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Business Case for Green Buildings in India

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Green commercial buildings have been an emerging trend in India cities over the conventional building for more than a decade now since LEED rating systems came to India in the year 2001 in partnership with CII-IGBC. This paper attempts to explore if incremental costs of building green do result in tangible benefits during the life cycle of green building. Indian cities have been engines of growth with more than 60% of GDP contribution which is expected to increase to 75% by the year 2030. Services sector has been a major contributor to the GDP in cities which needs Commercial real estate. Our cities have resource challenges with commercial energy shortage, water demand supply imbalance, significant increase in solid wastes that a building generates and hyperinflation in the price of building materials because of resource-supply challenges. Green buildings globally are considered resource efficient and environment friendly. The green rating systems in India and all around the world claim resource and environment efficiency of green rated buildings but more evidence based research is needed. This papers uses qualitative approach using secondary data analysis and exploratory interviews with green consultants, architects and developers to access if building green has tangible benefits or not. This basic classical ethnographic research method involved secondary data analysis, field visits and conference visits where unstructured interviews were conducted. The paper finds out that green buildings though comes out as resource efficient over conventional building but tangible benefits needs further evidence based research in terms of rental premiums, occupancy rates and energy efficiency savings. There is lack of data for doing quantitative research in this area and this paper recommends data collection and analysis of green vs conventional buildings in the same location. The data collection, analysis and deduction can help validate weather green buildings bring tangible benefits compared to conventional buildings.

Keywords: Green rated building, resource efficient, tangible benefits, incremental costs.

INTRODUCTION

Buildingsareresponsibleformorethan30%CO2emissionworldwideleadingtoclimaticchangesandlookingatrapidurbanizationinIndia;itissettobecomeworld'stoptwoCO2emitterbytheyear2030.AnotherfacetperPlanningCommission,GovernmentofIndia,Indiaexperiencedcommercialenergyshortageof41%in2012.Wealreadyhavewaterdemandsupplyimbalancewhichwillreachto50%by2030ifnothingisdoneperMcKinseyreport.Solidwasteincreasedby50%in2011overthelastdecade.IndianBuildingsinourcitiesconsume30-35%ofthetotalenergyproducedinthesectorwhereenergydemandandsupplyhashugemismatch.Citieshavebeenengineofgrowthbycontributing60%totheGDPbutfaceresourceschallengesandarepollutingtheenvironment.Contributionofcitiesandspeciallytheservicessectorwillincreasecities GDP contribution to 75%bytheyear2030.

ThecoalandfossilfueldependentIndianeconomy;resourcesarelimitedandenergyrequirementsareprojectedveryhighforthefuture.Theamountofconstructionactivitythathappenedoverlastdecadehadtakenatollonresourcesandthereishyper-inflationinthepriceofcement,sand,steel,glassandotherconstructionmaterials. There is a need for alternate building materials to reduce supply bottlenecks and resource challenges.AsperUSAIDEcoIIIProject2010thetotalcommercialfloorspaceinIndiawas659Msq.mwhichwillincreaseto1900Msq.mbyyear2030;with66%newstockisyettobebuilt. This will involve hyper consumption of building materials which has supply bottlenecks and resource challenged.Greenbuildingsgloballyareconsideredgloballyresourceefficientandenvironmentfriendly.Myresearchfocusesoncommercialrealestatesectorwhere66%ofthestockisgoing tobe builtbythe year2030. Looking at resources challenges mentioned above its important that new stock is built sustainably in India. In the market place currently there are Green rating system companies that provide systems for designing, construction, maintenance and measurement of green buildings throughout the life-cycle. Rating agencies claim 20 –

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30% energy savings and 30-50% of water savings and payback period of average five years which are more normative indicators and needs evaluation. Global research has indicated more tangible benefits of green buildings like higher occupancy rates, rental premium associated with green buildings which needs evaluation in Indian conditions.

If incremental costs of constructing greenenergyefficientratedbuildings,isworththefinancialbenefitsintermsoffasterpayback then market will definitely adapt green practices. Developers, Financial Institutions, Banks and Investors will make significant investments in green if green provides better economic value. Commercial real estate in India has either Build and Sell model or Build, Lease and Operate models. The benefits of green buildings will accrue mostly to later models as most of the benefits of green are monetized when the spaces are leased and the benefits like low energy and water bills, better occupancy rates and better rental bring in economic efficiencies. Currently there are three green rating brands in India after launch of IGBC new rating for green buildings in September last year; which is LEED, GRIHA and IGBC. LEED has been the leader in India with 1883 LEED certified projects and presence since more than a decade in India.

LITERATURE REVIEW

Climatechangecausedbythereleaseofgreenhousegaseshasbeenrecognizedasoneofthegreatestthreatstothemodercivilization.Researchersgloballyhavefoundthatbuildingswereresponsiblefor33%or7.85Gtofgreenhousegasemissionsworldwide(Price et.al.2006)Theemergingeconomiesinsoutheast Asiaincluding India,southAmerica,middleeastandAfricaareexpectedtoexceedthegreenhouseemissionsfromthedevelopedworldbytheyear2030.Thenegativeeffectofemissionsonenvironmentandhumanhealthhasactedascatalystforproliferationofgreenbuildingtechnology worldwide. The importance of sustainability conceptsinthecommercialrealestateisofvitalimportanceforreducingthenegativeimpactofthebuiltenvironmentonthisplanet.However,withoutfinancialjustificationandfeasibilityoftherequiredinvestmentsitwillbedifficultforsustainabilitytocomeupinabigway.

InIndiancontextit'salsotheshortageofelectricitysupplyovereverincreasingdemandforelectricity.Asper PlanningCommissionreport2013,Indiawitnessed41%shortageofelectricityintheyear2012. Buildingsaccountformorethan41%energyconsumptioninthedevelopedworld(Perez-Lombard,2008) andinIndiatheelectricityconsumedbybuildingsismorethan30% (JonesLangLaSalle,2008) whichisincreasingeveryyear.Indiangovernmenthavemadesignificantinvestmentsinpowersectorinlastdecade,butthemultiplyingdemandisfaraheadofsupplychallengesandinvestmentsneeded.Thecoalandfossilfueldependent Indianeconomy;resourcesarelimitedandenergyrequirementsareprojectedveryhighforthefuture.Theamountofconstructionactivitythathappenedoverlastdecadehadtakenatollonresourcesandthereishyperinflationinthepriceofcement,sand,steel,glassandotherconstructionmaterials.Asper USAID Eco III Project 2010 the totalcommercialfloorspaceinIndiawas659Msq.mwhichwillincrease to1900Msq.mbyyear2030; with66%newstockisyettobebuilt. InIndiademandforenergyhasbeenforecastedfor40% increaseoverthenextdecade.Fromdemandof630Mtoeinyear2012toaround900Mtoe(U.S.EIA2013a)inadecade. IndianGovernmentandMinistryofNewandRenewableEnergyhas been actively working on buildingregulatoryobligationsandincentivizationfor energy efficient buildings whichneedsmore awarenessandresearch. TheMinistrytargets toinstall 22 GW ofsolarcapacityby2022,and over 40 GW of newwindpower(MinistryofNewandRenewableEnergy - India,2012a;GWEC,2013;GWEC,2012).Theincentivesforcommercialrealestatebuildingsalreadyexistswithcapitalcostsubsidiesand electricitytaxexemption which should encourage investments. Asperresearchedliteraturebothdecentralized,off-gridsystemsandlargerscale,gridconnectedsolarpowererarerecommendedhighlyforIndianconditions.Thesolarintensityofthesuninindiaisthehighestanannualsolarenergyyieldof1,700to1,900kilowatthoursperkilowattpeak(kWh/kWp)ofinstalledcapacity(Germanyhasanaverageof900kWh/kWp)(McKinsey,2008, 2013b).Researchdoneonnumberofsolardaysavailableinayearshowsthat Indiahasabout300clear,sunnydaysperyear(Muneer,Muhammad,andMunawwar, 2005).

Normativebenefitssurroundinggreenbuildingsfocusonwhatgreenbuildings"should"deliverandimpactmarketvalueinsteadofwhat"actual"itdeliversandactualcapitalvalues.KatsG(2003)researchon33greenbuildingsinCaliforniaconcludedthereisaverageincrementalcostsof$4/sq.ftforgoinggreenbasedonselectedinterviewswithdevelopers,architectsandotherswhichwasverylesscomparedtoperceived notion of 5-15%incrementalcostsofbuildinggreen.Theproductivity,healthandoperatingexpensesavingbenefitscontributedto85%ofsavingswhichweremoreindicativenumbersbasedoninterviewwithtenants,developersandarchitectsincomparisontohavingactualnumberssupportinggreen.Manycostsandbenefitsweremodelledbasedonindicativenumbersgivenduringtheinterview.WorkdonebyPaumgartten(2003)andBartlettandNigel(2000)alsofocusedonhowSustainability"should"affectmarketvalueinsteadofevidencebasedactualbenefits.Industryandgovernmentalsodevelopedpersuasivebusinesscasessurroundinggreenbuildingstogivefinancialjustificationtotherealestatedevelopers,architects,consultingfirms,designersandownersofcommercialrealestate.Fewoftheresearchpapersontheselineswerefrom USGreenBuildingCouncil(2003),Frej(2003),Paumgartten(2003),Madew(2006),Lucuik(2005),RICS(2005),NewZealandMinistryfortheEnvironment(2006,2007)andBartlettandNigel(2000).TheindustryconsultingfirmsalsoundertooknormativeresearchtoshowrelationshipbetweensustainabilityandmarketvaluewhichincludesJLL(2004,2007a,b, 2008),ColliersInternational(2007),DavidLangdonConsulting(2004,2007)andCBRE(2007).Thesestudiesconcentrateonreducedoperatingcostsandincreasedoccupantproductivity,employeeretention,pay-backperiodsandnetpresentvalue.However,theconversionfrom"shouldbe"to"what"ishasbeenlimited,particularlyintheproductionofevidencetodemonstratetherelationshipbetweensustainabilityandvalue.

Forclassifyingthevariousstakeholders'adoptionofgreenandtheiroutlookhasundergoneevolution.SurveysconductedbyJLLandCoreNet(JLL,2007b)showsverystrongsentimentsfromtenantsandoccupiersforwillingnesstopayforsustainabilitybuttheactualdealsdoneinthemaketorevidenceofinclinationsinthemaketarelacking.

CommercialbuildingdevelopersandInstitutionalInvestorswillonlybuild,buyorleasegreenbuildingsifthe performanceandvalueformoneyissuperiortotheconventionalbuildings.Thefirststepinthiscost-benefitanalysisistofindwhatthe incremental costs of green building isovertraditionalcounterparts.Inthedevelopedworldtheincrementalcostofgreencertificationisaround2-8%basedonthegreenratingcertification.Researchdone inSingaporesuggeststhatgreenpremiumisdifferentaccordingtocertificationlevel.Foraplatinumratingits4%andforgoldratingits1.8 %(Eang2008). LEED isoneofthepopularGreencertificationmeasureinthedevelopedworld.USGeneralServicesAdministration (2004) haveagreedthatgreencostpremiumsrange1-8% dependingonLEEDachieved. Platinumratingin few USresearchedliteraturehasshownpremiumof15%intermsofcostsandtheliteraturesuggestsoptimizationoftheratingandnotgoingoverboardwiththeratingtohavereturnefficienciessothatbenefitsaccruebetter(Eichholtz2009)

AmongthedevelopedworldliteratureEichholtzetal (2008)usedregressionanalysisofrentsfromasignificantsamplesizeofover8000propertiesandconcludedgreenbuildingrentalpremiumof2%overtraditionalbuildingsinnearbylocation.Wileyetal(2008)conducted modellingthatprovidesevidencethatgreenbuildingsintheUScommandhigherrent(8%EnergyStarand16%LEED)andhigheroccupancyrates.CostarGroup(2008)compared223EnergyStarratedbuildingswith2077NonEnergystarbuildings.Thegreenrentalpremiumfoundwas6%overtraditionalbuildingsandoverfifteenmonths' period the average rentgrewby8.2%comparedto7.6%onthetraditionalbuildings.DTZResearch (2008)inAustralia and NewZealandestimated the GreenPremiumrental to be 10-15%. Table I shows the quantitative research work doneinUS where LEED and Energy star buildings showed significant rental, sale price premium and occupancy rates of green buildings were higher than conventional buildings. Rental premium ranging from 2- 17% and occupancy premium ranging from 1 – 17% is significant benefit which needs assessment and evaluation in the Indian green buildings located at various metros.

METHODOLOGY

The research method followed is basic classical ethnographic research method which involves secondary data analysis, field work and exploratory interviews. The exploratory interviews were unstructured interviews conducted at the stakeholder's office or at the conferences conducted for green buildings where all important stakeholders like rating agencies, architects, green consultants and developers participated. Another purpose of conducting unstructured interview was preparation for structured interviews and variables to be considered during structured interviews as a part of PhD Dissertation on assessment and evaluation of green value in green rated buildings as compared to conventional buildings. Out of 50 unstructured interviews conducted 80% of them were architects and green consultants working on LEED, IGBC or GRIHA rating system. Most of them by qualification are Architects who have completed green certification program with LEED, IGBC or

GRIHA and have delivered projects for developers, institutional clients or government. All the interviews conducted had stakeholders working in the NCR region only and may or may not be carrying project experience of other important metro cities where green buildings are located. Most of the secondary data analysis done was literature provided by green rating agencies and few research agencies actively working on sustainability and green construction. Websites of rating agencies, green consultants and research firms were also actively sourced for finding relevant data and literature for evaluating whether there really exists a business case for green buildings.

INCREMENTAL COSTS OF GREEN BUILDING

CII-IGBC had given indicative numbers of LEED Certified green buildings on its website for few initial buildings that were certified given in Table below.

The first certified building in the country CII-Sorabji Godrej GBC got Platinum rated in 2003 with an incremental cost of 18%. The incremental cost of making building green has come down significantly since then. Passive design strategies are important part of designing green building without much incremental investment. Active design strategy like Solar energy and photovoltaics increases the costs significantly but here too there are lifecycle benefits realized along with subsidy of 30% available from the government for using solar energy. Green consultants consider cost of green buildings as minimal if the building is in pre-design phase or project phase; has a clear green mandate and experienced integrated teams working on it. Green building construction costs can be the very same as conventional building but in design element there are additional costs involved. During the design phase one add on costs associated with green building is the co-ordination costs where various project design teams work together to put forward a common design, material selection, specification sheet and execution strategy for the green building. Amount of time and teams involved in co-ordination can make the project complex if clearly defined goals are not set in the pre design phase. Also working with experienced teams brings in time efficiencies and decrease in co-ordination costs. As an investor or developer it's important to understand cost-benefit implication of the active green strategy e.g. Solar photovoltaics and financial benefits derived from electricity costs savings. This is important to developers and financers involved in maintenance and operations of the buildings as well to look into life-cycle savings derived from solar energy. Below table on initial lot of green buildings highlights significant energy costs saving possible which should make the payback period much shorter.

Name of the Project	City Location	BUA sq.ft	Rating	% Increase in Cost	Payback Period	Year	Solar Power Yes/No
CII-Sorabji Godrej GBC	Hyderabad	20,000	Platinum	18	7	2003	Yes
ITC Green Center	Gurgaon	1,70,000	Platinum	15	6	2004/2012	Yes
Wipro-Gurgaon	Gurgaon	1,75,000	Platinum	8	5	2005	No
Technopolis	Kolkata	72,000	Gold	6	3	2006	No
Spectral Services	Noida	15,000	Platinum	8	4	2007	No
HITAM	Hyderabad	78,000	Silver	2	3	2007	No
Grundfos Pump	Chennai	40,000	Gold	6	3	2006	No
Source: CII, 2010							

Name of the Project	City Location	BUA sq.ft	Rating	Normal Building KwH	Actual Building KwH	% Reduction	Actual Savings in Lakhs
CII-Sorabji Godrej GBC	Hyderabad	20,000	Platinum	3,50,000	1,30,000	63%	9
ITC Green Center	Gurgaon	1,70,000	Platinum	35,00,000	20,00,000	45%	90
Wipro-Gurgaon Development Centre	Gurgaon	1,75,000	Platinum	48,00,000	3100000	40%	102
Source: CII 2010							

As per the claims given by the rating agencies 20-30% reduction in energy costs is possible with passive design strategies and 30-50% of water efficiency can be achieved at minimal costs but more evidence based research is needed to prove the same.

This leads to the conclusion that investment in green can definitely bring in efficiencies but the awareness regarding green buildings has tobe increased by more evidence based research. The developers specially in north India practice "Ceremonial Greening "instead of having clear mandate for green and one of the main reasons is more evidence based research. Ceremonial Greening is more related to achieving competitive advantage and creating a differentiation in the market to reduce their sales cycle instead of front end investment in green

Also few other benefits associated with green buildings need data based research e.g. Occupancy premium and Rental premium associated with green buildings over conventional and other health and productivity benefits. The conclusion drawn from exploratory interviews suggest that optimal greening can definitely bring in energy and water efficiency without incurring much of costs. An average payback period of three to seven years is achievable with green building done right.

RATING SYSTEMS AND DEMAND FOR GREEN

Currently there are three rating systems prevalent in India along with BEE Star rating for energy efficient building program of Ministry of new and renewable energy. Out of these three rating system LEED has been inexistence since 2001 and earlier was in partnership with IGBC till July 2014. IGBC and LEED parted ways and IGBC introduced its own rating system in September 2014. LEED is considered popular with Businesses and corporations with MNC clients. IGBC has been gaining momentum recently from various corporate houses after getting their rating system registered with local authorities for various incentives and scheme of local authorities surrounding green building.

GRIHA the very indigenous rating system stated by The Energy and Resources Institute in partnership and endorsement with Ministry of New and Renewable Energy has been very active on the government, institutions and public sector buildings. Currently there have around 400 + registered projects and have been popular with government and institutional clients as GRIHA rating buildings have financing incentive available from Ministry of Finance. Also GRIHA rating has incentives associated with few local authorities like 5% extra FAR and reduced Property taxes. Also there is support available from Ministry of Environment and Forestry where project above 20,000 sq.m have a special window for faster environmental clearance if the project is GRIHA rated. Many consultants during the exploratory interviews found that GRIHA is more suitable for Indian climatic conditions and has more points for water efficiency, an important parameter for Indian cities as compared to LEED. Also GRIHA has elements derived from Indian traditional architecture system where passive design strategies were actively engaged. GRIHA rating is considered more robust by few consultants but there are concerns related to marketability and material selection section of the rating. GRIHA final rating is given to the building only after its occupied for one year where operations and maintenance performance are measured instead of energy simulations based on which LEED rating is given. The incentives associated with GRIHA makes it attractive option whereas LEED's popularity and global brand name makes with successful with businesses which have international operations or aspire to be one.