



Green sense and Benchmarking

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BUILDING SENSE



‘Building sense - beyond a Green Façade of Sustainable Habitat’ CSE publication has highlighted few fundamental questions in past

- *Do we know what green means*
- *Performance benchmarking of Green buildings*
- *Right institutionalization for green*

OUR MISSION

GREEN SENSE should reach to grass root level

Just designing one or few platinum rated building we cannot solve all the problems on the contrary by empowering and reaching out with structured awareness and knowledge at local levels we can reduce energy consumption and increase the environment responsiveness of the whole neighborhood and the city as a whole.



CSE INITIATIVES

PROMOTING SUSTAINABLE DESIGN IN OUR COMMUNITIES



GOAL

- CSE is focusing its energy as an organization on **promoting sustainable design in our communities** by advocating for positive change at education as well as at regulatory levels.

Process

- CSE bring teams of volunteer professionals (such as planners, architects, urban designers, MEP, etc) to work with educational institutes and bodies, decision-makers and other stakeholders to help them understand, develop a vision and framework for a sustainable future.

Broad Outcomes

- Increased participation of students, teachers, educational institutes and bodies under green forums and regional dialogues on sustainability
- Modification in curriculum of Planning and Architecture streams
- Modification in regulatory approach and methodology (from voluntary to mandatory)
- To discuss and train local/state employees under regulatory framework, in the sustainable principles as well benchmarking systems
- Enacting new laws/amend old laws to promote green buildings and sustainable development
- Outreach and awareness through publication, articles, forums etc



CSE INITIATIVES

TO PARTICIPATE AND CELEBRATE CURRENT BEST PRACTICES



GOAL

- CSE is focusing its energy as an organization on mandating transparent sharing of information on green features, costs and pay-back, and performance of buildings and products so as to create a best possible program/information exchange for communities.

Process

- CSE foster such analysis which could reflect the state of affairs, benchmark performance of buildings and products, promote best principles and practices, upscale of ancient science and knowledge of green etc.

Broad Outcomes

- Establish regulatory framework to mandate performance monitoring, reporting and disclosure of resource use in rated buildings.
- Fiscal encouragements to be linked with post construction performance monitoring
- A consensus based measurement and benchmarking instrument, which provide a needed tool for community-wide liveability and sustainability.
- Outreach and awareness through publication, articles, forums etc

WHY BENCHMARKING SYSTEMS



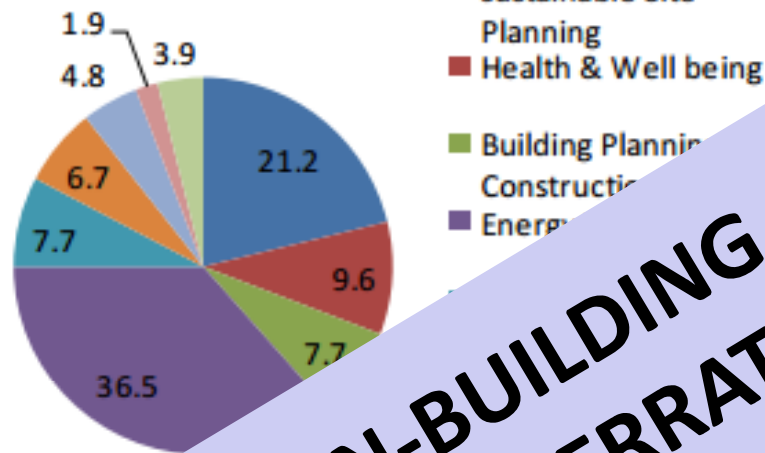
Sl. No	CATEGORY	LEED	GRIHA
1.	MANAGEMENT/SUSTAINABLE SITE		
	Site selection/Reuse of land/Reclaimed land/Sustainable construction	Y	Y
	Preserve and protect the landscape during construction / Preserve top soil / Existing vegetation	Y	Y
	Soil conservation/Top soil laying & stabilization/Hard landscaping & boundary protection	N	Y
	Brownfield redevelopment	Y	N
	Design to include existing site features	Y	Y
	Building & site operation & maintenance	N	Y
	Project management	N	Y
2	ENERGY/ENERGY EFFICIENCY/ENERGY USE		
	Renewable energy utilization	Y	Y
	Minimum energy performance/Optimize ozone depletion	Y	N
	Fundamental building commissioning/Measurement & verification/ Energy monitoring/metering & monitoring	Y	Y
	Ozone depletion	Y	Y
	Additional commissioning	Y	N
	Energy improvement/Green power	Y	Y

Source: JOURNAL OF INFORMATION, KNOWLEDGE AND RESEARCH IN CIVIL ENGINEERING

WHY BENCHMARKING SYSTEMS

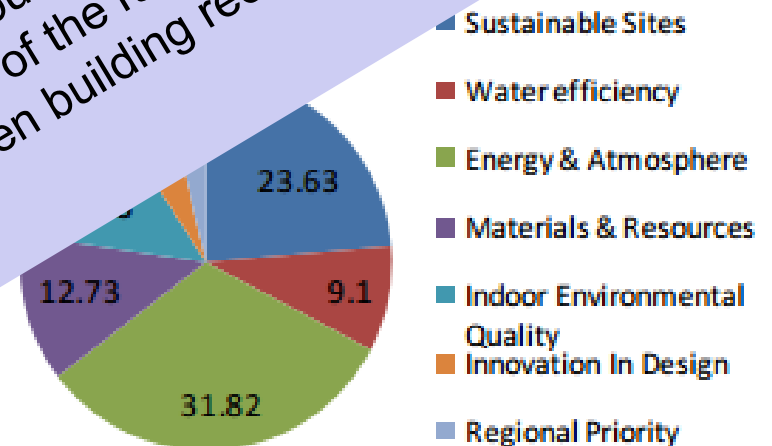


GRIHA



GREEN-BUILDING RATING: OVERRATED

Also, How many rated buildings are there on the ground?
 What is the official database on buildings?
 What are the green credentials of the rated buildings?
 How soon can the cost of green building recovered?



Source: JOURNAL OF INFORMATION, KNOWLEDGE AND RESEARCH IN CIVIL ENGINEERING



REGIONAL INPUTS



CSE would like to play a critical role in regional dialogue influencing the following:

- Assisting the state/local governments in preparing their own Green Benchmarking systems for buildings
- Encourage consideration of building sense elements to the Authority in additions to other essential guidelines.
- Guiding the empanelment of Empowered Committees or Peer Expert Groups and ascertaining training needs and other necessary constituents facilitating approval process

Other Areas of Interest shall be

- Reviewing and strengthening the scope and essence of environmental conditions as proposed under various categories of buildings
- Risk assessment methodology - working with risk matrix and risk classification for building sector
- Characterizing and elaboration of urban form and impact on environmental value under additional FAR conditions
- Critical review of carrying capacity analysis methodologies for infrastructure considering floating FAR dimensions.

CSE BENCHMARKING



Design and
construction stage

Design, Environment, Ecology and Mobility (DEEM)

- Green Mandate
- Environmental Footprint of Materials – healthy and green procurements
- Ecological features and protected land and other environmental parameters
- Building Envelope
- Location and accessibility
- Green Cover and practices and rainwater and grey water use and other drainage characteristics

Services and Systems (SS)

- Energy Demand, use of renewable, efficiencies and performance benchmarking (CDD, EPI etc)
- Lighting design, efficiencies and pollution
- Water consumption, efficiencies, performance benchmarking
- Waste Management
- Other fuels efficiencies, performance benchmarking
- Refrigerants

Operations, Maintenance and Controls (OMC)

- Operations plan, Monitoring plan and safety
- Ease of Maintenance
- Thermal Comfort and User control
- Health and indoor controls
- Internal Layout adaptability and resilience
- Wellbeing and others
- organogram, Staff trainings & outreach

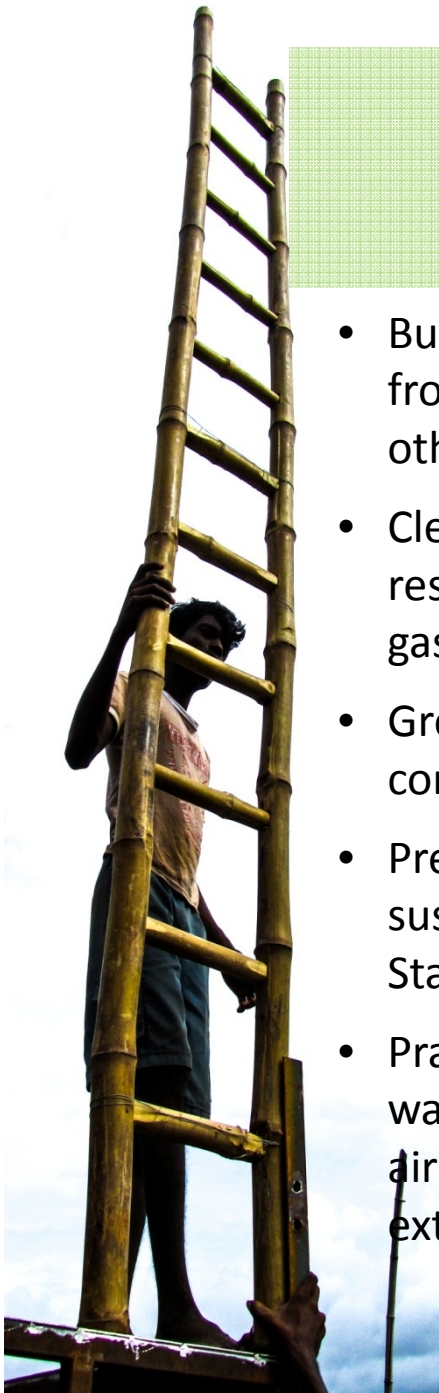
Performance
Stage

Design benchmarking
and targeting stage





DESIGN AND CONSTRUCTION STAGE



DEEM – GREEN MANDATE



- Building conforms to the requirements of the local bye-laws, set backs from specified zones and within building, safety, security, wellbeing and other necessary parameters as stipulated from time to time
- Clearances from all regulatory bodies - Irrigation, revenue, disaster response & fire, heritage conservation, airport, railways, defence, oil and gas, religious importance, structure stability, traffic police etc
- Green Mandate declaring all sustainable practices and coverage e.g. compliance to ECBC, rating, etc
- Pre-during-post strategies for design, implement and operate sustainable regimes e.g. Policy/EIA/EMP/EMS/ISO/Method Statements/etc
- Practices during construction phase like top soil conservation, ground water, labour camps, monitoring of environmental parameters, waste, air environment controls through dust and fumes, ambient noise, extraction, vehicles pollution etc

A full-page photograph of a man climbing a tall, narrow bamboo ladder. The ladder is made of thick bamboo poles and is positioned vertically against a bright, cloudy sky. The man is wearing a light-colored, patterned shirt and dark shorts. He is barefoot and is holding onto the ladder with both hands. The ladder is leaning against a wooden structure at the bottom. The overall scene is bright and clear.

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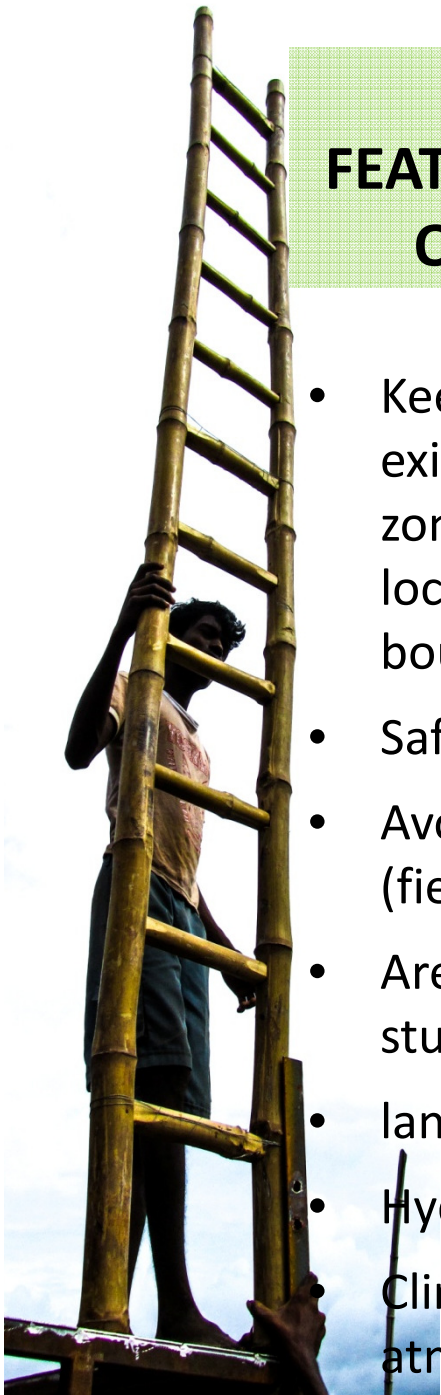
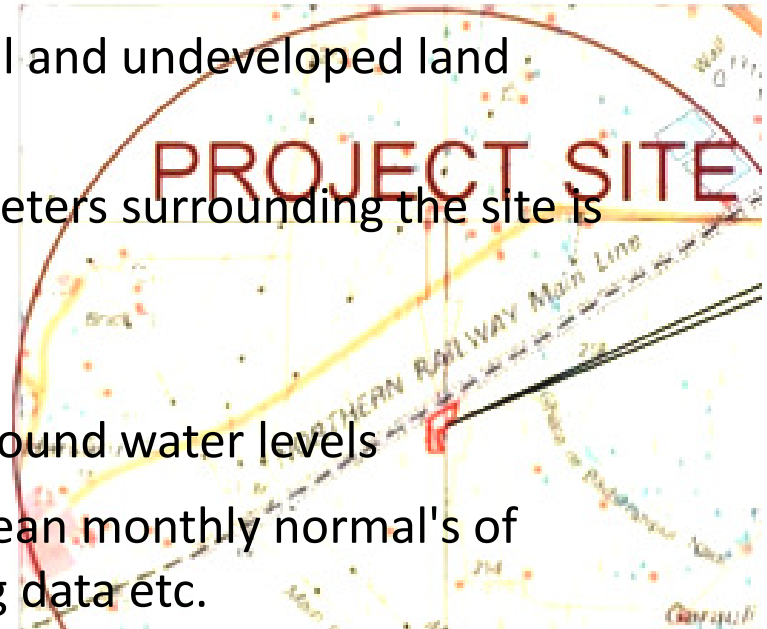
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Source: Colourbox

DEEM - PROTECTION OF ECOLOGICAL FEATURES, SENSITIVE LAND PROTECTION AND OTHER ENVIRONMENTAL PARAMETERS



- Keeping records of local ecological characteristics, protection of existing plant and animal habitats, environmentally sensitive zones e.g. wild life sanctuaries, water bodies and national parks location (all green and blue) within 10km radius from project boundary are identified based on secondary data
- Safeguards for above mentioned green and blue zones
- Avoiding construction on agricultural and undeveloped land (fields, forests etc)
- Area with angular distance of 500 meters surrounding the site is studied in detail
- land use pattern in the past
- Hydro-geological settings and the ground water levels
- Climatic data specific to the site - mean monthly normal's of atmospheric parameters, soil testing data etc.





DEEM -BUILDING ENVELOPE CHARACTERISTICS



INFLUENCE OF THE OUTDOOR MICRO-CLIMATE, ENERGY DEMAND FOR COOLING AND HEATING, ACOUSTIC COMFORT, NOISE PROTECTION, VENTILATION

- Microclimatic parameters
- Design principles
- Use and user adaptability
- Technology – material advancements

These should help to achieve

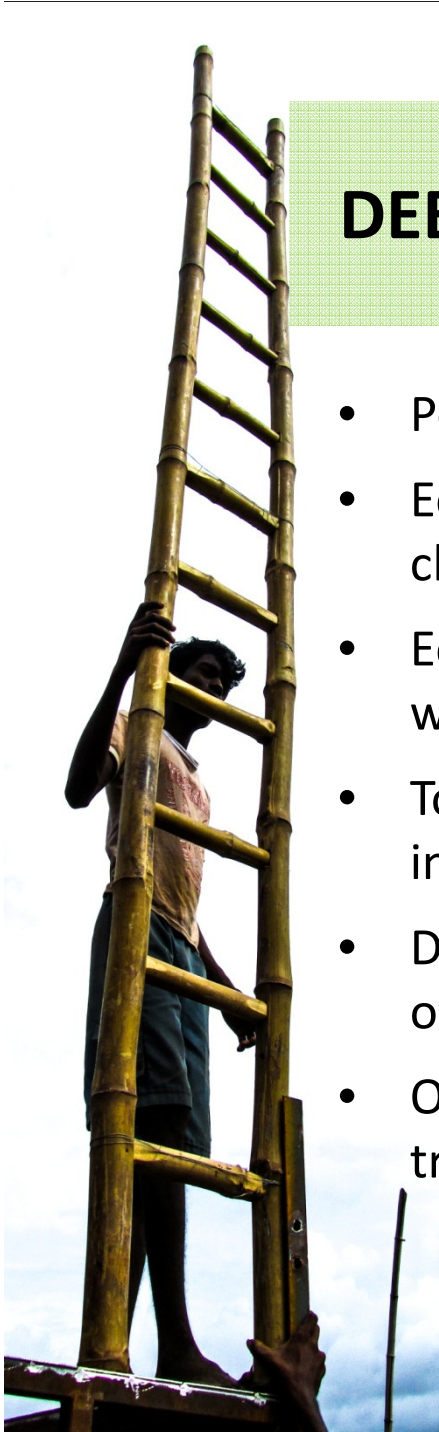
- Reduction in heat island effect
- the lowest possible cooling and heating demand for the building
- protection against outdoor and indoor noise and air pollution
- providing suitable levels of ventilation and visible lighting inside the building and prevention of leakages



DEEM -LOCATION AND ASSESSIBILITY



- Proximity and sufficiency of public transport, green spaces and amenities (convenience store, day-care and education, public administration, post office, bank, healthcare)
- Design needs for cyclist, charging for electric vehicles, shuttle services, pooler preference etc; last mile connectivity, travel demand management
- Parking design and calculations
- Design for systems promoting travel reduction through ICT e.g. net meeting, video conferencing etc
- Common areas and other parts of the building are specially adapted for use by differently abled persons e.g. facility design standards for access, washrooms, lifts etc
- Controls and restriction e.g. sites in old/existing built-up areas / congested areas / settlement



DEEM - GREEN COVER AND PRACTICES



- Percentage of green cover
- Eco-friendly landscaping practices to minimise the impact of chemicals on ecology
- Eco-friendly landscaping practices to minimise the impact of water usage and efficiencies
- To maximise composting from green waste, plans, practices and initiatives
- Design consideration for rain water harvesting for demand offset and recharge
- On site waste water treatment practices e.g. grey-water treatment and usage

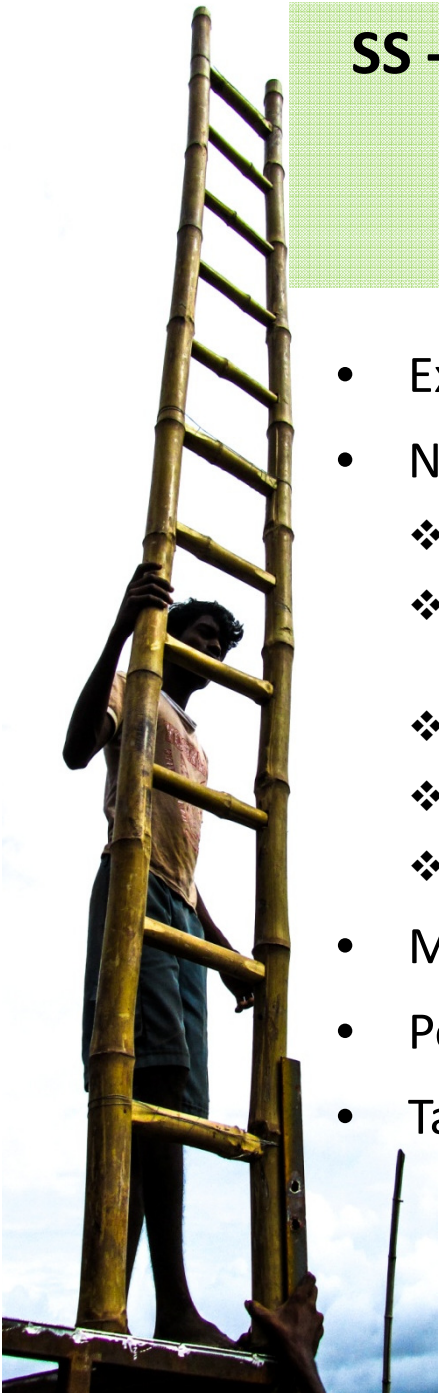


Design benchmarking and targeting stage

SS - ENERGY DEMAND, USE OF RENEWABLE, EFFICIENCIES AND PERFORMANCE BENCHMARKING (CDD, EPI ETC)



- Excellence beyond compliance and guidelines
- Net Energy demand calculations
 - ❖ Designed energy demand (seasonal and occupancy)
 - ❖ built-in offsets through DEEM parameters and efficiencies through design and technology
 - ❖ Alternate fuel switching practices
 - ❖ Proportion of energy use from renewable sources (onsite and off site)
 - ❖ Controls for wastage and leakages
- Monitoring and metering mechanisms
- Performance benchmarking (CDD, EPI etc)
- Targeting (CDD, EPI etc)



SS - LIGHTING DESIGN, EFFICIENCIES AND POLLUTION



- Reduce light pollution from exterior and façade lighting to increase night sky access
- Net energy demand calculations for lighting
 - ❖ Designed energy demand
 - ❖ built-in offsets through DEEM parameters and efficiencies through design and technology
 - ❖ Controls for wastage and leakages
- Monitoring and metering mechanisms
- Performance benchmarking (LPD etc)
- Targeting (LPD etc)



SS - WATER CONSUMPTION, EFFICIENCIES, PERFORMANCE BENCHMARKING



- Excellence beyond compliance and guidelines
- Net Water demand calculations
 - ❖ Designed water demand (seasonal and occupancy)
 - ❖ built-in offsets through DEEM parameters and efficiencies through design and technology
 - ❖ Controls for wastage and leakages
- Monitoring and metering mechanisms
- Performance benchmarking
- Targeting



SS – WASTE MANAGEMENT BOTH HAZARDOUS & NON-HAZARDOUS WASTE



- Design consideration for waste collection, handling, segregation, pre-treatment, reuse and disposal
- Use of recycled construction materials
- Waste reduction and minimization
- Sorting and secure
- Safe disposal mechanisms
- Monitoring mechanisms
- Benchmarking
- Targeting



SS – OTHER FUELS, EFFICIENCIES, PERFORMANCE BENCHMARKING



- Excellence beyond compliance and guidelines
- Net demand calculations
 - ❖ Designed demand (seasonal and occupancy)
 - ❖ built-in offsets through DEEM parameters and efficiencies through design and technology
 - ❖ Controls for wastage and leakages
- Monitoring and metering mechanisms
- Performance benchmarking
- Targeting



SS – REFRIGERANTS

- Use of eco-friendly refrigerants in the building
- GWP of refrigerants for designed system
- Halon in fire suppression systems and other systems
- Plans for phase out





Performance stage



OMC – OPERATIONS PLAN, MONITORING PLAN AND SAFETY



- Asset identification and mapping
- OEM instructions , performance and associated maintenance needs e.g. installed systems effectiveness based on standard parameters, working procedures, method statements etc
- Maintenance programme, conditions records, inspections and certificates
- Testing regime and Quality monitoring
- Benchmarking, monitoring effectiveness and target achievements
- Hazard and risk identification and risk register, management plan
- Working environment and welfare assessment
- Checks and records for human and equipment safety e.g. PPE, permit system, prevention devices etc



OMC OTHER FEATURES



- **EASE OF OPERATIONS** - maintenance and replacement of technical appliances and systems should be simple to implement- space standards and schedules
- **COMFORT** - providing an appropriate level of comfort in the interior of the building throughout the year - setting of operating standards, automation or controls to vary/ramp parameters considering occupancy, season and time e.g. CO₂ monitoring and control for dampers, occupancy sensors, timers
- **USER CONTROL** - the possibility of controlling temperature, ventilation, lighting, protection from the sun within stipulated range - open able area etc



OMC OTHER FEATURES



- **HEALTH AND INDOOR CONTROLS** - To minimise the exposure of occupants to hazardous indoor pollutants which affect indoor air quality and occupant health e.g. Eco-friendly safe housekeeping chemical, machine rooms etc
- **Internal Layout adaptability and resilience** - the possibility of adapting the building's plan layout to the needs of the user, future use and climatic conditions e.g. contingency plans, design flexibility etc
- **Wellbeing and other controls**- well-being facilities (such as gymnasium, aerobics, yoga, meditation or any indoor / outdoor games), restriction on air polluting vehicles use, alternate fuel promotion in vehicle fleet etc
- **Organogram, Trainings and outreach** – organisation structure for implementation, staff engagement, training , communications



Thank you