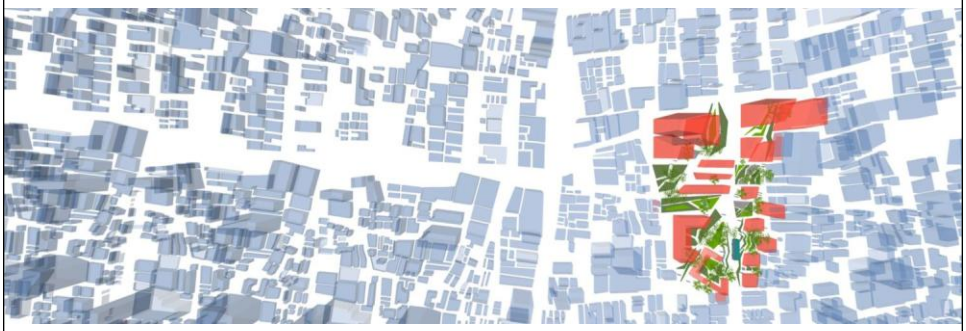
GRIHA LD

GRIHA for Large Developments



Apoorv Vij
Association for Development and Research of Sustainable Habitats
National Conference on Green Design
15th February 2013

2005

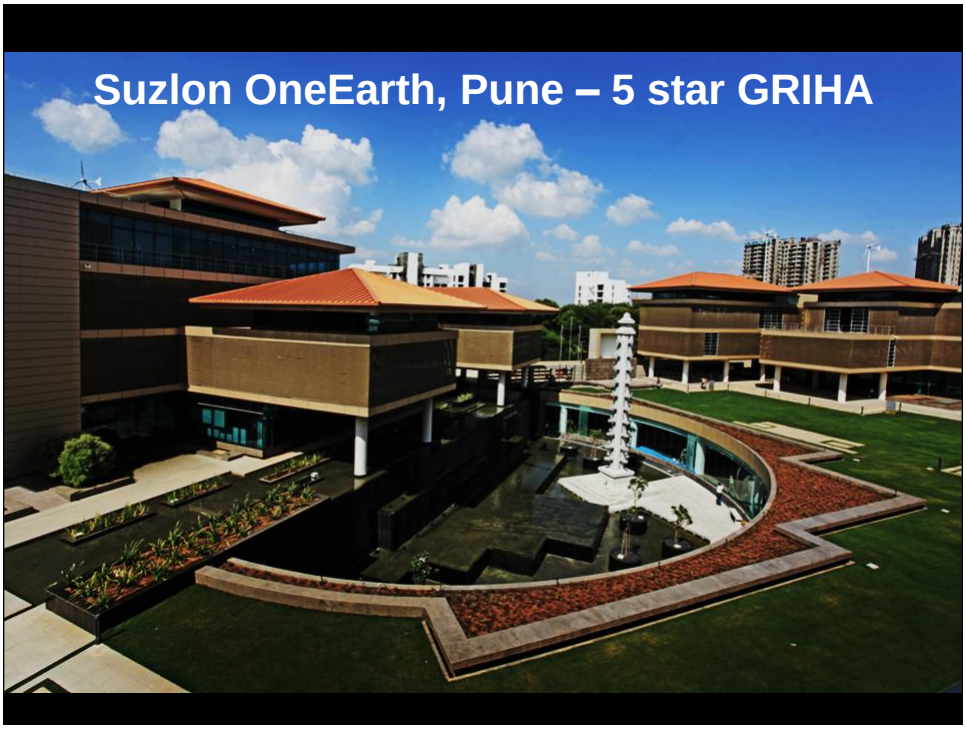
Genesis

TERI-GRIHA

2007

Going National

GRIHA



2012

GRIHA for you and me

SVA GRIHA

Simple Versatile Affordable GRIHA


Source: http://v23.lscache1.c.bigcache.googleapis.com/static.panoramio.com/photos/original/16384620.jpg

2013

Looking at the big picture

GRIHA LD

GRIHA for Large Developments

Background

According to the 12th Five Year Plan, released by the Planning Commission of the Government of India, nearly 285 million people were living in urban agglomerations.

This number increased to almost 380 million in the year 2011.

And the projections are that by 2030, almost 600 million people will be living in urban areas.

Projects which can be rated under GRIHA LD

All projects which satisfy either of the following two thresholds may apply for a GRIHA LD rating:

- Total built up area greater than or equal to 1, 50,000 sq.m; and/or
- Total site area greater than or equal to 50 hectares.

Projects which can be rated under GRIHA LD

1. Large (mixed–use) townships:
   - Housing complex by builders
   - Housing complexes by urban development organizations
   - Housing board and Public Sector Undertaking Townships
   - Plotted developments with part construction by the developer
2. Educational and institutional campuses
3. Medical colleges and Hospital complexes (eg: AIIMS)
4. Special economic zones
5. Hotels/ resorts

Different in Approach

Green habitats are those which reduce their detrimental impact on the environment

Conventional Rating System	GRIHA LD
The higher the points, the higher the rating	The lower the detrimental impact, the higher the rating

Overall Impact - I_t	Rating
75 % - 66 %	1 star
65 % - 56 %	2 star
55 % - 46 %	3 star
45 % - 36 %	4 star
35 % or lower	5 star

The rating of the projects will be done in parts:

- Design Stage Rating
- Rating of Each Subsequent Stage

Sections

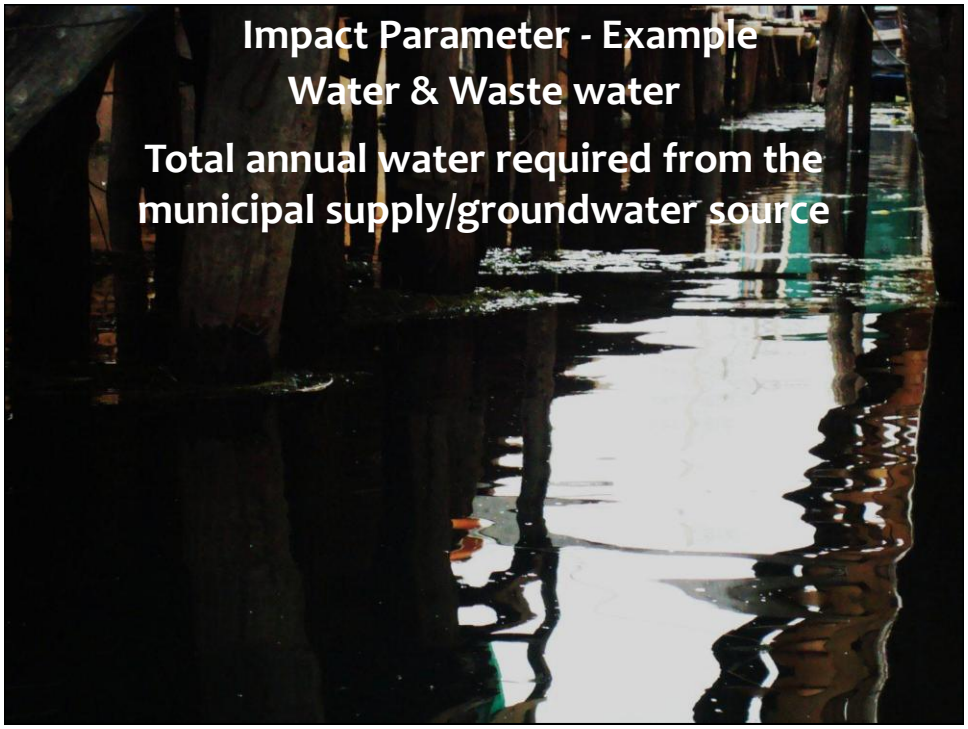
- The impact of the development is analysed across 6 sections, which are:
  - Site Planning
  - Energy
  - Water & Waste Water
  - Solid Waste Management
  - Transport
  - Social

Impact in each section

The impact in each section is evaluated in two parts:

- Quantitative parameters – how much?
- Qualitative parameters – how good/bad?


Carrying Capacity
only indicative
Water availability to support the population
9 sqm green cover per capita
Per capita CO_2 emissions to be less than 1.18 tonnes per annum (India's national average)

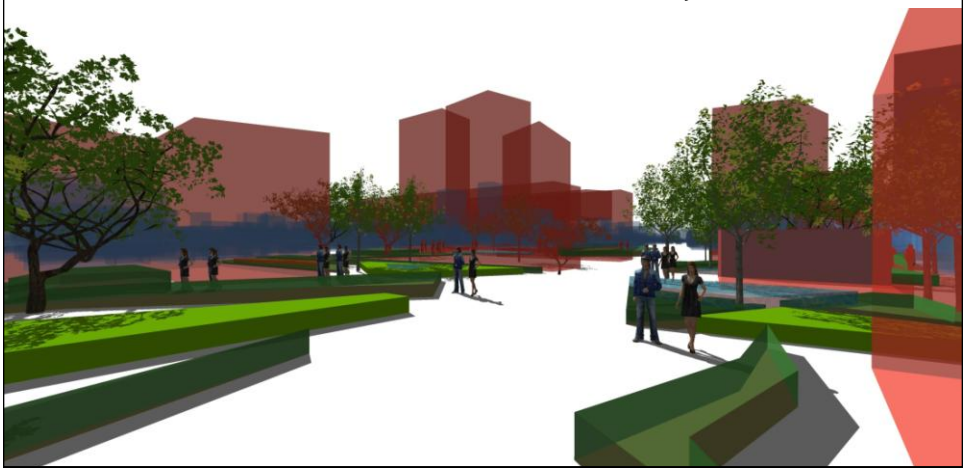

Impact Parameter - Example
Water & Waste water
Total annual water required from the municipal supply/groundwater source

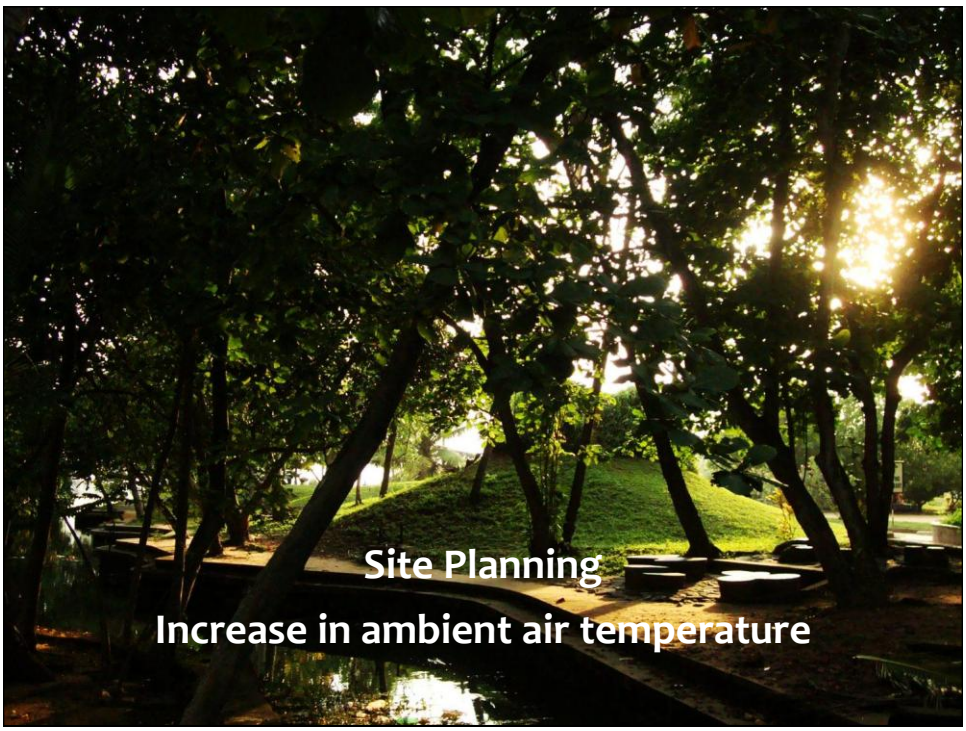
Water demand – (D)

- Total water required by buildings on site – NBC – lpcd
- Total water required for landscape on site

Water Reuse – (S)

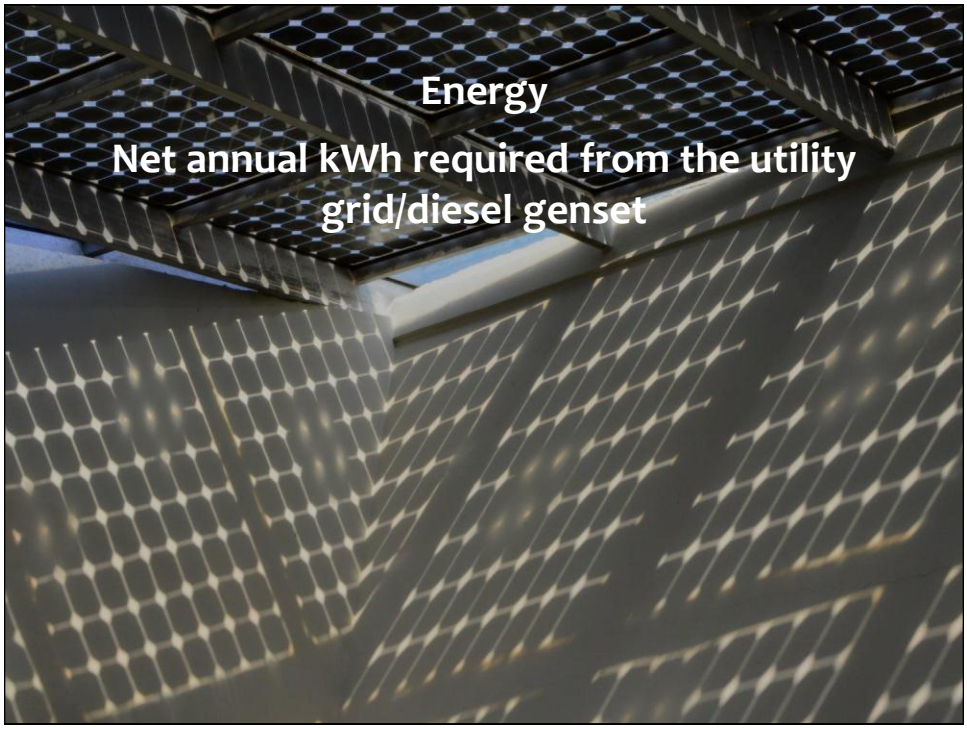
- Rainwater that is captured, stored and reused after filtration
- Waste water that is recycled and reused





Site Planning

Increase in ambient air temperature


Energy
Net annual kWh required from the utility grid/diesel genset


Solid Waste Management
Total organic waste treated on site

Qualitative Parameters

In addition to the quantitative impact parameter, each section has been assigned several qualitative parameters as well.

Qualitative Parameters – Example - Transport

- Provision of footpaths and bicycling tracks and for safe interaction of NMT traffic with motorized traffic
- Road network planning
- Provision of collective transport services
- Disincentivising parking for cars and two wheelers
- Electric charging infrastructure for vehicles

Qualitative assessment parameters for Social

- Facilities for construction workers
- Social infrastructure in development
  - Universal accessibility
  - Environmental awareness
  - Resting facilities for service staff
- Planning for low-income group population
  - EWS housing
  - Dedicated health and education centers
  - Provision for informal markets

Normalizing Multipliers

Additionally, each section has been assigned a "normalizing multiplier" to reflect :

- different national priorities revolving around resource scarcity
- relative variation in investment for different strategies
- balance between social, economic and environmental aspects; and
- balance between Quantitative parameters and Qualitative parameters

Final Design Impact - Quantitative

Section	Quantitative Impact (from 0 to 100%) (Qn)	Normalizing multiplier (M)	Final impact score
Site Planning	100	0.9	I_n
Energy	100	1.0	
Water	100	1.0	
Waste	100	0.8	
Transport	100	0.9	

Final Design Impact - Qualitative

Section	Point score	Qualitative Impact (from 0 to 100%) (Ql)	Normalizing multiplier (M)	Final impact score
Site Planning	0	100	1.0	I_q
Energy	0	100	0.8	
Water	0	100	0.9	
Waste	0	100	0.8	
Transport	0	100	0.9	
Social	0	100	0.9	

Overall Appraisal

$$I_t = \frac{I_{n\,(\text{design case})} + I_{q\,(\text{design case})}}{I_{n\,(\text{base case})} + I_{q\,(\text{base case})}} \times 100$$

Overall Impact - I_t	Rating
75 % - 66 %	1 star
65 % - 56 %	2 star
55 % - 46 %	3 star
45 % - 36 %	4 star
35 % or lower	5 star

Thank You

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