Session – VI

Land Use And Development Regulations

Session – VI

Innovative Landuse and Development Regulations

G. DATTATRI

Citizens Alliance for Sustainable Living (SUSTAIN)

Purpose of the Master Plan

The purpose of the Master Plan is to make Chennai a prime metropolis which would be

- More livable
- Environmentally sustainable
- Economically vibrant
- With better assets for future generations

Realising the Goal

The realisation of this visionary goal is the joint responsibility of a large number of stakeholders

- Government and Parastatal Agencies
- Private Sector Corporates and Entrepreneurs
- Citizens including NGOs and CBOs

  Partnering with CMDA

The Master Plan

The Master Plan is a guiding document of policies, programmes and projects for all stakeholders to follow

CMDA's role would be

- to support the effort of all stakeholders
- to implement spatial strategy landuse and development regulations
- to monitor and review of implementation of policies, programmes and projects in all sectors of development and provide the necessary feedback for improvement

Tools for Implementation of Spatial Strategy

- Landuse Zoning
- Development Regulations
- Area Development Plans
- Monitoring and Review Mechanism

Landuse Zoning

- Estimating and providing lands required for development [Volume 1 Tables 12.1 and 12.2]
- Demarcation of areas for conservation of eco-sensitive and agricultural areas [Rules 24 (2) a, b, c; 24 (3) a & b; 24 (5); 31; 32]
- Creating a special zone for hazardous industry [Rule 18]
- Setting apart urbanizable zone [Rule 21] and increasing mixed residential use zone [Volume 1 Tables 12.1 and 12.2]
- Permitting multi-storey buildings in most parts of CMA [Rule 24 (1) and Annex IX]

Land Use Zoning – Resulting Impact

The new land use zoning provisions would promote development of composite neighbourhoods with economic activity close to residential areas minimise travel, conserve ecologically sensitive areas, segregate hazardous uses and provide a more conducive environment for residents

Development Regulations

- 10% Reservation of land in all future developments of plus 1 ha. for EWS and LIG housing [Rule 28 (17) and 29 (9)]
- Promoting smaller residential units in MRTS influence area [Rule 24 (4) (a)]
- Promoting composite neighbourhoods (Rule 29 (10)]
- Reduction of minimum extent of plot for EWS housing [Rule 25 Table 1A & B]
- Additional FSI of 0.25 for small dwelling units [Rule 27 (3) Note (ii)]
- Premium FSI in selected notified areas [Rule 36]
- Transfer of Development Rights (TDR) [Rule 9]

Development Regulations – Resulting Impact

- Promote decongestion of Chennai City, promote higher density development outside the city and in improved traffic corridors, ease road widening and assist urban renewal
- Promote increase in housing stock particularly for low and middle income groups

Area Development Plans

- Master Plan – policies, strategies and programmes at CMA level
- Area Development Plan – neighbourhood, town, city sectors through DDPs (Volume 1 Chapter XII G)
- DDPs would be the basic building blocks for improving quality of life at local levels and promoting sustainable development (Volume 1 Chapter XII G)

Area Development Plans – Resulting Impact

- Promote inclusive development
- Improve infrastructure and facilities
- Upgrade quality of life at local level

Monitoring and Implementation of Master Plan

- Spatial Strategy – Landuse and Environment Committee
- Economic Development and Poverty Reduction – Economy and Employment Committee
- Improving Mobility – Traffic and Transportation Committee
- Development of Infrastructure and Housing – Shelter and Infrastructure Committee
- Timely Investment and Improved Governance – Investment Planning and Governance Committee

(Volume 1 Chapter XIV)

Tools for Monitoring

- Setting Up Livability Parameters
- Developing Urban Indicators for Chennai
- Studies for Fine Tuning Policies, Programmes and Projects

(Volume 1 Chapter XIV)

Suggestions for Technical Assistance

City Development Initiative for Asia (CDIA) of Asian Development Bank

- Technical assistance in position by CDIA for CDP Review and Pre-feasibility study on waterways rehabilitation and solid waste management
- CDIA can become a partner in strengthening the monitoring mechanism

Monitoring and Implementation of Master Plan – Resulting Impact

- Help in updating policies, programmes and projects through special studies and surveys
- Help keep track and monitor through measurable indicators, economic progress, poverty reduction, housing satisfaction, mobility convenience, environmental improvement
- Take all remedial steps needed towards achieving the vision and goals set for Chennai Metropolis

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Session - VI

Heritage Buildings and Development Regulations

P.T.KRISHNAN
Architect, Chennai.

At a first glance of the Second Master Plan there is a problem with the title which talks of "Rules for Regulation of Heritage Buildings" which to my mind conveys a meaning different from preservation or conservation of Heritage Buildings. May I suggest Heritage Conservation Regulations or Heritage Regulations as the appropriate title as in all other master plans.

In 1999 I was part of a CMDA committee which drafted out regulations for conservation of Heritage Buildings, Historic precincts and Natural features, This draft was based on the GOI draft regulations of 1995 and the Greater Bombay Heritage Regulations also of 1995.

The defining feature of these and other subsequent regulations in other states was the fact that it recognized heritage as a local issue based on local history and traditions.

To give effect to this and considering the complexities involved in defining and grading heritage a committee comprising historians, archaeologists and others well versed in local customs was to be setup under these rules to decide on all matters relating to conservation and administration of these rules. The draft clearly defined the composition of the committee and its terms of reference which included a supervisory role in monitoring the implementation of the regulations.

The second master plan however, while recognizing the need for such a committee has immediately, in the next sentence, provided for overruling its recommendations, under "exceptional" circumstances, by an individual - the Member Secretary of the CMDA. It also states very superciliously that the Member Secretary shall not delegate these powers to anybody else. What are these "exceptional" circumstances and how does the Member Secretary have a greater knowledge and understanding of these circumstances than an august and highly qualified group of individuals appointed by the government? The fact that the setting up a committee and a mechanism for over-ruling its findings is being spoken of in the same breath shows a lack of seriousness and commitment to the issue at stake arid to the supposedly democratic planning process.

If the CMDA is to achieve its stated objectives, It is essential that there should be no undermining of the role of the Heritage Conservation Committee.

Natural Heritage

The definition of Heritage as understood by all includes man-made and natural heritage. All Heritage legislation in this country includes the protection of natural features of environmental significance, scenic beauty etc. apart from protection of heritage buildings.

In the second master plan the definition of heritage does not include natural heritage. It is left out totally. One does not understand the logic in this as Chennai with its shore line, estuaries, Wet lands and river systems is an ecologically sensitive area with a rich but degraded natural heritage. If protection and restoration of such defining features of our city is not included in Heritage regulations, then how will we save the city from environmental disaster. All other provisions of the DCR including a statement on ecologically sensitive areas deal only with building construction and regulation of development in these areas. There are no proposals relating to restoration and management of environmentally sensitive green areas and open spaces. In fact an interesting feature of the DCR is that green areas and recreation zones are not differentiated. Further, in recreation zones and therefore by extension in green zones you can build truck terminals, multiplexes, stadia, cinema theatres etc. So in effect all our green areas are open to construction. Clearly our natural heritage is up for grabs.

Historic Zones

It is well understood that historic zones in any city need protection. Apart from mentioning it in passing no strategy has been identified in the SMP as to how such protection is to be achieved.

The master plan should specifically identify heritage precincts and historic zones which are to be protected. Once this is done, the conservation plan for each of these zones should be drawn up, debated and taken through the notification process. As it stands the master plan document is entirely based on physical land use and does not look at culture and historicity. as valuable planning components thereby dissociating the city from its people and their identities.

In this connection I would like to bring to your notice what appears to me a serious disconnect or anomaly in the structure of the second master plan.

It is my understanding that the planning process commences with a Master Plan which has to be followed by a detailed development plan for each of its constituent planning units which takes into account the urban design and cultural component. It is from this that building controls or development controls as we understand it should evolve. The DCR's will then be sensitive to local issues and therefore be more relevant and sustainable. The practice of painting all parts of the city with one brush whether it is new or old, culturally different or

otherwise should stop. The fact that there are developments controls rules without detailed development plans is not an acceptable planning process.

Built Heritage

The regulations do not contain a list of heritage buildings and precincts needing protection. Presumably because there is a notification process to be gone through before they are incorporated. Without such a list with appropriately graded heritage buildings the entire process of heritage protection will be a non-starter. The CMDA has such a graded list which identifies about 140 buildings. A good number of them are public and semi-public buildings owned by government and which are land marks in the city. These buildings do not require a notification process before they are incorporated officially into the list. So why cant they be included now as a core-list which can be added to once the heritage committees and other mechanisms are set in place.

An important feature of the GOI draft and other state/city regulations is that ownership rights are given priority and the system is expected to function on the basis of incentives provided to owners of heritage .buildings instead of penalizing them through restrictions. Obviously such an exercise will require funding on a scale which, given: our political priorities, will not materialize. Therefore in order to make these regulations sustainable the concept of transfer of Development Rights has been thought about. Though this is in many ways a contentious topic, it is the only workable mechanism available in the current context. The process though, is a highly complex one and needs to be dealt with in great detail. It needs to be integrated with the land use and development strategy so that receiving areas can be effectively identified. This requires availability of infrastructure in receiving areas to cater to this additional load, acceptance by the locals and price adjustment formulae related to land values.

TOR's is not just a tool for heritage conservation alone it is a mechanism by which several social issues can be addressed such as making land available for ecological sustainability, housing the urban poor who cannot afford transportation to centres of employment, without straining the finances of government.

I understand that CMDA is in discussions regarding this for enabling infrastructure projects. I request that a similar exercise be taken up for incorporating this feature in a practicable form in the Heritage regulations as well.

Finally I wish to impress on the authorities the dice need for a comprehensive and workable part of regulations on heritage as litigation on this subject is on the rise. As this is the only course available at present to save our heritage.

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Session - VI

The Role of Professionals in Urban Development

Prof. S.F.Rajaratnam.
Chairman, Indian Institute of Architects, Tamilnadu Chapter

The Role of Professionals in Urban Development is to ensure a better quality of life for the citizen. Advancement of economic growth, social and cultural welfare are responsible for problems aplenty and we hear a lot of complaining. To stop the complaining we should start doing something keeping in mind that land area in the city is utilized to the maximum and meets the aspirations, needs and demands of the citizens.

Cities are the creations of people, built by people and for people. Various analysis indicate trends, impacts and traits. A city that functions adequately need not be aesthetically satisfying. The requirements of city people are innumerable and the outlooks more passive than active. The ugliness of any environment is the absence of civic pride, the ambition for greatness is false pride and an illusion of grandeur. Face-lifting certainly will not do the job. Architects are creators through whom the people should reach goals they set for themselves. People have the power to control the environment and determine the direction to suit the purpose.

From statistics that reveal the habits of the urbanite the distances people walk from their parking place to their destination is varied. Reluctance to walk is interpreted as a significant characteristic of the present day urbanite. Soon free parking on the street would be impossible. Parking at shopping centers, malls etc. will also not be given free. The Architect has to 'educate his clients, on economies of providing sufficient basement parking and also higher level parking spaces to enhance business at their centers, and not providing them to meet the mandatory requirements. The transition spaces between the parking lots and the activity area should be made interesting visually, to psychologically reduce the distance of walking which could indirectly help in providing the exercise required for the individual. Similarly office buildings should be designed with both free parking and paid parking to encourage the office goers & visitors to use the public transport or car park to work, which in the process helps to reduce polluting of air and controlling traffic. The walks between parking area and the work area should be interesting with gentle ramps, and minimal steps. Hospitals, factories and special buildings need a slightly complex means of handling the parking solutions and innovative means could be zoned and created.

Man by nature needs bountiful natural light and air and hence public transport by traveling underground is not the desirable solution. Apart from surveys carried out by the public transport corporations to increase their efficiency, care has to be taken for providing comfort to passengers, efficiently, functionally and aesthetically at destinations and the

intermediary stops. This would entail the provision of wash rooms, resting places, pleasant vistas, arcades, prominent signage, pleasant lighting, romantic street furniture, barrier free paths & safe movement, surprise elements, etc. Long term planning has to be visualized apart from short term execution. A holistic approach is required where experiences, history media commentary and even gossip will help to find an operative solution. .

People have begun to recognize and nurture buildings that have historical values. Continuous efforts have to be taken to respect our heritage, for it tells us who we are and how we evolved from the past. The architects involved with contemporary buildings adjacent to these historical structures should consider getting their proposals in harmony as a principle priority. A few blank areas could be created at vantage points in the buildings for advertisement posters which could provide interest to the viewer and discourage hoardings.

Technical progress is all about us and it has expanded in leaps and bounds in the past few years. Gadgets are a part of our development. Self discipline in organizing the advantages is lagging since the city dweller is suffering distraction. It is the architect's responsibility to create niches for air conditioners, spaces for generators, areas for solar panels in order that the buildings are not repulsive to the on looker. Interiors have to be worked with sufficient spaces for washing machines, kitchen gadgets, utility verandahs, and balconies for drying clothes. Arrangement for convenient disposal of garbage, like storage areas, chutes, and convenient service roads to access the same have to be considered much is said about the qualities of use, space, material, light, etc. but buildings can say nothing with regard to the reasons why the people involved decided to make them the way they are. Instead they offer clues, making this aspect of architectural appreciation a kind of enigma.

I would like to emphasize that advice should be sought from the architects as early as possible, preferably when the site for the building is chosen. This will lead to considerable saving of trouble and money. The architect could simultaneously address the practical dimension of this conceptual scheme and the details of implementation as well as to think creatively of what the building wants to be. It should be understood that if the architect carries out his services sincerely and diligently his worth to the owner and society would ensure value for expenditure.

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Session - VI

Green Architecture – Buildings

Tmt. Roopmathi Anand, Architect, Chennai.

WE SHARE THE SAME WORLD!!!!

"Hargrove, what's all this I hear about your living in constant fear of the polar ice caps melting?"

AS ARCHITECTS, WHAT DO WE DO?

GREEN ARCHITECTURE – ITS HAND TO SAVE EARTH

- Tangible benefits saves
  - Energy upto 50%
  - Water upto 35%
- Imparts Green corporate image
- conserves natural resources and the mitigates climate change.
- Uses energy resources effectively.
- Produces less material waste.
- Addresses broader environmentally based philosophies that green building relates.
- Productivity increases by 20%.

A FEW LEED RATED BUILDINGS...INTERNATIONAL

1) CENTER FOR INTERACTIVE RESEARCH ON SUSTAINABILITY, CANADA

This ambitious project is already earning pre-kudos for being the greenest building in the world.

FEATURES: 100 percent day-lit workspaces, greenhouse-gas neutrality, and on-site treatment of wastes, and it will serve as a state-of-the-art "living laboratory" where sustainable building systems can be researched and assessed in action.

2) CESAR CHAVEZ LIBRARY.

This Library is situated in Phoenix, Arizona.

FEATURES: Order to protect the outdoor and indoor space from the sun's radiation, the building uses extensive overhangs to create a 'hat' in the desert. The windows are also properly shaded to reduce solar gains.

3) SWISS RE TOWER, LONDON, U.K.

Europe's first green skyscraper features 40 stories of fabulous, pickle-shaped fun.

FEATURES: The aerodynamic headquarters of reinsurance company Swiss Re uses 50 percent less energy than a traditional office building and features gardens on every sixth floor for air purification.

4) ALMADEN TOWER AND EAST & WEST TOWERS, U.S.

This LEED platinum-certified complex, is the headquarters of Adobe Systems.

FEATURES: Over the course of five years, the company put $650,000 into eco-features -- like an irrigation system that self-adjusts according to weather conditions – and saw $728,000 in savings as a result.

5) BRINDABELLA CIRCUIT, CANBERRA INTERNATIONAL AIRPORT, AUSTRALIA

An office building that earned the first-ever 5 Green Star rating from the Green Building Council of Australia.

FEATURES: Made with 90 percent recycled steel and 100 percent recycled or sustainable timber, the building will get 70 percent of its energy from solar power and use far less water than a typical facility.

6) GRAND RAPIDS ART MUSEUM.

One of the oldest GOLD RATED museum building.

FEATURES: The museum is an impressive addition to the renowned architecture of the "sculpture city".

7) VERBENA HEIGHTS

It is reputed to be the first high density housing in Hong Kong that took green environment issue seriously from day one.

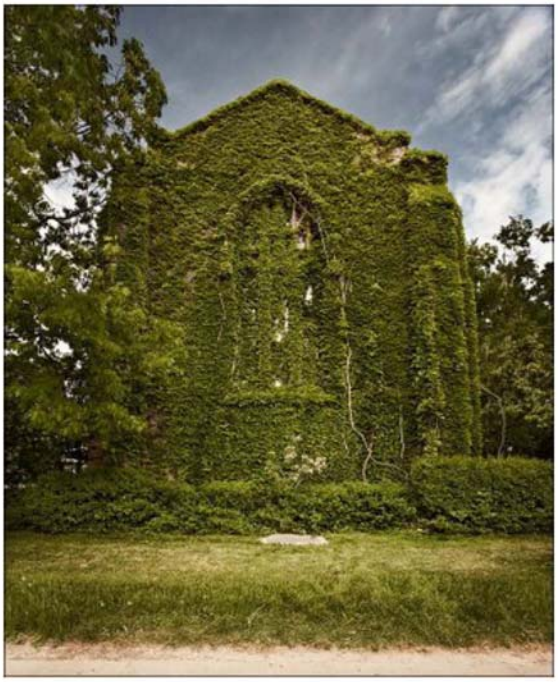
FEATURES: Linear blocks planned around three elevated landscaped courtyards. Extensive wind tunnel tests were conducted to maximize natural and cross ventilation at the ground and the upper levels.

Solar and daylight studies went hand in hand with ventilation studies. External screens and light shelves were employed to provide effective shading as well as to enhance daylight in interior spaces. Vertical shading devices were preferred as they are less problematic in terms of maintenance and hygiene in high-rise living conditions. Low embodied energy and longer lasting and recycled materials were specified, and using reusable formworks reduced construction wastes.

8) HIGH LINE 23 NEW GREEN TOWER

High Line 23, or HL23, is a new green building that is currently under construction.

FEATURES: The structure is a 14 floor mixed use of gallery space and condominiums with amazing views of the evolving High Line elevated park preservation and green space reuse project. With an impressively small footprint of just 40' x 99' and a multitude of green building technologies, HL23's cantilevered silhouette is made even more exquisite by the expected achievement of LEED Gold certification.



A FEW LEED RATED BUILDINGS...INDIAN

Some of the LEED certified green buildings are:

CII - GODREJ BUILDING, HYDERABAD

First structure outside the united states to receive the prestigious "platinum" LEED rating from the U.S. Green building council (USGBC).

GREEN POINTS AT WIPRO TECHNOLOGIES DEVELOPMENT CENTRE

- 82.2% of the total roof area is green, covered with terrace gardens
- 27% of the external area has concrete grass pavers and 17% is covered with vegetation
- 100% of the water is recycled
- 50% of occupants have personalized temperature, light and thermal conditions

WIPRO, Gurgaon - Platinum

- 46% saving in the electricity bill by channeling natural light and air
- Wood used in construction of building sourced from shipwrecks from Jamnagar port
- Cafeteria furniture hand-picked from chor bazaars (flea markets)
- Leftover building material used for landscaping external area
- Photocell-based controls automatically dim available light based on daylight, reducing energy wastage

ITC GREEN CENTRE, GURGAON - PLATINUM LEED RATED

PATNI COMPUTER SYSTEMS, NOIDA – PLATINUM LEED RATED

RMZ MILLENIA BUSINESS PARK,OMR – GOLD LEED RATED

- NDPL, Delhi
- IMTMA, Bangalore
- NEG Micon India Pvt. Ltd., Chennai
- Technopolis, Kolkata
- Olympia Technology Park, Chennai
- IGP Office, Gulbarga

GRUNDFOS, CHENNAI – GOLD

GREEN ARCHITECTURE - AN INSPIRATION FROM NATURE

TIME has been the fourth dimension of architectural space as it exists in time. Time gives life to an object. It also relates to the dynamic nature of the architecture in contrast to the static image we have created – micro climatic modifier

As Architects, we should design our buildings based on ECOLOGICAL INTELLIGENCE which can even embody BIO-MIMICRY inspired by nature. They would really provide valuable and appropriate direction for us. These principles mimic biological metabolism with technical metabolism, considering the context.

NATURE AS A GUIDE

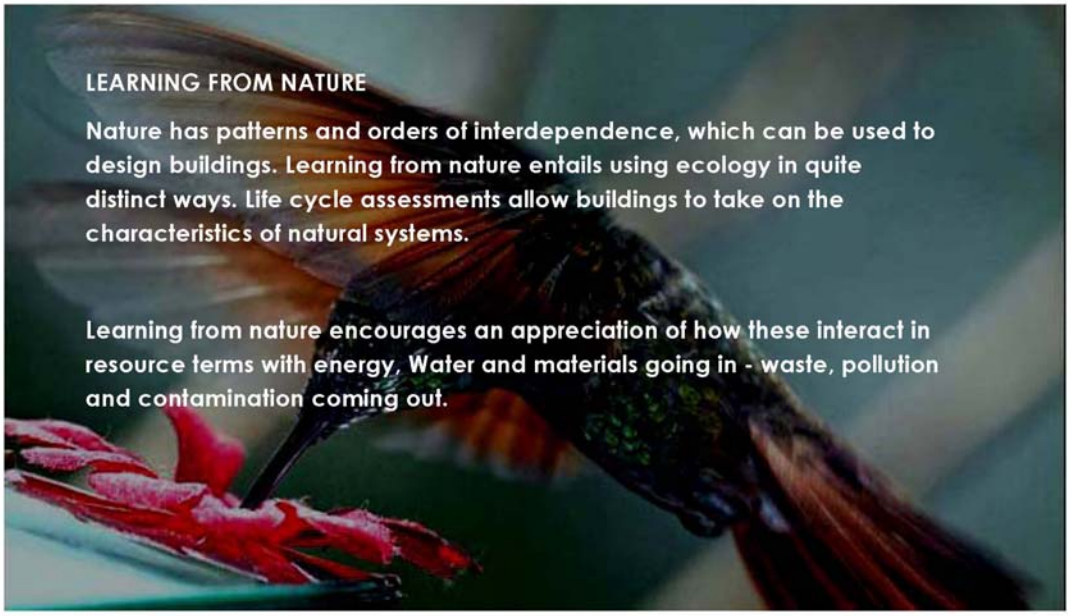
Different designers have learnt to employ natures order in their own fashion. By blending technology and ecology it is possible to generate buildings and cities with reduced environmental impact.

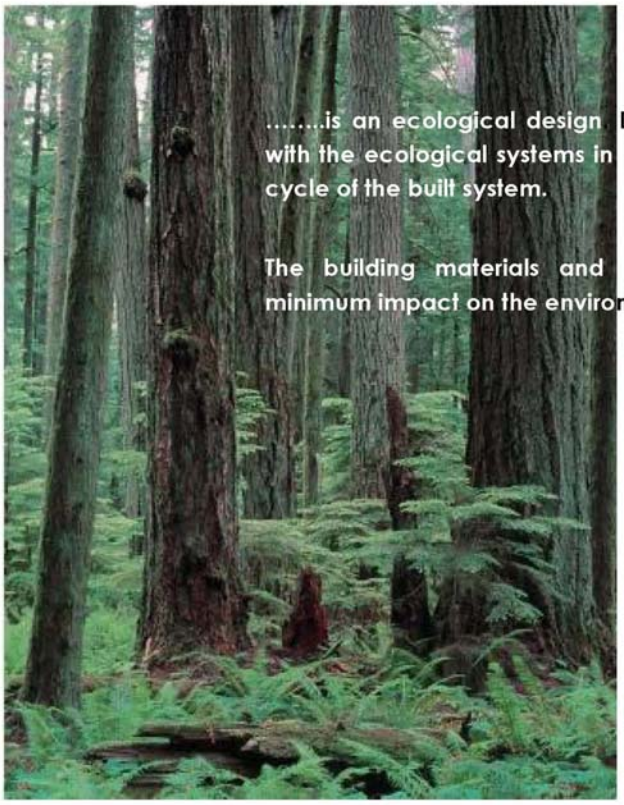
The concept offers architect a new tool in their search for less damaging construction.

LYON AIRPORT STATION

GUFA

FISH SCULPTURE





GREEN ARCHITECTURE

.....is an ecological design. Design that integrates seamlessly with the ecological systems in the biosphere over the entire life cycle of the built system.

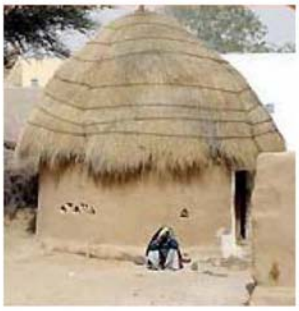
The building materials and energy are integrated, with minimum impact on the environment from source to sink.

GREEN ARCHITECTURE – INDIGENOUS

GREEN ARCHITECTURE - INDIGENOUS

- We would like to combine environmental responsibility and design excellence to prove that sustainability is just not good for the planet but offers architecture new opportunities for creativity and innovation.

- Today, people have become environmental savvy and demand ecological choices a new generation of Architecture and buildings emerging. The increased awareness of building setting, advanced technology and creativity lead to unlimited opportunity for responsive design.



GREEN ARCHITECTURE - INDIGENOUS

- Even from earlier days, the world has practiced the art of building their own structures that turned out to be remarkably practical, sustainable and affordable.

- Nature has provided us with wonderful materials to build within each location

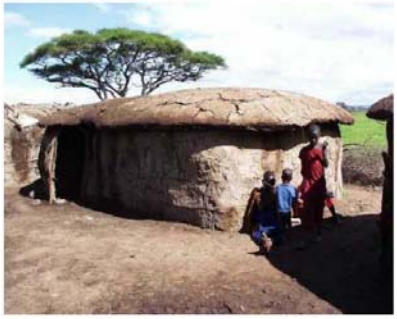
- These require no effort and cost in transporting, processing, involving an alien technology and they are highly suitable and belong to the place. They may even be abundant in supply and inexhaustible and highly renewable. They seem to fit well with the feeling of the place – rationally.

Nature is a source of tactile, visual and aural pleasure. The vernacular tradition is blended instinctively with aspects of social sustainability to forge a soft low-tech green architecture.

INDIGENOUS MATERIALS

- Traditional materials of construction varied from adobe, Rammed earth, straw bale, earth chips, earth sheltering, thin shelled cove domes to timber, stone, brick work, papercrete, earth bags, hybrid structures, recycling.

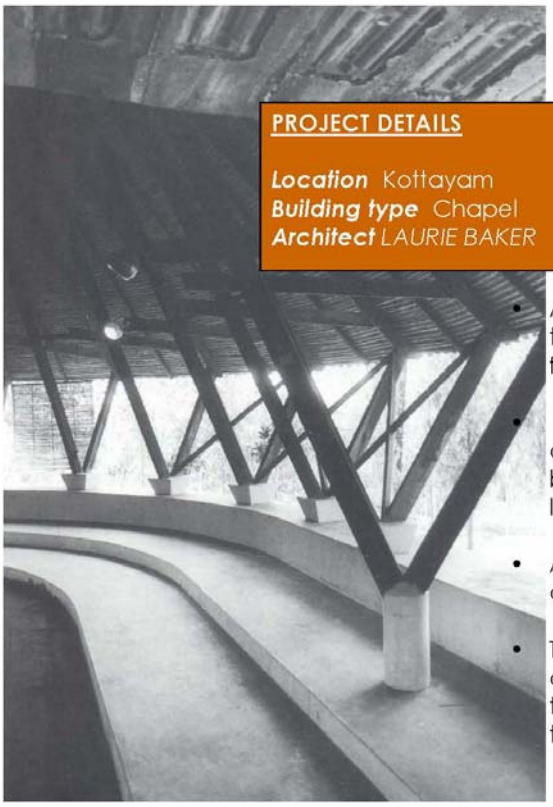
- Scoria – a volcanic stone to pumice, light weight stone with air pockets. This makes it very useful as a natural insulating material. This is also used as an aggregate in cement resulting in strong core.



- Straw bales tight and stringed - Allows the home to breathe

ALTERNATIVE ARCHITECTURE

- A common theme in which much of what is termed as 'alternative' architecture is reunion with nature.
- It is a sympathetic integration with the rural setting.
- The roof is like the protective wings of a bird. A large simple gable with deep overhangs of 1.5m shelters the open spaces below from rain and sun.
- Undressed granite posts, locally available at low cost are integrated with timber and a few pre-cast concrete elements.



CHRISTAV CHAPEL, KOTTAYAM

PROJECT DETAILS

Location Kottayam
Building type Chapel
Architect *LAURIE BAKER*

- A modest structure, this chapel reinterprets the elements of traditional church form in a free and inventive fashion.
- Conventional materials have been adapted to some unusual forms in a building that responds to both its tropical locale and its spiritual function.
- A low horizontal space roofed with a concrete filler slab defines the nave.
- The half-height parapet wall and tiered contour of the floor slab gently modulate the contained space drawing attention to the altar at the centre of the apse.

OUTDOOR DECK

DESIGNING AND BUILDING IN HARMONY WITH OUR ENVIRONMENT....

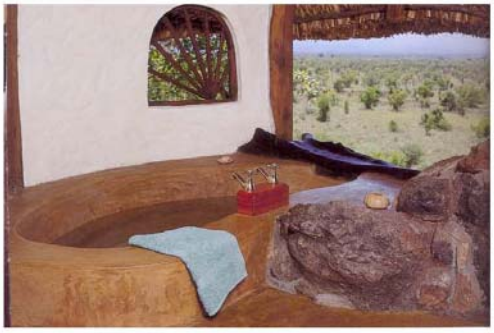
CONNECTING WITH NATURE

When the building is in a more natural setting, connecting with nature brings the designed environment back to life. Effective design helps to inform us of our place within nature.

DOOR DETAIL

INTERIOR OF BEDROOM

•Extensive use of rubble masonry gives natural finish blending with the surrounding nature.



OUTDOOR DECK

•The best possible use of locally available materials saves the cost of transport and involves the skill of locals

RECENT SCENARIO – SEARCHING FOR A RAY OF LIGHT ?

NEW DESIGN STANDARDS FOR GREEN BUILDING

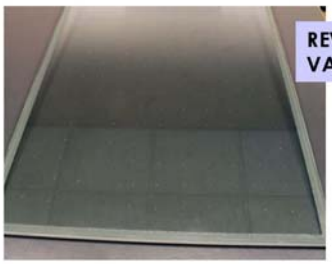
ZERO ENERGY BUILDINGS

A **zero energy building** (**ZEB**) or **net zero energy building** is a general term applied to a building with a net energy consumption of zero. Zero energy buildings are gaining considerable interest as a means to cut greenhouse gas emissions and conserve energy.

Despite sharing the name **zero energy building**, comes with various definitions in practice :

- Net zero site energy use
- Net zero source energy use
- Net zero energy emissions
- Net zero cost
- Net off-site zero energy use
- Off-the-grid

COASTAL FOG TOWER



REVOLUTIONARY SUPER-INSULATING VACUUM GLASS

MIAMI ART MUSEUM

GREENPIX ZERO ENERGY MEDIA WALL

•This Media Wall features the largest color LED display worldwide. There is photovoltaic system that is integrated into this glass curtain wall, thereby becoming a zero energy wall .

MASDAR HEADQUARTERS, DUBAI

•Not settling for mere zero-energy, Masdar Headquarters are setting new design standards for green building, with their scheme that generates more energy than it consumes.

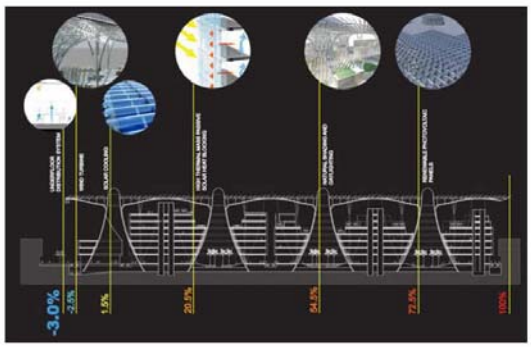
•The Masdar Headquarters building outside of Abu Dhabi is also the first building in history to generate power for its own assembly, using a solar roof pier that will be built first to power the rest of the construction.

•The building's aggressive approach to sustainability enables it to offer the lowest energy consumption per square meter for its class

• The complex will utilize sustainable materials and feature integrated wind turbines, outdoor air quality monitors.

•Compared with typical mixed-use buildings of the same size, the Headquarters will consume 70 percent less water.

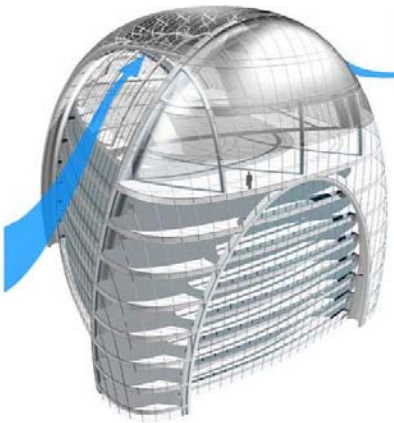
•In addition to serving as the Masdar Headquarters, the building will accommodate private residences and 'early bird' businesses starting up in the city.



PREFAB FRIDAY: ZEROHOUSE SHOWS NOTHING IS EVERYTHING

A complete self-sufficient home that produces its own energy, water, and is completely customizable.

FEATURES: The answer to all of our zero-energy prefab dreams with the new ZeroHouse. This completely self-sustaining prefabricated house generates its own power, collects its own water, processes its own waste and is 100% automatic. Versatile, durable and site-sensitive, ZeroHouse can be erected in almost any location in one day with steel frame components and a helical-anchor foundation system that requires no excavation.



THE CLEAN TECHNOLOGY TOWER

•A Clean Technology Tower in Chicago that takes a multi-generative approach to producing its own energy.

•Harnessing an atrium of wind turbines beneath a roof-top solar shell, the building "utilizes advanced technologies and climate-appropriate building systems to foster a symbiotic relationship with its local environment."

•More than just a showy face, the tower's aerodynamic front funnels wind through turbines that are strategically located at the corners and roof of the structure.

•These placements maximize wind velocity, which drives the turbines to generate power and ventilate the tower's interior.

•A transparent solar roof tops the structure off, ready to soak up the southern sun.

GREEN BUILDING ORGANIZTION

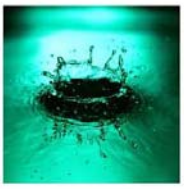
Green building brings together a vast array of practices and techniques to reduce and ultimately eliminate the impacts of buildings on the environment and human health. They require careful, systematic attention to the design of the buildings.

Many countries have thus developed their own standards of energy efficiency for buildings.

LEED-INDIA

LEED-INDIA promotes a whole-building approach to sustainability by recognizing performance in the following five key areas:

- **Sustainable site development**
- **Water savings**
- **Energy efficiency**
- **Materials selection and**
- **Indoor environmental quality**
- **Innovation**



LEED RATING

The Leadership in Energy and Environmental Design (LEED) Green Building Rating System is the internationally accepted benchmark for the design, construction, and operation of high performance green buildings.

GREEN BUILDING LEED RATING SYSTEM

S.No	Credits	New building	Existing building
1	Sustainable sites	13	14
2	Water efficiency	6	6
3	Energy and Atmosphere	17	14
4	Materials and resources	13	11
5	Indoor Environmental quality	15	11
6	Innovation and Accredited Professional points	5	5
	Total	69	61

CERTIFIED - 26-32 PTS
SILVER - 33-38 PTS
GOLD - 39-51 PTS
PLATINUM - 52-69 PTS

CREDITS – SUSTAINABLE SITES

- **SUSTAINABLE SITES (13 POINTS)**
  - **Site Selection, Alternate transportation, Development density, Storm water management, Reduced site disturbance, Heat Island effect, Light pollution Reduction, Brownfield Redevelopment.**
  - **STANDARDS**
    - Illuminating Engineering Society of North America (IESNA) manual for light pollution reduction

GREEN SITING AND LAND USE

SITE SELECTION
Development on sites that are: agricultural; in the 100-year flood plain; subject to landslides, erosion or wildfires; habitat to endangered species; wetlands are not to be disturbed.

ALTERNATIVE TRANSPORTATION
Pollution and land development impacts from car use can be reduced by locating buildings near transit, providing bicycle amenities, encouraging carpooling, and providing alternative fueling stations.

REDUCE SITE DISTURBANCE
Existing natural areas are to be conserved and damaged areas to be restored to provide habitat and promote biodiversity.

LIGHT POLLUTION REDUCTION
Light trespass from the building site to be eliminated and night sky access to be enhanced

CREDITS – WATER EFFICIENCY

- **WATER EFFICIENCY (6 POINTS)**
  - **Waste water management, Water efficient landscaping, Water use reduction, Water efficiency in Air-Conditioning.**

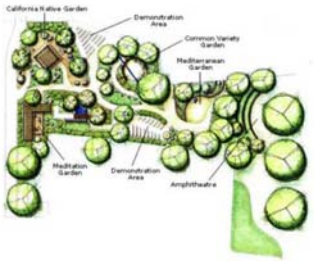
STANDARDS & GUIDELINES

- EPA standard or local codes, whichever is stringent

STORMWATER MANAGEMENT

Disruption of natural water flows to be limited by eliminating storm water runoff, increasing on-site infiltration and reducing contaminants. Impervious surfaces to be minimized and groundwater recharge to be executed.

Campus development



WATER EFFICIENT LANDSCAPING

Potable water should not be used for irrigation. Xeriscaping and high efficiency irrigation technologies, including drip irrigation, rainwater capture, grey water can be adopted.

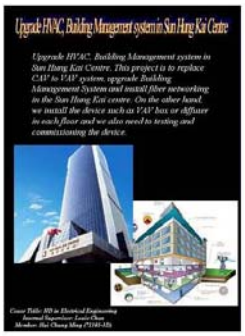
WATER USE REDUCTION

Water efficiency within buildings to be maximized to reduce the burden on municipal water supply and wastewater systems. Water-efficient fixtures and equipment to be specified.

CREDITS – ENERGY EFFICIENCY

daylight in Technology Centre

- **ENERGY (17 POINTS)**
  - **Fundamental Building System, Minimum Energy Performance, CFC Reduction in HVAC & RE Equipment, Optimizing Energy Performance, Ozone Depletion, Energy use reduction, Renewable energy, Green Power, M&V, Additional commissioning**
  - **STANDARDS & GUIDELINES**
    - IPMVP
    - ASHRAE 90.1-1999
    - VISUAL DOE Software for energy simulation
    - Green –e Programme



STATE – OF – THE – ART BMS

- Monitoring
  - Air-conditioning
  - Fans
  - Pumps
  - Lighting
- M & V (Monitoring & Verification)
  - Updation of baselines
- Scheduling of equipment operations

BUILDING COMMISSIONING

Whether the building is designed, constructed, and calibrated to operate as intended with third party quality control assurance, to be verified.

ELIMINATE HCFCs

Ozone depletion to be reduced to the possible extent by installing building level HVAC and refrigeration equipment and fire suppression systems that do not contain HCFCs.

RENEWABLE ENERGY

Energy self-sufficiency to be promoted and reliance on limited fossil fuels should be minimized by incorporating on-site renewable energy sources such as solar, wind, geothermal and biomass.

- UV Values of walls, roof and glass have to be checked
- Efficient usage of these is very much necessary.

SOLAR WATER HEATER

SOLAR SHADES

Type	ASHRAE 90.1 - 2001 (W/Sq.m ° K)	CII-Godrej GBC (W/Sq.m ° K)
Double Glazed Glass	6.91	1.7
Roof	3.57	0.294
Wall	3.28	0.57

CREDITS – MATERIALS AND RESOURCES

- **MATERIALS AND RESOURCES (13 POINTS)**
  - **Building Reuse, Recycled content, Resource reuse, Regional materials, Rapidly renewable material, Certified wood, construction waste management.**
  - **STANDARDS & GUIDELINES**
    - FSC Certified woods
    - ASHRAE 52.2-1999 for construction IAQ

LOCAL MATERIALS

- More than 90% materials should be sourced locally.
  - Cement
  - Steel
  - Bricks
  - AAC Blocks
  - Aluminum
  - Tiles
  - Others

RECYCLING/RECYCLED CONTENT

Occupant recycling of waste should be provided for. Products that contain recycled material to be used.

LOCAL/REGIONAL MATERIALS

Materials that are harvested, extracted and manufactured regionally must be specified and recommended.

RAPIDLY RENEWABLE METERIALS

Rapidly renewable materials such as straw, bamboo and some woods must be specified.

CERTIFIED WOOD

Wood from certified sustainably managed forests should be specified.

STRAW

BAMBOO

THATCH

BAMBOO

EARTH BLOCKS

BUILDING REUSE

The life cycle of building stock should be extended, resources to be conserved, cultural resources to be retained, waste to be reduced, environmental impact of new buildings to be reduced.

RESOURCE REUSE

Salvaged or refurbished materials such as wooden flooring/paneling/cabinets, doors and frames, mantels, ironwork, decorative light fixtures, can be specified.

ORNAMENTAL DOOR RE-USED

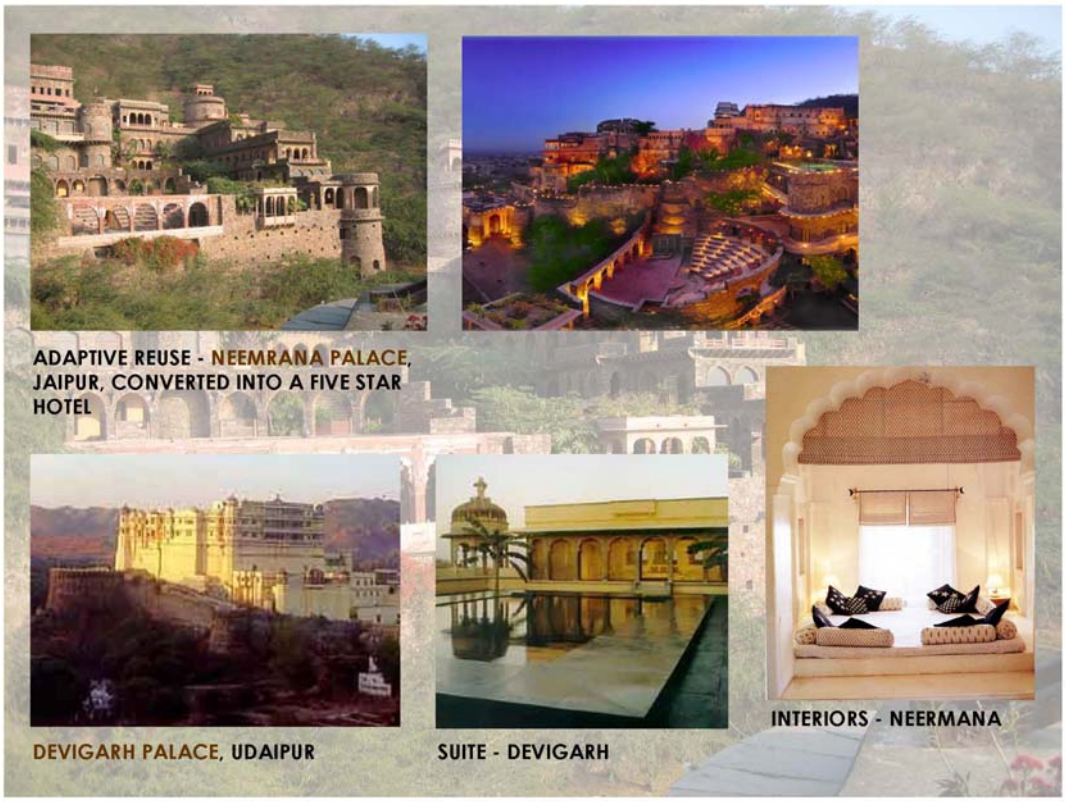
ORNAMENTAL BRACKETS RE-USED

RE-USED WOODEN FURNITURE

ARCHITECTURAL ELEMENTS RE-USED

ECO FRIENDLY TOILET

USE OF LOCAL MATERIALS FOR CONSTRUCTION



CONSTRUCTION WASTE MANGAGEMENT

- Recycling of construction waste debris (>50%)
  - Brick, masonry waste, concrete
    - Filling up of Undulated site areas
  - Paint cans
    - Recycling
  - Cement bags
    - Reuse
  - Packing materials
    - Recycling

CREDITS – INDOOR ENVIRONMENTAL QUALITY

- **INDOOR ENVIRONMENTAL QUALITY (15 POINTS)**

– **Minimum IAQ Performance, ETS Control, Controllability of system, outdoor air delivery monitoring, Construction IAQ, Low emitting materials, Indoor chemical pollutant source control, Day lighting & views, Thermal comfort, increased ventilation.**

– **STANDARDS & GUIDELINES**

- ASHRAE 52.2-1999 for construction IAQ
- Materials Safety Data Sheet (MSDS) – for low emitting materials
- ASHRAE 55-1992 – thermal Comfort

CARBON DIOXIDE MONITORING/EXHAUST

Independent system to be installed or a function of building HVAC system to be made.

ASSURE VENTILATION EFFECTIVENSS

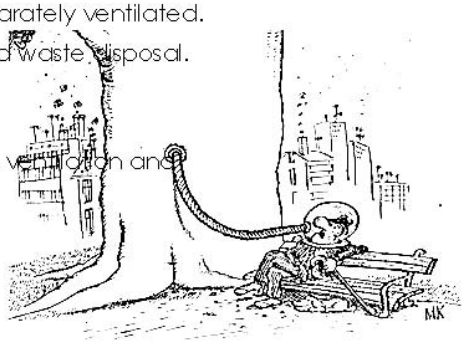
Architectural and HVAC design strategies must be employed to increase ventilation effectiveness and prevent short-circuiting of airflow delivery. Under floor HVAC and operable windows can be considered.

INDOOR CHEMICAL and POLLUTANT SOURCE CONTROL

Entry grates to be installed to capture dirt. Areas of chemical use and storage should be segregated and separately ventilated. Appropriate plumb drains to be used for liquid waste disposal.

CONTROLLABILITY OF SYSTEMS

A high level of individual control of thermal, ventilation and lighting systems to be provided.



CREDITS – INNOVATION

- **INNOVATION IN DESIGN (5 POINTS)**
  - Exemplary performance, innovation in design.
  - Credits not addressed by LEED – Should have impact on energy or environment
  - LEED accredited professional

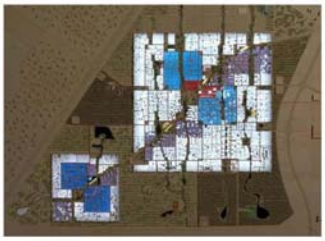
URBAN REDEVELOPMENT

Channel development to be done to urban areas with existing infrastructure, protecting green fields and preserving habitat and natural resources.

MASDAR CARBON NEUTRAL CITY DEBUT

Masdar City is poised to become world's most sustainable, zero-waste, car-free, carbon neutral city.

The city is going to be built on an area of six square kilometers on the outskirts of Abu Dhabi.



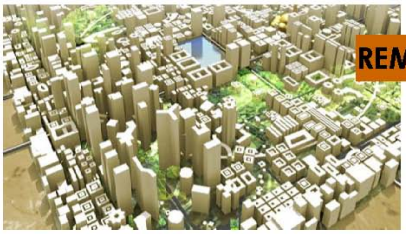
The electricity for the entire city would be generated by solar energy harnessed by photovoltaic panels.

- As for site planning, the city would be oriented north-east to south-west to ensure optimum balance of sunlight and shade.

- There would be no cars zooming around the city, with residents getting to and from via trains and automated transport pods.

- Three levels for movement for the city would include a light railway between Masdar to Abu Dhabi, a second level for pedestrians, and a third for "personalized rapid transport pods."

- Systems would encourage reuse and minimal resources, with 99% of the waste generated in the city getting reused, or composted, and all waste water would be reused as well, with solar energy desalination systems.



REM KOOLHAAS' RAS AL KHAIMAH'S ECO CITY

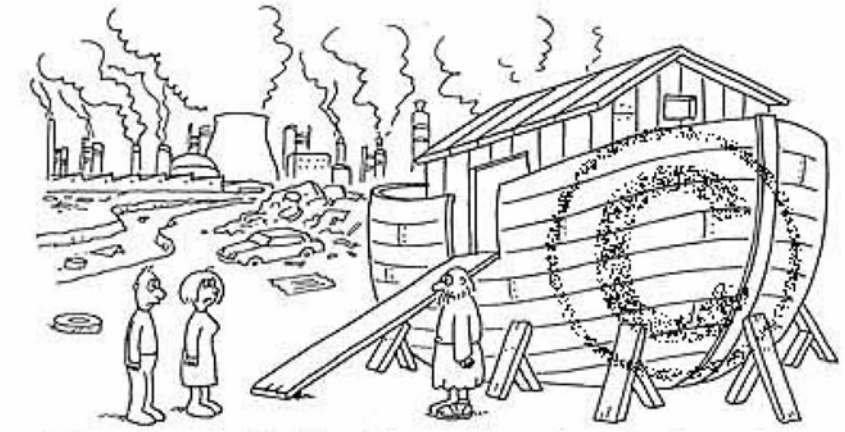
A new **UAE ECO-CITY** in the United Arab Emirates. Entirely sustainable and caters to residents' every conceivable whims within its four walls. **DESIGNED BY REM KOOLHAAS'S** OMA office.

FEATURES: Cutting Edge solar technology will power the 1.2 million square meter city, built using locally-sourced Arabian materials and aesthetic styles to support the city's overall ethos of sustainability.

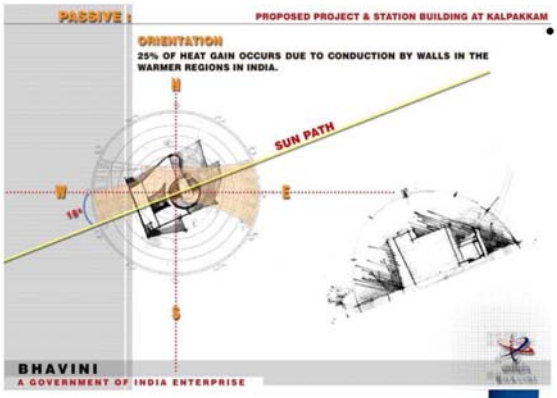
DAEKWON PARK'S SUPERSTRUCTURE FOR SUSTAINABLE SKYSCRAPERS

Future-forward architecture to its breaking point, unveiling a stunning array of new structural concept.

FEATURES: It is modular, prefabricated, and completely symbiotic on the existing vertical infrastructure of the city.



"There is nobody else. I'm afraid we've wiped out all of the other species."



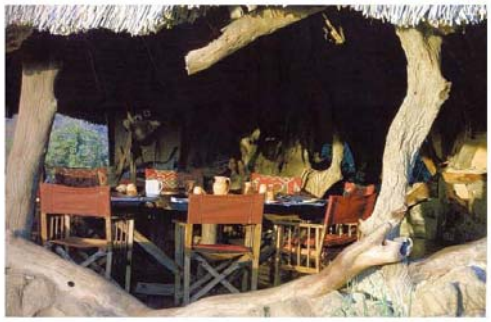
GREEN ENERGY AND ATMOSPHERE

Energy Performance optimized through siting, orientation, building form, insulation, glazing, daylighting, and controls. Performance with energy modeling programs to be studied. Practice integrated design including all parties of the project from inception.

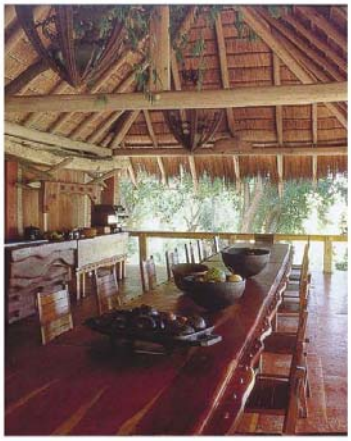
ORIENTATION

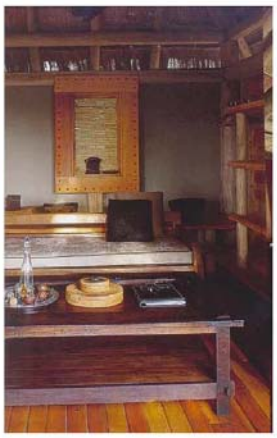
25% of the heat gain occurs due to conduction of walls in the warmer regions of India.

- Eco-tourism projects , Andhra Pradesh and Kerala
- Animal & Bird sanctuary , Andhra Pradesh



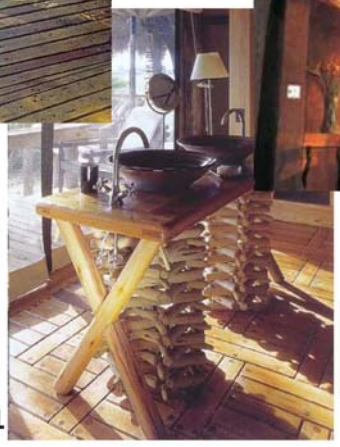
JUNGLE LODGE





ECO-TOURISM PROJECT

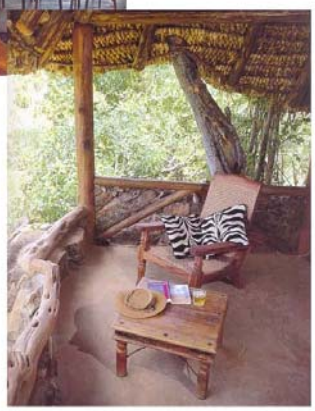
VIEW OF INTERIOR



WASH BASIN
STAND DETAIL

USE OF INDIGENOUS MATERIALS TO GIVE A SENSE OF PLACE AND BELONGING ....

RESIDENTIAL SUITE



BALCONY DECK

VEDHAPATASHALA

2. The cost is effectively controlled by the use of simple traditional material like terracotta floorings, exposed brick work

1. The design of **VEDAPATASHALA** and **NAMASANKEERTHANA PATASHALA** is based on the traditional vedhic architecture.

- The profiles of the plans and the three – dimensional markings of the structure is all traditional with courtyards, verandahs and mandapams.
- **Austerity is the main theme**

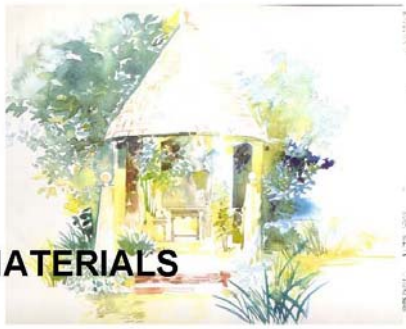
EXISTING ENTRANCE ARCH FOR STERLING RESORTS, YERCAUD

- This has zero maintenance. If it becomes dirty, dusty catches moss or if weeds grow, the sculpture would become more alive.
- Probably after a few years, the tourist guides will make this as one of the sight seeing spot, describing this as a natural wonder.

- This is the least expensive archway built with the boulders at site suggestive of two birds or two animals having a dialogue between a mother and child.
- Instead of a linear archway, the visitors are guided through the stone sculptures

OUR PROPOSAL FOR THE SAME

- **The design was done with great concern to environment without digging or filling.**
- **The rubbles obtained in forming the roads were used in building the resort.**
- **The resort takes the same curvature along the contour of the hills and forms part of the hill.**



USE OF LOCAL MATERIALS

- Entrance Archways made out of discarded boats and boat house scrap

ADAPTIVE REUSE

GREEN DEVELOPMENTS

IT NUGAMBAKKAM

SEZ - SRIPERUMBUDUR

IT PERUNGUDI

DESIGN FEATURES

- All these buildings are designed to be green
- The increase in capital cost is about 5-10%.
- The average reduction in power consumption is about 30 – 40%
- The average reduction in water consumption is about 30 – 40%
- The period of recurring the initial cost is 2 to 5 yrs.

OUR RECENT PROPOSALS FOR IT PARKS

O L Y M P I A TECHNOLOGY PARK, GUINDY

Olympia Technology Park located in Guindy, Chennai is 1.8 million sq.ft.

We have been involved in this project also as Green Building Architects and had interacted with the Consultants, CII and also the energy modeling team .

This has compiled with the following criteria of LEED rating:

- Sustainable sites
- Water efficiency
- Energy and Atmosphere
- Materials and resources
- Indoor Environmental quality
- Innovation and Accredited Professional points

This technology park as a Green Building embodies not only an intelligent approach to IT Park design, but also has used the most efficient equipments in realizing this project.

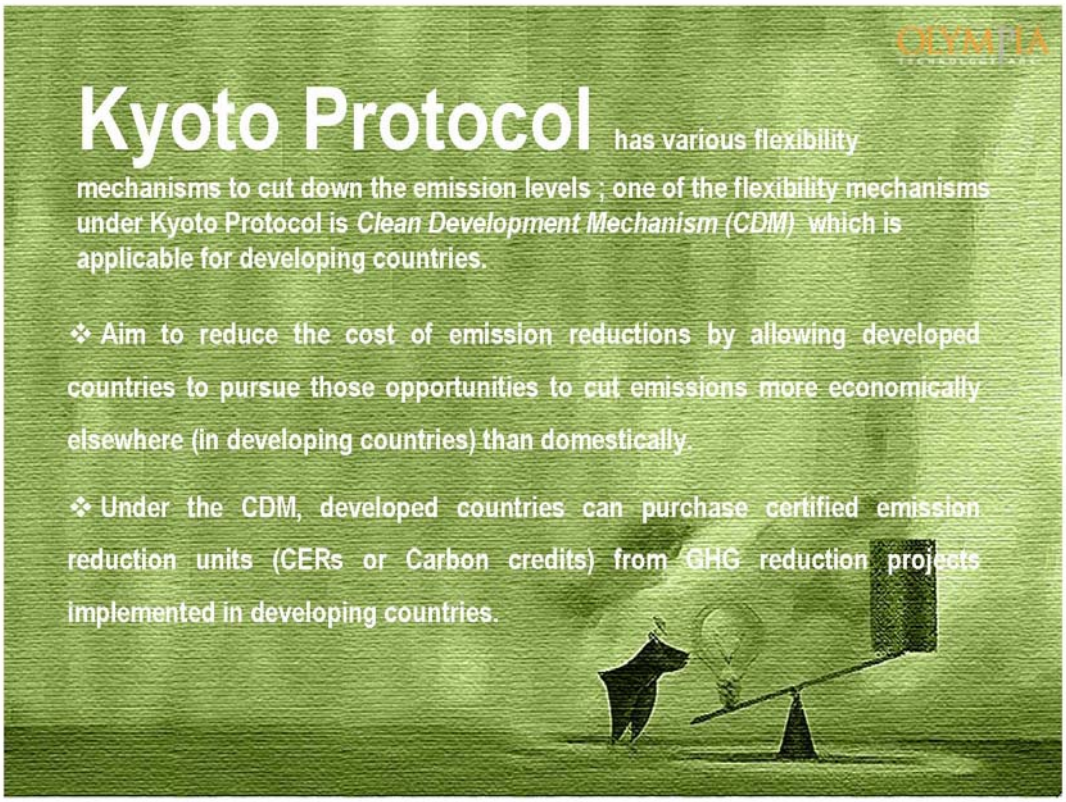
FINAL ANALYSIS

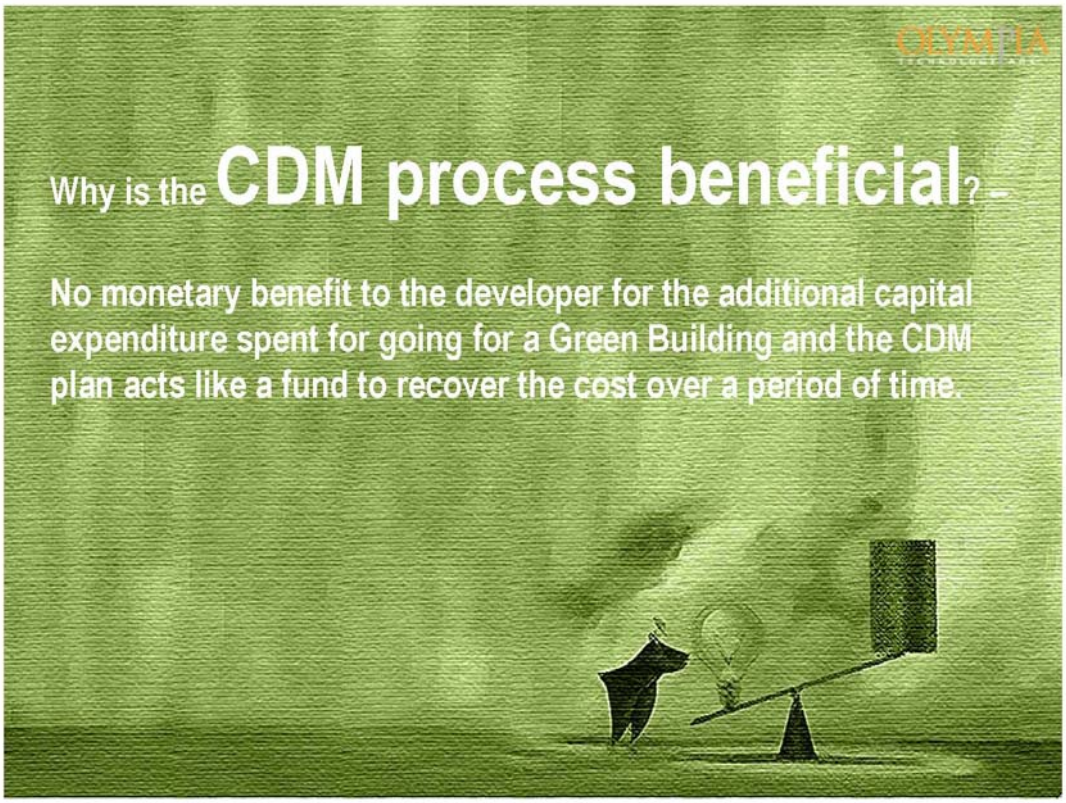
1 Summary of Results

The purpose of the study is to predict the performance of the existing design of the building in comparison to a conventional typical building with same occupancy type in the same region. A number of energy conservation measures (ECMs) were analyzed to arrive at a package of recommended measures. With these measures the proposed building can achieve **45.4%** improvement over the typical budget building.

Table 1 Energy Use Comparison –Typical building Vs Final case

Case Description	Lighting	Equipment	Cooling	Tower	Pumps	Fans	Energy Use (kWh/yr)	Energy Use excluding the equipment	% savings over Typical Building
Typical Building	8,492,118	11,061,460	30,659,350	0	2,198,759	11,145,400	63,557,070	52,495,610	
Proposed Building	7,813,682	11,061,460	18,957,960	0	397,310	1,494,139	39,724,550	28,663,090	45.4


Kyoto Protocol has various flexibility mechanisms to cut down the emission levels ; one of the flexibility mechanisms under Kyoto Protocol is Clean Development Mechanism (CDM) which is applicable for developing countries.
❖ Aim to reduce the cost of emission reductions by allowing developed countries to pursue those opportunities to cut emissions more economically elsewhere (in developing countries) than domestically.
❖ Under the CDM, developed countries can purchase certified emission reduction units (CERs or Carbon credits) from GHG reduction projects implemented in developing countries.


Why is the CDM process beneficial? –
No monetary benefit to the developer for the additional capital expenditure spent for going for a Green Building and the CDM plan acts like a fund to recover the cost over a period of time.

Why should a GREEN BUILDING get Carbon Credits?

Green Building projects focus on "Energy Conservation" which leads to drawal of lesser amount of electricity from grid, which in turn reduces thermal power generation from fossil fuels.

Reduction in thermal power generation from fossil fuels results in conservation of natural resources and
REDUCTIONS IN CARBON-DI-OXIDE – A GREEN HOUSE GAS causing GLOBAL WARMING.
A general benchmark is 1 kWh → 0.7~0.9 kg CO_2
(This factor depends on the Regional grid connected to the project activity).

Major Drivers of Clean Development Mechanism

- ✓ Improved Brand Image
- ✓ Additional Revenue for the CAPEX spent
- ✓ Leads to a sustainable development
- ✓ Meets the global goal on climate change mitigation

Since India is culturally fertile, Green Architecture can grow well on its deep cultural roots. It could even be a role model for global trend.

Does the nature belong to us or do we belong to nature?
All of us would agree that we belong to it and hence we have to nurture it.

Today we have to accept that we cannot continue living and inheriting from our forefathers while borrowing and mortgaging the future of our children.

If it is true that we love and care for our children and grandchildren, then it is inevitable that we should love and care for nature also.


YES THE WHOLE WORLD IS 'GOING GREEN' !
save earth
GO GREEN
Global Warming is... NOT COOL!
Go Green, I did!!
Save the EARTH. It's the only planet with Beer!
Stop Killing Whales
HELP MOTHER EARTH SURVIVE
STOP OIL POLLUTION
GREEN IS KEEN!
"It's Your Move!"
Go Green
IT'S FREE TO BE GREEN
GIVE BACK TO NATURE WITH ONE QUICK CLICK
SAVE MONEY & THE PLANET
together we can save the earth
Stop Pollution
Go GREEN!
Your World, Your Voice
SAVE THE PLANET
SAVE OURSELVES

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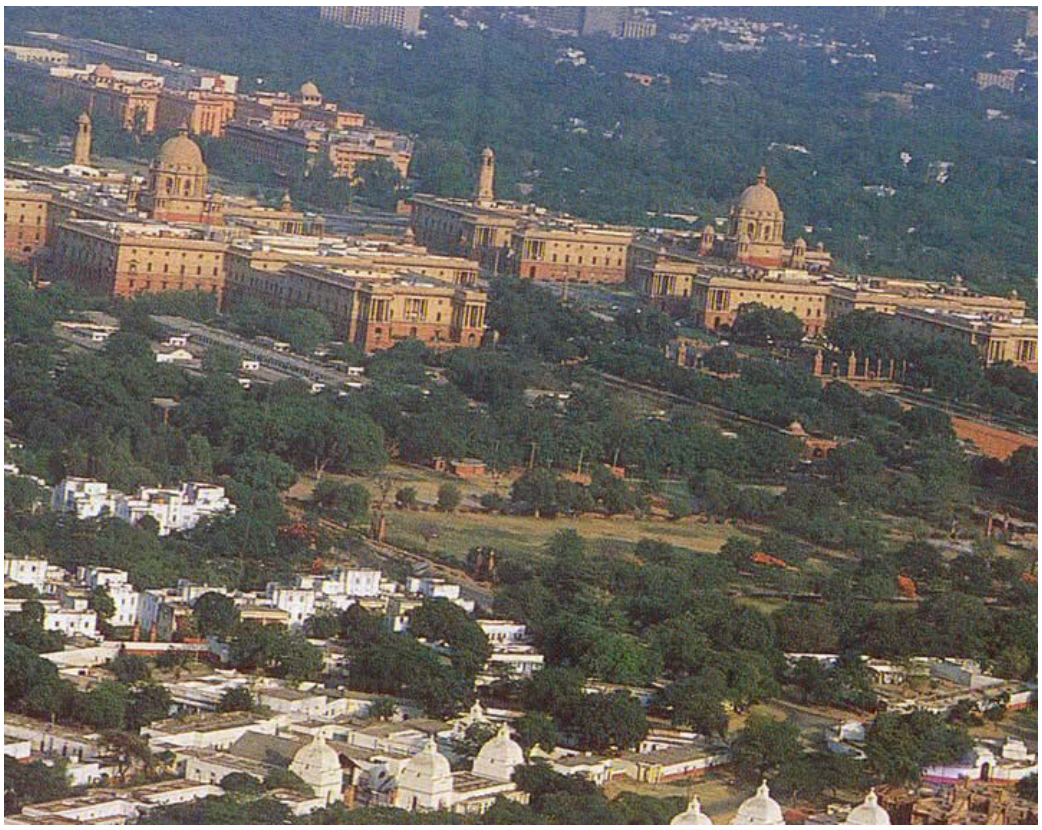
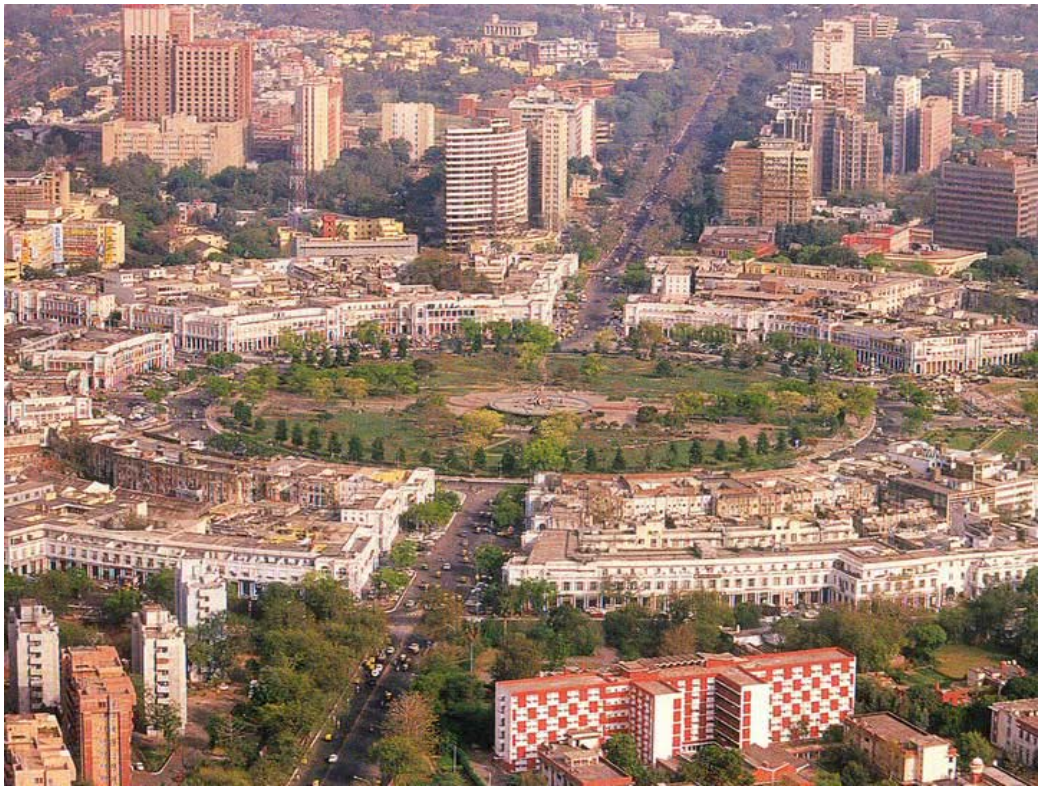
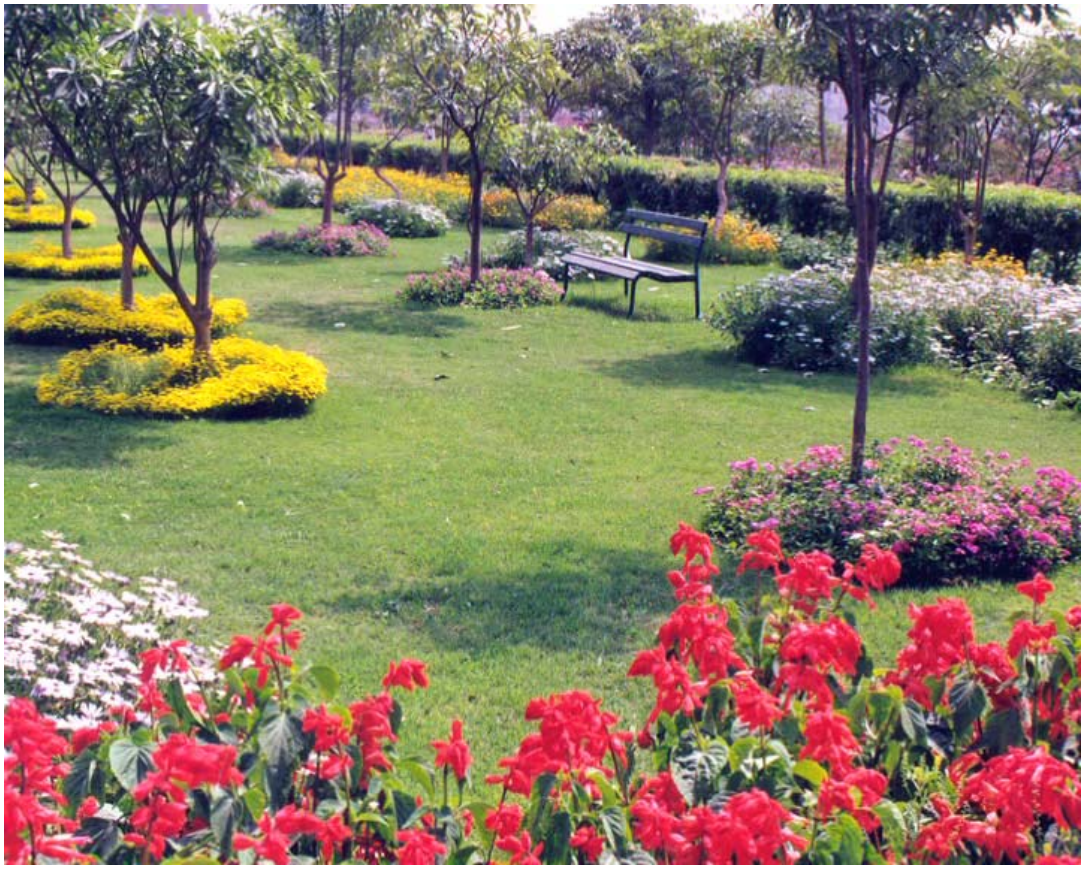
Session - VI

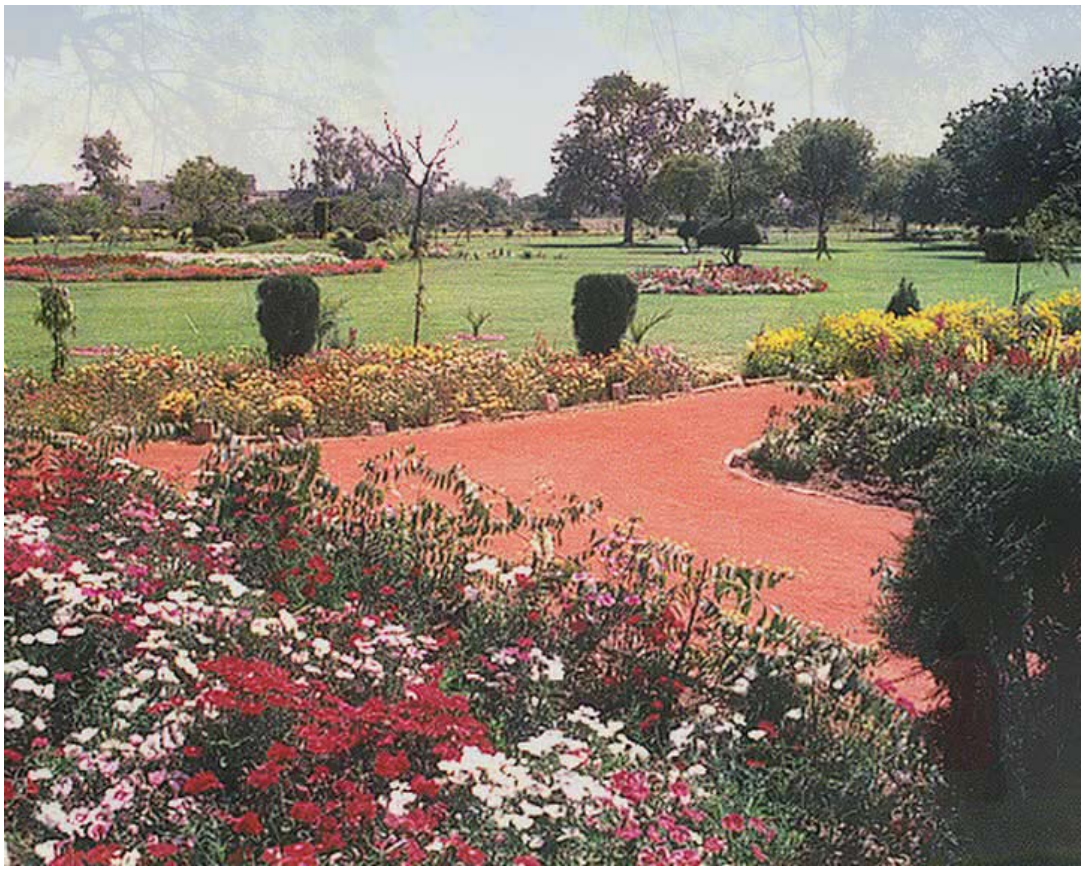
DDA Land Scape

Tmt. Savita Bhandari,Director(Landscape),
Delhi Development Authority, New Delhi.

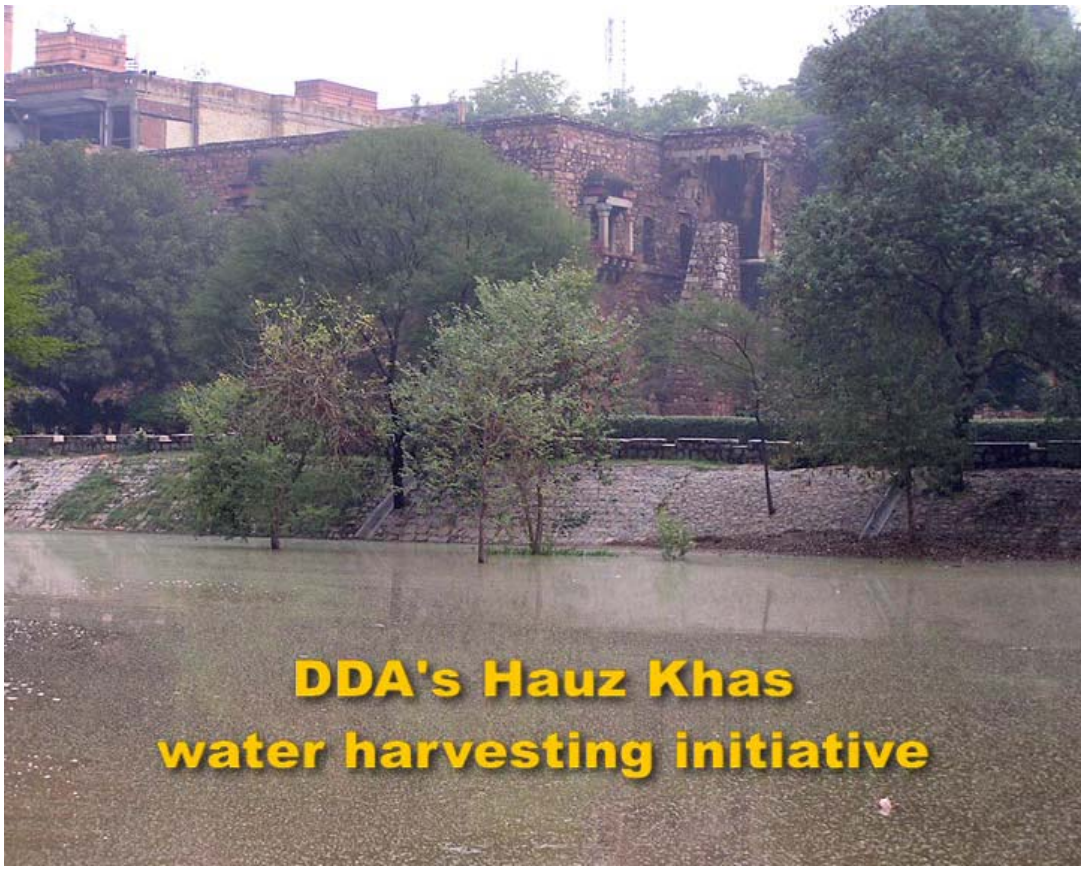









Northern Ridge


DDA's Hauz Khas
water harvesting initiative


DDA's Vasant Kunj
water harvesting initiative


A single tree evaporates over
500 litres of water a day


260 million tons
20 million trees
6 million ton


Aastha Kun


Indraprastha Park


Indraprastha Park


Indraprastha Park


Swarna Jayanti Park


Swarna Jayanti Park


• टि • वि • प्रा •
PICNIC
HUT
NKING WATER
कनिकहट
पीने का पानी


Swarna Jayanti Park


Aravali Bio Diversity Park

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