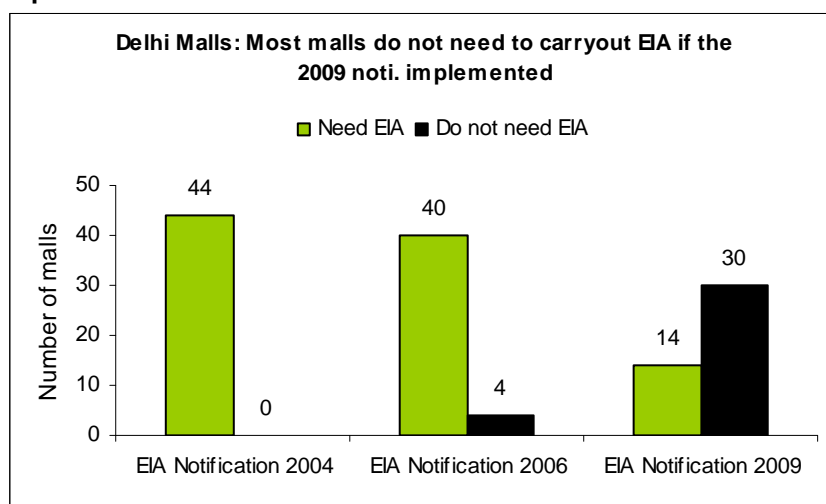
Suggestions

Instead of following a tedious & herculean task of submitting and getting Environmental Clearance from central/state government committees this task be delegated to municipal corporation/planning authorities giving them standard guidelines of implementing the environmental protection norms.

projects have more than the 50,000 sq mts of built-up area. Unfortunately, the area details of types of projects in residential, industrial and commercial areas are not publicly available. But the limited information for the retail sector -- the built-up area available for 44 malls in Delhi, shows that --- *Delhi tops the dodging with 51.4 per cent and 41.4 per cent out of the total 690 projects fall between the range of 20,000 sq mts to 50,000 sq mts and they will not be scrutinized by the EIA tool according to the new EIA 2009 notification.* If the proposed amendment had become a law, 30 malls would have gone off the EIA hook. All these malls fall under the built-up area specifications between 20,000 sq mts to 50,000 sq mts. This would have had serious environmental implications in the city.

Similarly, out of total of 132 commercial buildings in Gurgaon and Faridabad at least 67 percent needed MoEF's EC clearance according to the 2004 EIA notification. And only 42 percent needed the clearance according to the 2006 EIA notification. Now an even greater number may not require any scrutiny.

Graph 1



Source: Compiled from: Vinod Sakle 2008, 'Detail of Commercial/ shopping centres in Development Area of Delhi', response submitted by DDA to EPCA, May, *mimeo*

Table 1

Commercial constructions in Gurgaon and Faridabad form July 2004-May 2008

Notific ation	"Criteri a of Area in sq.m." for EIA	Criteria of investm ent (crore)	Criteria of People Capacity Holding	Criteria of Sewage discharge (kld)	Number of construc tion projects	Number of projects that needed EC from MoEF	Complia nce Needed as per law in %
1994	N.A	50	1000	NA	N/A	N/A	N/A
2004	N.A.	50	1000	50	132	89	67%
2006	20000 to 150000	NA	NA	NA	63	27	42%
2009	50000 to 150000	NA	NA	NA	??	??	??

Source: Compiled from: Anon 2008, 'Status of Environmental Clearances/NOC regarding commercial construction projects/shopping malls in Gurgaon, Faridabad', response submitted by DDA to EPCA, May, *mimeo*

Whiff of protests

The Ministry of Environment and Forests (MoEF) had proposed this amendment despite strong protests from its own body of state level appraisal committees (SEAC) and authorities that were responsible for clearing these projects at the regional level. In fact, the MoEF had held meetings with all the state level expert appraisal committees and the environment impact assessment authorities after the draft was released for public comment on January 19 2009. According to Professor C R Babu, chairman of the SEAC of Delhi, majority of the SEAC and SEIAA (State Environment Impact Assessment Authority) members and representatives had strongly opposed the proposed amendment and specifically the amendment related to building/construction.

Experts have also contested the industry claim of delay in clearances of projects and state that delay is not always valid. In fact the delay in obtaining environmental clearance is often caused due to incomplete information from submitted by the project proponents (See table *Myth of time delays*). An analysis of the minutes of SEACs meetings of selected projects shows clearances have been granted within the due time. Delays occur only when the project proponents do not submit full information or abscond.

Also information available from five other states show that the constructions projects assessed by the SEAC between 2007 and 2009 contradicts the claims by the CREDAI in their report to the PMO that getting environmental clearance is tedious and Herculean process. It is observed that the reason for 474 projects' awaiting environmental clearance out of 690 is due to the absenteeism of the project proponents for meetings and inadequate information submission during the meetings that lead to postponement of the finalisation (See table).

Myths and facts

Building construction industry has put out a host of objections to the EIA requirements in their petition to the PMO. Are these justified?

Developers' issue 1

Instead of following the tiresome task of getting the environmental clearance from the central and state level authorities the task should be given to the same state level authority like municipality or planning authority.

The fact

The ploy is to take the whole process out of the stringent provision of the EIA and the environmental governance structure of the country and stringent provision of the environmental acts. The entire process will be reduced to *ad hoc* guidelines that will be enforced by the local municipal authorities of states. Sources point out that the municipal authorities will have to be bestowed with powers to manage and enforce the environmental issues.

Developers' issue 2

There should be standard guidelines for implementing environmental norms.

The fact

EIA is a process to estimate each area's water stress and pollution, energy consumption and the stress on the area, waste management, air pollution level and then make sure that their levels of existence are not against the possible construction's emissions besides the EIA process also estimates the resource uses by the possible construction and checks against the available demand of the respective natural resources in that area within the city.

Hence it is impractical for setting an established set of standards for such projects. All this highlights that MoEF might not have assessed the above mentioned points or it is merely ignoring the fact and accepting the terms of the industry for their convenience. Establishing SEIAA and new set of standards and norms relieves less control on construction activities since there is already existing corruption in this mechanism to get EC to fast-track the projects. The weakening

of systematic environmental clearances procedure due to transition through central to state node will only help state level private developers since they are influential in political area where the project proponents apply for most clearances and this would possibly underestimate the environmental risk and air pollution.

Therefore, EIA as mandatory tools having its standards and norms as par to the best practices becomes absolute necessarily. This is also important in order to monitoring report and bring best practise in construction projects through outreach activities in public interest. Publicly setting proper environmental assessment practices for positive outcomes of socially significant projects and ultimately improving the liveability aspect for sustainable urban development policies.

Developers' issue 3

Issue of time taken for granting an environmental clearance by the MoEF or the SEAC terming it as a tedious and Herculean task

The fact

A preliminary review of the entire clearance process shows clearly that most of the time delays are caused because of incomplete information provided by the developers themselves and for not following the rules completely at the time of making applications.

The EIA regulation states that environmental clearance for any construction is deemed approved after 60 days if the developer does not hear from the EC granting committee since the date of submission. It is also evident that if the acceptable documentation and evidences are submitted to the EC granting committee the time taken to process should not take more than 3 to 4 months.

Earlier when the cases were considered only by the MoEF i.e. before the formation of SEAC & SEIAA the time taken to consider a project could take 6-8 months. This has been considerably reduced after the regional authorities were created. (*Table 2 highlights some projects and their details from minutes of meetings of the respective state SEAC meetings*)

The green building team in CSE has tracked the process of clearance of some projects to ascertain the key reasons for delay.

Table 2
Time delays can be a myth

State	Project details	Date of project presentation & details asked	Date of 2 nd meeting	Date of 3 rd meeting	Time taken to obtain an EC in days
Delhi	Aggarwal plaza, Shahdara, 31,897.665 Sq mts	Dec 29 2008 proponent was asked furnish Details of water requirement and waste water generated; Management plan for the STP and sludge disposal; Permission for use of borewell from CGWA; Details of Solid Waste Management Plan; Disaster Management Plan; Details of landscape development and Environmental Management Plan	Jan 30 2009 SEAC considered the project and recommended for an EC	N/A	30
Delhi	Commercial Complex, shalimar bagh, 27265 sq mts	Dec 29 2008 proponent was asked to furnish Location map, layout plan showing different units and designs of the building; Details of management plan for sewage and solid waste; Agreement with the CPCB empanelled recyclers to who used	Jan 30 2009 proponent did not attend the meeting	N/A	project proponent did not attend

		oil from DG Set will be sold as hazardous waste and Disaster Management Plan			
Haryana	Expo mall, Panipat, 26734 sqmts	July 16-17 2008, proponent was asked to furnish detailed master plan, hydraulic design, water supply permission from concerned authority, revised water harvesting plan, dual plumbing system plan for recycling water, reports of air, water, soil and noise, dispersion model of ambient air quality, electrical hazardous plan, list of energy saving construction material, detailed Environment Management Plan, health and medical plan for worked	Sep 25-26 2008 required documents were submitted and recommended for an EC	N/A	90
Karnataka	Touchstone commercial complex, Salarpuria	Aug 10 2007 proponent was asked details of Information on employment of environment/safety officer, details of labour colony and sanitary facilities, details of excavated and debris disposal from construction, details of water source and quality for construction and operational phase	Aug 25 2007 due to proponent's new claims they were asked to submit documents related to the claims	Oct 15 2007 was granted EC by SEIAA	60

Source: complied from State Expert Appraisal Committee (SEAC) & State Environmental Impact Assessment Authority (SEIAA) meetings of Delhi, Haryana, Karnataka from 2007 to 2009

Table 3

Construction projects applied for EC to SEACs from 01/2007 to 02/2009

States & period	Total construction projects	No. of projects granted EC	No. of projects' EC pending	Projects that have built-up range between 20,000 to 50,000 sq mts (out of EIA gambit)
Delhi 12/08-02/09	35	12	23	18 (51.4%)
Maharashtra 06/08-03/09	83	N/A	N/A	N/A
Haryana 05/08-02/09	189	39	150	71 (37.56)
Karnataka 01/07-12/08	243	81	182	110 (45.26%)
Tamilnadu 04/08-11/08	140	34	119	44 (31.4)

Source:

- Compiled from the Delhi SEAC minutes of 3 meetings 2008-09
- Compiled from the Maharashtra SEAC minutes of meetings 2008-09
- SEIAA Haryana, 'List of Construction Projects', 2008-09
- SEIAA Karnataka, 'List of Construction Projects', 2007-08
- SEIAA Tamilnadu, 'List of projects 2008'

Loophole

The case of Environmental Clearance for Residential project, *Janta Township, at Sector.90-91, Mohali, Punjab by M/s. Janta Land Promoters Ltd:*

As presented by the project proponent, the proposal involves the development of township on an area of 120 acres which included plots, group housing, schools, dispensary, community centre and commercial area for a population of 16,000. The project was covered under EIA Notification 1994 as amended on 2004. The project was submitted to the Ministry for Environmental Clearance. During that period, EIA Notification was amended on 2006. As the project area initially was less than 50 ha, it was exempted from environmental clearance in February 2007 and the project proponent started the development work.

However, in June 2008, project proponent acquired adjoining 18.35 acres (total area became 138.35 acres-56.05 ha) and applied for environmental clearance to SEIAA as the project area exceeded more than 50 ha. The project was appraised by SEAC, Punjab in various meetings and recommended for environmental clearance. Later, the SEIAA of Punjab asked to re-examine whether the project can be allowed to discharge its waste water into adjoining river water to which permission are granted by PPCD vide. Further the project proponent was asked to submit a revised water balance chart used of treated waste water, type of industries located within 5000 meters from the boundary of the project and provide dual plumbing system in the project. They were also asked to submit details of air quality monitoring.

The overall impact assessment was very fragmented in nature. Therefore, the actual environmental stress due to such projects gets unnoticed. Also, there is unreliable account of the data of actual number of buildings constructed and eligible projects scanned under ministry's EIA tool. The developers do not apply for environmental clearances for entire project at one go and split the project to keep each phase below 50 Ha.

Why worry about the real estate industry?

The real estate sector is expected to grow phenomenally in the near term. Its growth is closely linked with the economic growth. The real estate consultant the Cushman & Wakefield have estimated in their report that the construction industry is 9.8 percent of the GDP and India is ranked No two in Global Retail Development Index 2008.

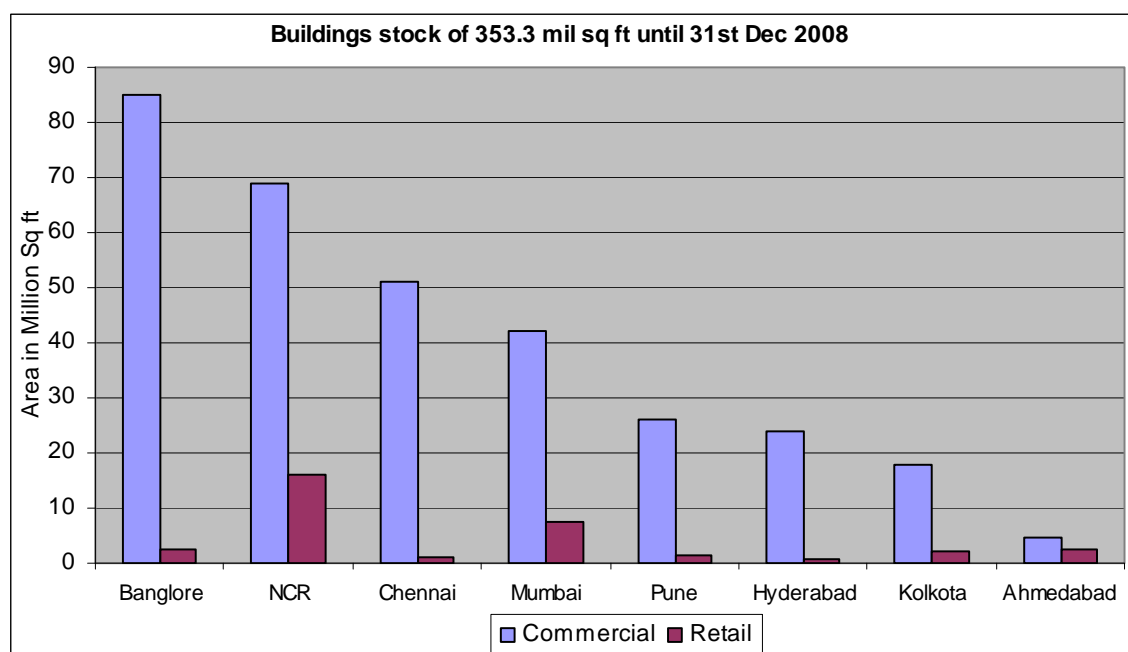
Unfortunately, there is very little official estimates and statistical data available for the real estate industry. Though the income tax, land revenue, urban development, and the environment and forestry department do have the data of all the applicants who have applied respective approvals for projects but, a compiled facts and figures data bank is not available with the government. Rationally, the sector is not recognised in the books of the government. Reasons are unknown.

In the absence of official data the estimates available from some real estate service providers, investment banks, and research foundations have become the principal source of information for this sector. This is a very opaque industry. According to the Leonard Sahling, Head of Research, ProLogis a globally leading distribution facilitator in the US, "No one in the commercial real estate business, in my opinion, does a better job of compiling accurate, reliable real estate market statistics", this also suggests the concealed behaviour of the private construction industry and the businesses.

There is a collage of fragmented data on the existing built up areas. According to IBEF (Indian Brand Equity Foundation) the year 2006 stock of commercial office space in India was 45 million Sq ft and retail space was 19 million sq ft. However, 'Cushman & Wakefield' a global real estate solution provider also based in India has come closest to providing some comprehensive data

say that the total built-up area existing in 8 major Indian cities until 31st Dec 2008 is 353.3 million sq ft (nearly 33 sq km) of which commercial office (micro markets) is 319.5 million sq ft and the retail part is 33.8 million sq ft. (details in Graph 2). But these disparate data do not allow comprehensive assessment of the total area affected by the real estate development.

Graph 2



Source: 2009 Cushman & Wakefield, Mimeo

Cushman & Wakefield estimates the future projections in potential demand in real estate development over the next five years in the country, 2008-2012. The pan India demand across office, residential, retail and hospitality segments is expected to be about 1098 million sq ft. This demand is also expected to be very concentrated in just a few mega cities of India. Almost 80 percent of the projected demand (878 million sq ft) account to 7 major cities in India (see graph 3) NCR (National Capital Region) of Delhi, Bangalore, Mumbai, Pune, Hyderabad, Chennai, and Kolkata. Among which cumulative commercial and retail sectors account for 284 million sq ft.

The 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 and 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.

The report also estimates that pan-India cumulative demand projection for real estate sector for 2008-2012 is 1,098 million Sq. ft (built-up area). In other words it sums up to 101.94 Sq. Kms

which almost one tenth of the area (1483 sq km) of New Delhi city or nearly 3 times (36 Sq km) of Panjim city of Goa. It amounts to adding a whole new city to the country.

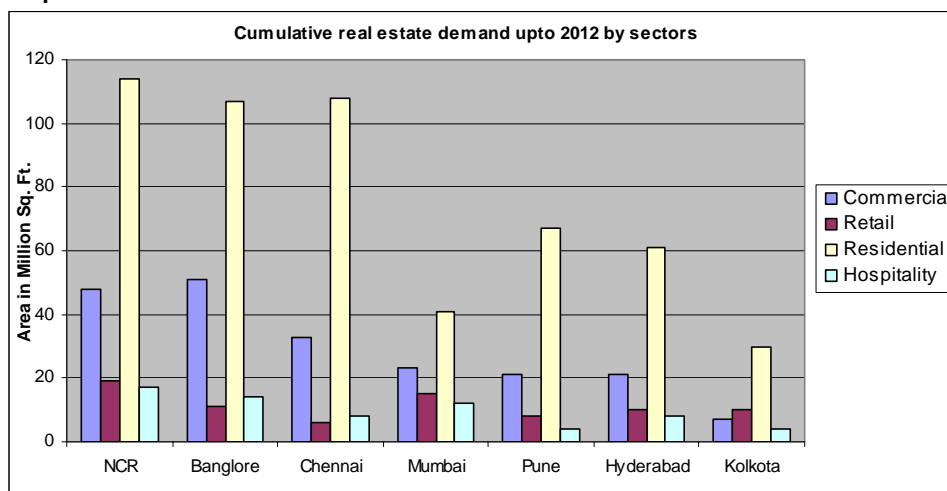
Table 4: Projected demand in the real estate sector

Pan-India real estate demand area in million Sq. Ft.				
Year	Residential	Commercial	Retail	Hospitality
2009	132	47	18	14
2010	136	48	19	14
2011	142	50	20	15
2012	152	54	22	16
Total	562	199	79	59
Total of 899 million sq ft				

Source: 2008 "The Metamorphosis, changing dynamics of Indian realty sector" May

The residential segment dominates the future demand at 63 per cent. Despite the economic slow down the office demand will be around 22 per cent, hospitality demand 9 per cent and retail demand 6 per cent (See *table 4 projected demands in the real estate sector*). Retail sector will see prolific growth. With the share of organised retail likely to increase to USD 30 billion by 2010, as per the Ernst & Young, retail expansion will be phenomenal. In fact NCR will hog 20 per cent of the future demand and Mumbai about 16 per cent. But the rate of increase will be very high in Hyderabad, Chennai and Bangalore.

Graph3



Source: 2008 'The Metamorphosis changing dynamic of Indian realty sector', September

Table 6

Projected demand area (million sq ft) that will not need EIA or EC according to the EIA notifications in India from 2009										
EIA notifications	Residential (562 m sq ft)	%	Commercial (199 m sq ft)	%	Retail (79 m sq ft)	%	Hospitality (59 m sq ft)	%	Total (899 m sq ft)	Total%
2004	28.1	5	29.85	15	11.8	15	8.85	15	148.8	8.7
2006	56.2	10	49.75	25	19.75	25	17.7	25	199.6	16
2009	84.3	15	129.35	65	55.3	70	23.6	40	420.8	32.5

Source: estimates on the basis of data from, Sep 2008 "The Metamorphosis, changing dynamics of Indian realty sector"

Table 6 illustrates the effect of EIA notifications on the estimated demand space sector wise. And there is clear indication of dilution of the system. The estimates are based on discussions with industry experts.

Environmental concerns

Energy, water and wastes are the key impacts of buildings that have serious implications for resource security, local pollution and also climate change. The real estate sector concentrates demand for all basic resources – water, energy, land greens, and waste disposal, and is expected to have very big environmental footprint. This aggregate impact has not been estimated for India though the Indian Green Building Council claims that buildings in India consume more than 20 per cent of electricity used in India. Globally, environmental experts confirm that buildings throughout the world account for 60 per cent of energy use and 40 per cent CO₂ emissions.

The energy demand for the projected real estate space that is expected to emerge by 2012 will be around 10,788 MW which is double the present energy demand of Delhi city. The water demand will be at 3,596 MLD (million litres per day) which equates to present supply of Delhi city.

A report on 'people, planet, profit: property' 2007 by Jones Lang LaSalle a real estate solutions provider stated "Commercial buildings can account for as much as 50 percent of all energy consumed within an economy, with air-conditioning and office equipment accounting for the majority of the end-use energy. It also accounts for significant carbon dioxide emissions and can use as much as one-third of all the water consumed within an economy. Asia Business Council states that a modern 18 story building in Singapore or Hong Kong is equal to 900 cars.

The Bureau of Energy Efficiency (BEE) estimates in its report of 2006 that very conservatively the estimate of real estate for India is approximately 55 million Sq ft per year in 2008. According to its report in 2006, 116 billion residential units consume 23.4 per cent of the energy and the 33 billion commercial units guzzle 6.6 per cent of the country's consumption. This clearly makes a case for strong conservation efforts.

The Union Ministry of Urban Development estimates that with a near consistent 8 percent rise in annual energy consumption in the residential and commercial sectors building energy consumption has seen an increase from a low of 14 per cent in the 1970s to nearly 33 per cent in 2004-05. This enormous appetite of energy emanates from the needs of lighting, cooking, space conditioning, refrigeration, water heating among others in all kinds of buildings. There is a variation in the pattern of demand for electricity in the residential and commercial sectors. In residential sector space conditioning, refrigerators, geysers, and lighting use the maximum electricity. In Delhi during summer months this could be nearly 52 per cent of the electricity consumption.

In the commercial sector 60 per cent of the total electricity is consumed is accounted for by air conditioning followed by 20 per cent for lighting. The MOUD states in its proposal for sustainable Habitat that with a 10 per cent increase in the net built up area in residential and commercial sector annually and a large existing stock of buildings there is a need to integrate energy efficiency with building designs and operations.

It is said that typically the average energy consumption of inefficient buildings is around 200 units per annum per sq meter. But energy efficient buildings should not consume more than 120-160 that shows there is a potential saving of around 30 to 35 per cent. In fact according to the estimates available from the Bureau of Energy Efficiency that is responsible for 50 per cent of the energy savings.

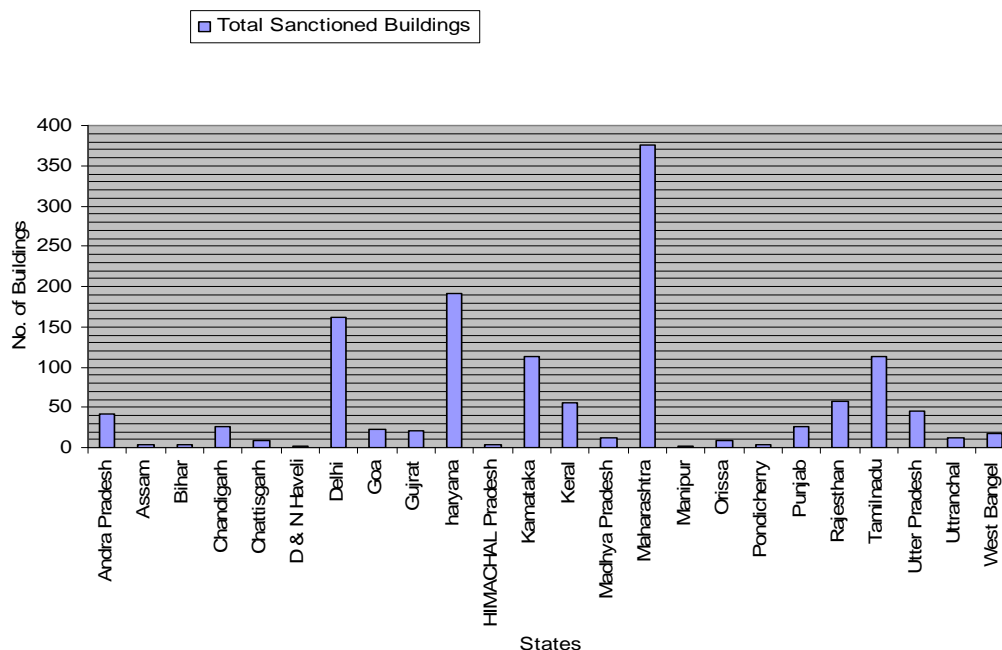
32.5 percent of the estimated real estate demand for 2012 will not need EIA or EC according to the 2009 notification. (Table 6) 70 percent of the retail and 65 percent of the commercial sectors escape the EIA ploy following the hospitality sector

This brings out the importance of regulatory tools in reducing the resource imprints of buildings. EIA presents that opportunity if designed well.

What is missing from our EIA tool and the process?

Environmental management of the buildings is seen as one of the most powerful tools in reducing demand for resources and the environmental footprint. EIA is one of the proven management tools for integrating environmental concerns in development process and for improved decision making. Unfortunately, the successive dilution of the EIA provision to a mere formality of forms (Forms 1&1A) that requires submission of minimal details on resource consumption and conservation practices renders it as very ineffective and weak.

Graph 4: EC Granted for New Construction Projects as per EIA 2006 (Till Nov. 2010),



Source: Ministry of Environment and Forest)

The present EIA tools misses out the accountability aspect while maintaining data management over various resource consumption, fresh water requirement and waste water recycle quality

standards, sewage treatment facility, rainwater harvesting and importantly energy consumption/m²/year in actual new built up space in the country. The high rate of urbanization also makes it important for robust EIA and subsequently assured EMP for post construction phase.

Even though a more decentralised institutional mechanism has been set up for evaluation of the projects the system is not rigorous enough to make a difference. The SEAC and SEIAA were constituted by the MoEF for all the state governments (except Mizoram, Bihar, Assam, Kerala, Nagaland). Though this has helped to intensify the scrutiny of projects by the committee members than what it used to be when it was centrally controlled by one single ministry at the centre, it is still not as effective. The committees often direct related authorities to inspect the relevant projects based on the claims in Forms 1&1A. Stress on authorization from the providers of water and energy were insisted upon.

Yet, resource intensive construction projects are proliferating in the cities in complete disregard of the carrying capacity of the neighbourhoods and often without the proper permissions from the regulatory authority. EIA in its current form is only a feeble check. Many constructions are operating in complete disregard of the environmental concerns.

The EIA implementation is a bundle of gaffes. Firstly, and most important site screening is missing in the present form of EIA tool. Site screening is a process where the planned project assessment with the site selection and the environmental impacts are summarized. So as a reason a choice of sites is selected and compared with least environmental effects. The least effective is selected and proposed. And the respective authority double checks with the claims made and a decision is made based on the intensity and the importance of the project. But this process is totally lacking the present EIA form.

Next is the process cumulative assessment of the area where the project is planned, the effect on the demand and supply of resources is assessed. There should be a concept of involving the local resource provider (mainly electricity and water) to assess if the new buildings can be added in view of the resource stress and the carrying capacity of the locality. It should be assessed whether the area is in a position to take up the demand of the resources proposed by the new planned project. And this should be confirmed with the local authorities and the resource suppliers. This will need the camaraderie between the environmental authorities and the local authorities. But this is also lacking in the process.

Even a cursory review of the project proposals show that the project proponents only mention the water and energy needs of the buildings. For estimating they follow the basic principles of the guidelines of the Bureau of Indian Standards that help to estimate the water demand based on per capita consumption. But this is not backed up by any assessment from the water and electricity providers to show if they can supply the requirement. Field visits to the shopping malls in Saket in South Delhi shows that three malls are operating in the area with no electricity and water connection.

Many shopping malls and commercial complexes in Delhi have actually come up without the mandatory requirement of the no-objection certificate from the state environment department. Recently the Delhi Pollution Control Committee has imposed penalty on the malls for environmental damages -- for operating without environmental clearance. Not only that many malls were found withdrawing ground water in violation of the rules. Delhi Jal Board is not in the position of meeting the full water requirement of these complexes. Hence they resort to boring. Recently among the 76 malls issued notices by the DPCC most of them were penalised for extracting ground water without any permission from CGWB (Central Ground Water Board).

These commercial complexes do not have adequate electricity supply and depend on diesel generator sets to meet their power requirement. In fact the three malls in Saket have not been able to obtain electricity connection. They depend on generator sets for 24 hours a day.

Subsequently, another important element is waste management including the hazardous, solid and sewage. This too involves the area's capacity and the load on the existent capacity of the respective elements. Project's waste disposal declarations should be assessed with the current levels and confirmed and obtain the judgment of the local municipal authorities. The project's

The case of a shopping mall in Saket

Name of the Mall MGF Metropolitan, Saket

A cursory review of the malls in Saket brings out the adhocism of the environmental management in these buildings.

The mall has a built-up area of **31,531.26** sq mts. EC was granted by MoEF and since its operation in early 2008 the operational part and the some facts of the mall are as follows:

- Mall runs on diesel generators 24 hours as they do not have any electricity connection from the local electrical supply authority.
- The mall does not have a water supply connection from the local water supply authority. The reason is not known. As a result the mall gets its supply of water of 100 KLD.
- It does not have a sewage connection as well. So there is absolutely no clue of where the sewage is being discharged.
- It does have a STP (Sewage Treatment Plant) in the basement. The STP holding capacity is 100 KLD. But only 10KLD is being generated and treated in the plant. There is no indication of the use of rest of the water and the sludge that is generated by the STP.
- The MCD (Municipal Corporation of Delhi) does not manage the solid waste of the mall. The mall claims that a private agency manages their solid waste.
- Though the mall has parking spaces for 436 cars most of the cars were found to be parked outside the mall near the entrance.

Now the striking issue is that all this happening even after the mall has conducted an EIA and the MoEF has granted the EC based on the claims made in the EIA report. Reason, there is no monitoring of the EMP claimed by the project in the EIA report.

mitigation measure for the waste management shall be assessed with the current situation. This will assess the project's influence on the environment and pollution load. It is also not clear from the field assessment of the water treatment facilities are designed to meet the full treatment requirement and whether these are operated as planned. Post project monitoring is very poor.

Similarly, in the EIA process the traffic impact of the projects is totally ignored. Even though the buildings are expected to follow the developmental norms that specifies parking spaces per 100 sq m of built up area the regulations do not assess how the new projects especially the commercial and office spaces will induce more traffic in the area and increase the traffic volume in the key arteries beyond the designed capacity of the roads. This then adds to congestion and pollution.

EIA manual provides the guidelines for the maintaining the health of workers involved in the project, traffic management during and after construction, use of DG sets and water and energy conservation to be followed by the projects. All the mitigation mechanisms to be taken should be presented in the form of EMP (Environment Management Plan) which is part of the EIA and mandatory. But this process is merely a paper work and not monitored. Therefore, a strong monitoring component should be followed for an effective mitigation of environmental damage.

Fragmented approach

The EIA should have been the central organising factor that can help to address each aspect of the resource use in an integrated manner and also weave the requirements of other regulatory and voluntary provisions on green buildings devised by other agencies. Unfortunately, the existing policies related to building byelaws are complex and divided between many government departments at both state and central levels without any coherence between the building byelaws and building resource conservation policies.

The current approaches to managing environmental impacts of buildings are very fragmented. EIA is implemented by the Ministry of environment and forests. On the other hand, to promote energy conservation the Ministry of Power has prescribed Energy Conservation Building Code (ECBC) that set minimum performance standards for buildings and labels for electrical appliances based on energy efficiency. Union ministry of urban development enforces the National Building Code 2005 that also has provisions on energy use. In addition to this there are a range of voluntary rating programme for buildings that has been initiated by different agencies including the Confederation of Indian Industries' GBC (Green building Congress) that follows the USGBC rating system "LEED" (Leadership in Energy Efficiency Development).

Ideally, EIA should be the centralised tool with strong interface with all these systems to make the approach more comprehensive and complementary. But all these systems work in isolation. BEE has developed the ECBC for buildings in February 2007 and is wholly voluntary. But the Delhi government in late 2008 have taken the step of involving the ECBC into the building norms as a mandatory set to be followed for the Delhi region. It is unknown the extent of its success. ECBC's elements are Building envelope (walls, roofs, and windows), lighting (indoor & outdoor), heating ventilation & air conditioning (HVAC) system, solar hot water heating and electrical systems. A national bench mark is set at 180 kWh/m²/year and an ECBC compliant building is 110 kWh/m²/year. If EIA and the ECBC worked in a more integrated manner this benchmark should have got translated into an EIA provision.

Similarly, in a parallel process the National Building Code (NBC) 2005 has been developed by the Bureau of Indian Standards to guide municipalities and development agencies to ensure the compliances over building bye laws. The NBC 2005, include aspects of energy conservation but does not cover the technical aspect of building design elements. This largely focuses on daylight integration for lighting, ventilation standards, electrical standards etc. The Energy Conservation Building Code 2007, mentions about mandatory requirement for the Natural ventilation compliance with the design guidelines provided for natural ventilation in the NBC of India 2005 Part 8, 5.4.3 and 5.7.1.1

While NBC is not integrated with the ECBC, both ECBC and NBC are not integrated with the EIA tool. This is the greatest weakness of the current regime. Further to the notice, every regulatory tool, ECBC, NBC and EIA does mentions about the prescribed norms and standards in their notifications, but the project proponents does maintain the void gap for accurate compliances. The both ends, regulatory mechanism and project developers, fairly integrate to respond effectively to environmental policies or energy efficiency trends and consumers always pays the high cost without realizing the actual benefits of its investment.

Steps towards green buildings

As a result of this fragmented approach the application of green elements in buildings is partial and segmented. Adoption of any sustainable practices – rain water harvesting system, solar water heating systems, or energy efficiency measure, -- in isolation or together sums up the green building movement in India. Currently, these are being largely pushed by voluntary programmes on green building. This is getting impetus from the voluntary measures and government financial incentive programmes for such practices evolves (See boxes. *Voluntary efforts* and *Incentive programmes for green buildings*). But there is no central organising legal framework that will push buildings to adopt sustainable practices to reduce its resource imprint throughout the building's lifecycle.

There is no proper assessment of the actual figures of the green buildings or buildings that some conservation elements. It is a loose label that is used to cover that has some green elements but may not pass the muster of a full blown green building benchmark. According to Indian GBC there are various figures of green foot print that range from 10 million sq ft to 110 million sq ft until the period of 2008.

Table 07: Total Construction and Green Building Built up for 2010,

Projected Construction Growth by 2010	
Area in Million Sq. ft.	
Total Building Built-up	915
Construction (Comm + Resd) 2010	436.464
LEED Rated	5.898
GRIHA Rated	8.627
BEE Star Rated	7
Total Green Built-up	21.025

Source: CSE Analysis on BEE, IGBC and GRIHA, website

Voluntary programmes are largely based on a rating system to encourage fast uptake of sustainable practices. Confederation of Indian Industries' GBC (Green building Congress) follows the USGBC rating system "LEED" (Leadership in Energy Efficiency Development). CII's GBC centre in Hyderabad is the first to go green. The building is built with fly-ash bricks, has an extensive rain water harvesting system, bed based sewage treatment facility, 25 KW capacity solar panels and a garden insulation for cooling the building from extreme heat. The building is designed to make use of the natural air flow so certain extent.

State governments have also begun to carve out fiscal incentive programmes to encourage buildings to adopt efficiency measures. Pune and Mumbai have taken a step forward by initiating the process of making a greener home in 2008. The green rating system of the residential sector comprises measures that cover the factors like site selection, environment architecture, efficient building materials, energy conservation and management, water conservation, segregation of waste etc. The local government is involved in developing an incentive scheme to the builder going green and to the consumer for choosing the greener home. This is best example of local

authorities' involvement in the practice of green building. This rating process has all the important rudiments of an EIA and the environment management plan (EMP) practice. Yet, this practice sidelines the aspects of area screening, worker's health management and traffic management which are part of the EIA.

Implementation of the elements of the green building remains minimal and elementary. All buildings virtually remain without a composite environment management plan that can be monitored.

Box

Voluntary efforts

Voluntary schemes have begun to emerge in the country to reduce the environmental footprint of buildings. The key thrust is on energy and water. Some key initiatives include:

IIT Kanpur's building stands in compliance with ECBC codes. The walls are cavity insulation, roof is insulated and shaded and have a double glazing and shading for its windows. The lighting fixtures are energy efficient and daylight integration is used for minimal or no use of lights during the day. Efficient chillers and coolers are used with geothermal energy. The EPI (energy performance index) of the building was reduced from 240 kW/m²/year to 98 kW/m²/year.

BEE claimed that a nationwide implementation of the ECBC will yield a saving of 1.7 billion kWh in 2007-08.

Biodiversity Conservation India Ltd has created numerous eco housing projects for water and energy conservation and waste management in and around Bangalore city. Their residential projects ranging from 300,000 sq ft to 1 million sq ft have demonstrated successfully the effect of such schemes. Their Tzed homes residential project has helped to secure carbon reduction of about 22000 tonnes at the construction level with further annual reduction of about 7000 tonnes. This was possible with the help of application of 48 different systems. By selling these CERs in the carbon market they have economised the project or have shared with the customers on a monthly basis to subsidize operation and maintenance costs.

Incentives for renewable energy technologies for buildings: The Union ministry of New and Renewable Energy is promoting solar water heating for various classes of consumers through a scheme of loans with nominal rates of 2 to 5 per cent, capital subsidy for developers and incentives to municipalities for the amendment of building byelaws of rebate in property tax or electricity tariff. Another scheme includes rebate in registration fees to the extent of 90 per cent, also fiscal incentives to architects and designers, and incentives to local urban bodies that announce rebates in property tax for green buildings. Solar water heating system is fast catching up in urban areas such as Bangalore, Pune, Hyderabad, and Mysore.

Solar water heating systems in Magarpatta housing complex, Pune: Magarpatta is one of the biggest housing complexes in India covering 550 acres. Solar water heating systems are fitted as amenity to the houses and flats. There are about 3194 solar collectors in all residential neighbourhoods comprising about 3500 flats. This place will have at least 10,000 flats and houses. The total current installed capacity is 4,03,150 litres per day and the saving of carbon emissions is 6047.25 tonnes per year. The electric unit saved per year is 68.94 lakhs Kwh. The ultimate savings in carbon emissions will be 13483 tonnes per year.

Solar housing complex in Kolkata: The new town area of Kolkata city has been set up by the West Bengal Renewable Energy Development Agency with partial support from MNRE. The houses have been designed based on solar passive architecture and integrated with solar water heaters and photovoltaic modules. Swimming pool is planned to be heated with solar energy. Roads have solar street lights. Houses have energy efficient electrical appliances. There is 8 kw Roof top solar PV system which is grid connected. Solar PV operated name plate and signage, among others. This is based on the concept of Zero use of conventional electricity.

Thane Municipal Corporation: TMC has mandatory solar water heating system for all new and existing buildings except for residential plots. But residential building owners are entitled to 10% rebate on property for having a solar water heating system.

Rain water harvesting: In 2004 Kerala govt. issued guideline for mandatory rain water harvesting for all new constructions. In Madhya Pradesh rain water harvesting is mandatory for all new buildings with an area of 250 sq m the government has introduced an incentive of 6% property tax rebate for implementing the harvesting mechanism. In Andhra Pradesh too it is mandatory for all buildings measuring 300 sq m. In Tamilnadu it is mandatory for all buildings new and old. Moreover the government warns citizens that the regular water supply will be disconnected if a proper rain water harvesting system is not found in the premises. Haryana has it mandatory for all buildings irrespective of area. Rajasthan has it for buildings with 500 sq m in urban areas. Maharashtra has it mandatory for plots with 1000 sq m in size. Gujarat has it mandatory for all government owned buildings only.

Ministry of Housing and Poverty Alleviation has made rain water harvesting mandatory for all new buildings with roof area of 100 sq m and all plots with a area of 1000 sq m that are being developed. CGWB (Central Ground Water Board) has made rain water harvesting mandatory for all institutions and residential colonies in south and south west Delhi and also in Gurgaon, Faridabad and Ghaziabad.

Sewage Treatment plant: In 2008 Uttar Pradesh government has made it mandatory for all new housing colonies to have a STP and directed the district development authorities to ensure the installation.

Box

Incentive programmes for green buildings

Urban local bodies offer incentives: city governments have begun to give incentives for green buildings. Municipal corporations of Rajkot, Nagpur, Pune and Mumbai offer property tax rebates to implement certain good practices like the solar water heating. GRIHA awards 1 to 2 lack Rupees to architects, engineers or planners for adopting to green building practices and bringing energy efficiency in their building design. The BEE has also came up with star rating system for its commercial IT/ITES and BPO buildings and awards additional incentive mechanism for utilizing energy conservation building codes.

Eco housing programme of Municipal Corporation of Greater Mumbai: MCGM Eco housing programme encourages developers to adopt eco housing assessment criteria to certify the environmental performance by their residential projects. The criteria include site selection, environmental architecture, efficient building material, energy conservation and management, water conservation, segregation of wastes among others. Validity of eco housing certification granted by MCGM is 5 years after which the certification will have to be renewed. Random checks is carried out by the Eco Housing technical cell to ensure the all the systems installed are working properly. Incentive is given by way of rebate in development charges, and assessment tax.

Property tax rebate for green building: In Sep 2007 Andhra Pradesh government introduced 10% tax rebates for buildings and individual houses who will incorporate green building initiatives. It also provides tax discounts for the buildings rated by CII's GBC.

Tax rebate for rain water harvesting system: Madhya Pradesh government provides 6% tax discount to all the plots that have a rain water harvesting system.

Regulatory best practices: Learning from others

Green building regulations and EIA have evolved to more sophisticated level in other parts of the world. In UK, EIA is conducted before the planning of the proposed projects. After the planning proposal is submitted to the respective authority, the project's importance to the community and the strategic environmental impacts are assessed in advance so that the proponent gets enough time to plan the project in another feasible area.

Besides the EIA the SEA (strategic environment assessment) form of process exists in specific cases where there might be proposal for a development in environment sensitive or resource stressed area. A SEA is the form of environmental assessment intended to identify and assess the significant effects of a plan or a project on the environment and the results are taken into account. It scrutinizes the environmental effects of a specific project specifically and can be applied to larger projects.

For the retail developments the practice of "Retail Impact Assessment" is followed in UK and Republic of Ireland. Retail impact assessment or RIA is a means of establishing the potential commercial impact of a proposed new retail development on existing and committed retail developments and that has a planning permission. This process can assess the impact on the unorganized retail segment in that specific area of development the local public.

In Japan, need of an EIA for a certain projects like constructions is decided by the concerned environmental authority after considering the importance of the project and the intensity of the environmental damages that might be caused by the project.

In Canada a process called "*principal project/accessory test*" is followed for small scale projects where the importance of the project is assessed with the impact on the area, site and people involved where it is proposed and the consultation with the regional authorities is considered and a decision is based on the result of the assessment on all the above aspects.

In the US the National Environment Policy Act and related state laws require public agencies to analyze and disclose environmental effects and the effects on human health from the all the development projects. This process is part of the EIA tool in the system.

Way ahead

Letting off a large part of the building sector from EIA screening can spell disaster in cities that are extremely resource starved and already have big ecological footprints. Not only the large part of the building sector should be brought within the ambit of EIA, the EIA provisions should also be reformed to make them more effective. Currently, a variety of tools and building bye laws are available in a disparate manner that promotes green elements or sustainable practices but these do not help to create the composite framework for green buildings. The current regulations, building codes, and the green rating satisfy the requirement of an EIA and environment management plan to a minimal degree.

The major issue regarding the EIA notification 2009 allowing state appraisal committee to issue environmental clearances for mostly new construction project, more than 50 Ha of built-up area, requires reconsideration with regards to its quality standards and norms for energy, water, waste and land-use pattern. This is vitally important as far as national mission for sustainable habitat is concerned in order to adopt and make it feasible for planning of large and small scale urban development through mandatory compliances of various environmental voluntary institutes (*BEE, NBC, GRIHA, IGBC etc*). When multiple initiatives are being taken to conserve water and energy and to minimise wastes in the building sector, EIA process should be integrated with the other regulatory initiatives. EIA should be harmonised with the ECBC rules, energy audits, building certification, NBC byelaws, and rainwater harvesting rules, compliance with solid waste management rules, and all other aspects of environmental management. Only this can help to

prevent gregarious resource use in the building sector and minimise negative environmental impacts.