

An IGH presentation

WHY GREEN WORRIES FOR BUILDINGS?



initiative for green habitats

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segments

The context within which we all are operating

The future staring at us (growth, pressure on resources, etc) and the choices we need to make

The Green Building focus of today and what it misses (embodied energy, strain on virgin resources, equity)

Sustainable building and its focus.





the context within which we are operating

CO2 levels are around **392 ppm** (2011 figures) compared to the **280 ppm** over a 150 years ago. Most of this increase is due to human activity.

We are over **7 billion** strong globally! Over twice the number less than 60 years ago. We are consuming much, much more than ever before.

Nearly **90** urban centres in India with a population of over half a million, nearly **50** 1 million plus cities and seven 5 million plus cities in India.

Construction activity is already adding a **severe stress on our natural resources**- Sand, Lime, Stone, Wood, Coal, pollution, water,... the list is long.

On a nationwide scale India faces a **38% deficit** in its water need and is seeing a **fall in groundwater levels of over 70%.**

Bangalore city stats show a **current shortfall of 255 MLD**, The projected shortage in Bangalore is about **655 MLD by 2015.**

In 2008-09 the power requirement was 774.3 Billion units, while the availability was only 689 billion units... a **shortfall of about 90 billion units**

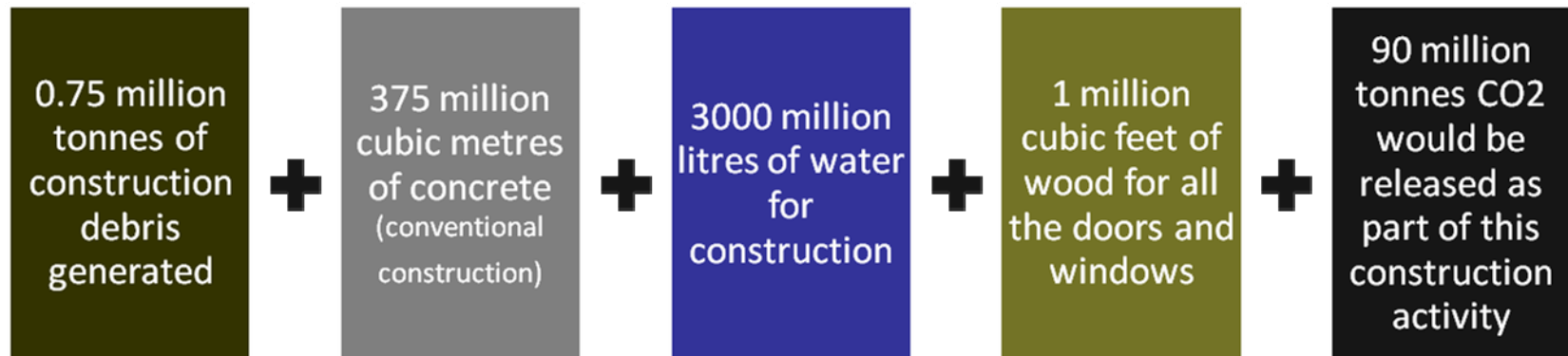
There is a **growing divide between the rich and the poor....** More and more building solutions are industrial products and less human skill based. Fill it-shut it solutions are the order of the day.





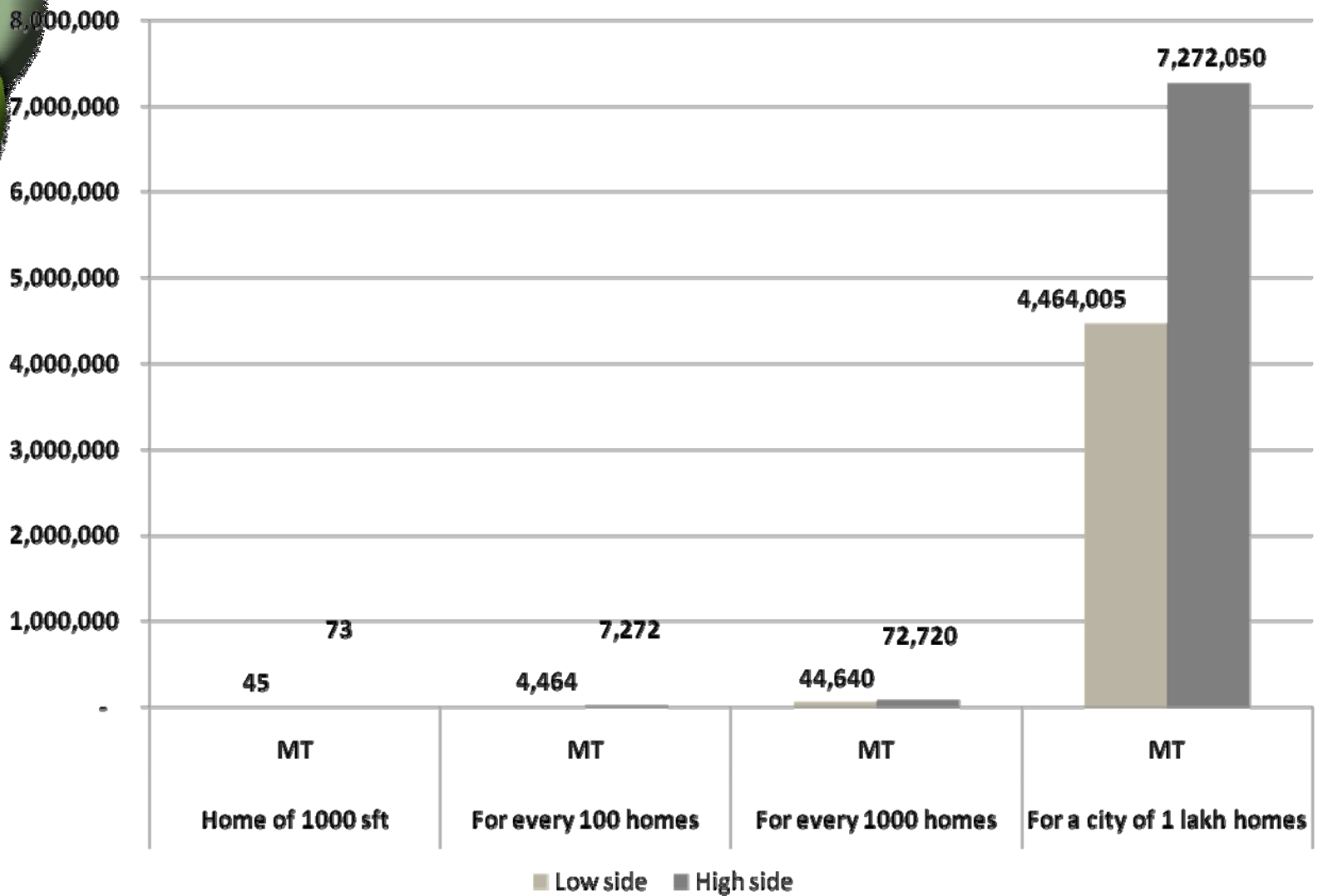
an overview of the housing sector- for a city like B'lore

Let us consider a city that has about 1 million odd formal homes. Consider just about 75 sq metres per home (a very moderate figure). This amounts to about 75 million sq metres of built area. To build all these homes it would take:



how the built breathes out CO2

Emissions from Cement, Steel and Brick





the future staring at us

India is currently 28% urban is expected to grow to 35% urban by 2020 and **50% urban by 2030.**

Even at today's 1.2 billion odd, that would be about **240 million** people.

Current demand of about **25 million** households, and this is expected to grow to meet the urbanisation need of about **60 million homes** in the next 20 odd years.

There is an urban renewal expected, with more than a **doubling of existing building stock** in this period...considering the shelf life of RCC buildings and market forces.

By 2031-32, the power generation capacity must increase to nearly **800 GW** from the current 151 GW

An additional **36,000 million litres a day** of water would be needed to feed this new urban population

Just the new houses would mean:

- **45 million tonnes** of const. debris
- **180,000 million** ltrs of water for construction
- **5,400 million tonnes** of CO₂ released

Over **3 billion** construction skillsets could be involved in the construction process





the Green Building focus of today

The main categories of focus of green building today are:

- **Site-** Towards minimal change in natural site topography and preservation of top-soil.
- **Materials-** Reuse and recyclability. Locally available materials are encouraged, but that only applies to the last mile (from supplier to site). It does not include the overall distance of travel from location of raw materials-to factory-to dealer-to site.
- **Energy-** Focussing only on the operational end
- **Water-** Aiming to bring small improvements through what are considered efficient fixtures, and rainwater recharge
- **Waste-** Reducing the waste generated in construction of the building
- **Biomass-** Promotes the use of indigenous, non-water intensive species.
- **Transportation-** Feeble stress on reducing dependence on cars.

Popular green certification encourages industry based solutions



... and other needed focus

Here are a few other areas that need attention.

- **People-** Equity of participation- the small scale crafts persons and therefore traditional knowledge is being grossly neglected; lifestyles (after all that is also what one is trying to address) need to be addressed to make the built environment solutions worthwhile.
- **Energy-** Embodied energy, a significant factor is completely given a miss. This includes building materials, and systems. There is no encouragement to reduce high embodied energy building systems. Much more stress on renewable energy systems are needed
- **Biomass-** There is no in-depth register that is relied on local Indigenous species for the various regions of the country. Also, biomass is not linked back into number and type of trees planted.
- **Biodiversity-** There is no specific agenda on how the built environment can also aid biodiversity.
- **Food-** No stress on urban agriculture, or other forms of addressing food needs.
- **Consumption-** Encouragement to reduce the overall consumption of resources (both in built and operations has to be laid).

Monitoring remains a area of concern.

We need to critically bring perspective to the green building agenda by first addressing 'what needs to be done' to mitigate the stresses on the environment.

This may need some bold decisions that are aided by government strictures and incentives.





an illustration of Sustainable Building- at Bellary



Business As Usual scenario:

- Concrete blocks or burnt bricks transported from large distances to the site
- Use of virgin woods; most originate in other countries and therefore high energy timber
- RCC slabs
- Vitrified tiles
- All surfaces cement plastered and painted



Sustainable Built Env. scenario:

- Custom made blocks manufactured at site- GGBS.
- Use of reclaimed timber for all joinery works
- Precast intermediate flooring and roofing systems
- Pigmented cement flooring directly laid on the slab
- Pointing on block masonry as wall finish





an illustration of Sustainable Building- at Goa



Business As Usual scenario:

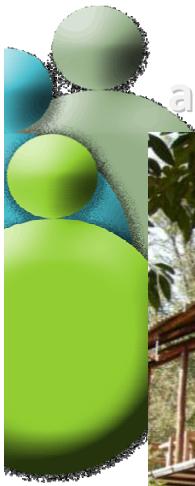
- Over mined Laterite block Masonry walls with plaster and paint



Sustainable Built Env. Scenario:

- Custom made blocks using iron ore waste.





an illustration of Sustainable Building- at Coorg



Business As Usual scenario:

- RCC framed structure
- Masonry walls with plaster and paint
- RCC slab
- Vitrified tiles

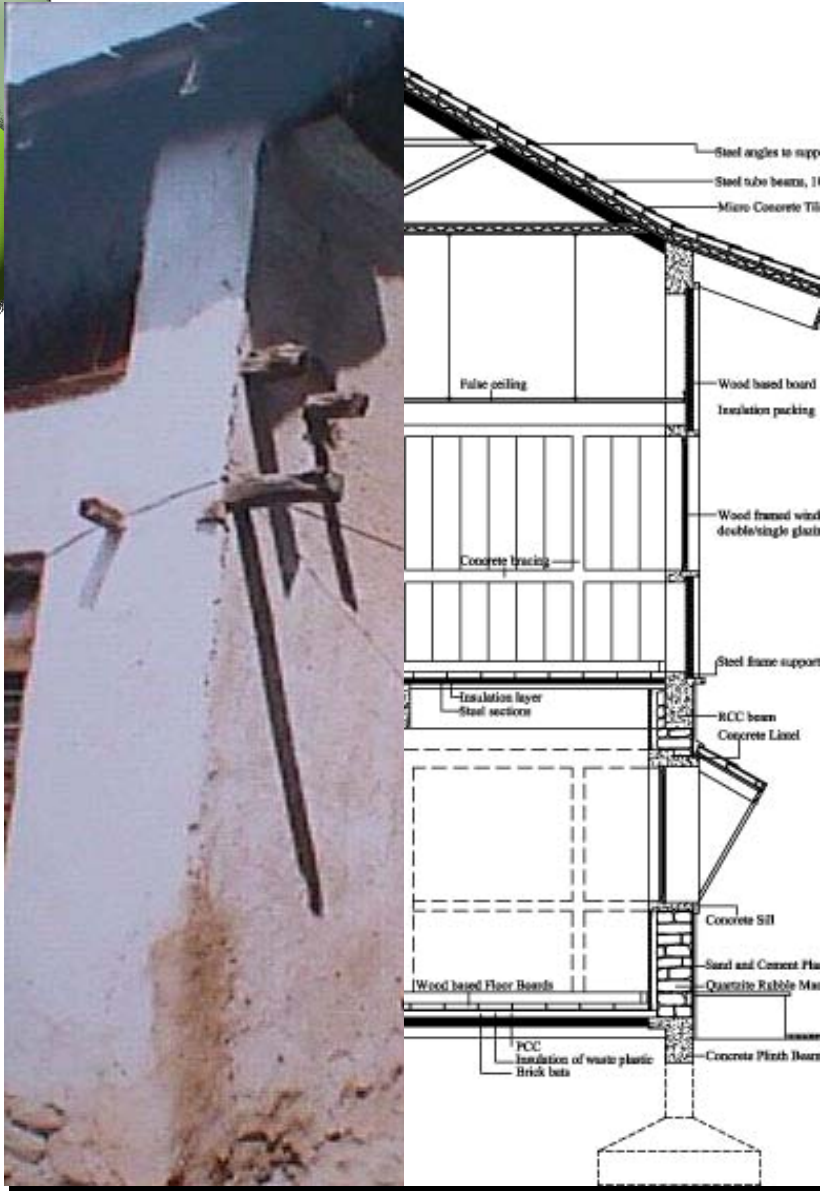


Sustainable Built Env. Scenario:

- Light weight, modular bamboo and steel hybrid structure
- Bamboo mat board panels set in plantation timber frames with minimal (laterite) masonry
- BMCS supported on bamboo purlins
- Palm wood flooring



an illustration of Sustainable Building- at Bharmaur, HP



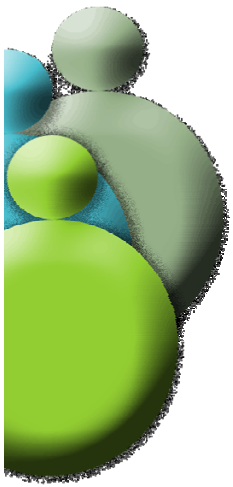
Business As Usual scenario:

- RCC framed structure
- Burnt brick masonry walls
- RCC slab
- Metal trusses with tin sheet

Sustainable Built Env. Scenario:

- Composite RCC columns and footings with welded lattice metal rafters for roofing and intermediate flooring supports
- Custom made blocks made from land slide waste for the lower floor
- Upper floor walls in light weight composite wood boards with plastic mat insulation
- MS purlins over MS lattice girders made by local blacksmiths
- Micro concrete tile (DA technology) with plastic insulation on the under side





THANK YOU



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