

Paths to Sustainability

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The move to sustainability in terms of materials would require a bigger change

Something can be called sustainability only if it is acceptable for everyone to have it.



Fig 1



Fig 2

The day when the world will deal with per capita resource consumption (food, water, fuel, land, waste ...) may not be far.

The green building movement has come a long way in India and it has now become fashionable for governments, corporations and even developers to get green certification for their buildings. While many of these buildings are more efficient than poorly designed new or old buildings, some are actually more resource intensive than what they replace. This is typical of an economy in transition where consumption levels are changing. In many cases people move from non-air-conditioned buildings to air-conditioned ones and also into larger places.

Fig.1 and 2 show two residential buildings that will be two of the highest rated green residential buildings in Mumbai. These buildings use the

state of the art technology to achieve a high green rating. They are both located near bus stops so residents can use public transport. To reduce heat island effect they have put all the car parking under shade and have green roofs. In fact they both produce more green area than the site they are built upon. They make good use of natural lighting and ventilation and they have spectacular views from all areas. They use water efficiently and recycle and reuse it on site. The building envelope is carefully designed to meet the requirements for insulation and they use very efficient air conditioning systems. Finally they produce some of the energy they use, through renewable means and even have the possibility of growing some food on site. The

first one is a single family home while the other is supposed to be multi-family residential building with all the luxury that is possible.

As we define them today, green buildings are about using resources more efficiently, but actually, they should be about doing more with less. These two buildings can be considered as efficient only when compared to some hypothetical, poorly designed and constructed building on a unit floor area basis, but obviously neither of them is going to fewer resources to achieve more. While people have a right to live the way they wish to, the rating system that declares these buildings to be efficient users of resources is questionable. If these buildings are efficient then perhaps all buildings in Mumbai should be built like these.

There is an increasing tendency to call green buildings 'sustainable' buildings. When people use these terms loosely, it does not matter, but when it is done in knowledgeable groups, it needs a discussion and resolution. The jump from green buildings to sustainability implies that sustainability also results from greater efficiency of resource use that is the hall mark of green buildings. That may be far from the truth. Consider cars for instance. Are fuel efficient cars greener cars? Would the city of Delhi have a sustainable system of transport if everyone drove a fuel efficient green car? Obviously it is not the fuel efficiency of individual cars but the fact that everyone would drive a car that determines if the transport system would be sustainable. Something can be called sustainable only if it is acceptable for everyone to have it.

To get to higher levels of efficiency and to score points in a rating system, green buildings use more efficient technology. However, sustainable development cannot come only from technical fixes that improve efficiency. Any development needs to be environmentally and socially sustainable. The development needs to be able to deal with the requirements of all sections of society. In the absence of social equity, there will be no stability and no sustainability. This is obvious in the way the poor countries look at the rich countries as also in the way the poor people in a country look at the rich in their own country. The poor want a more equitable system in which all human beings are equal with equal

access to natural resources, while the rich believe they have a right to use whatever resources that they can pay for. The day when the world will have to deal with per capita resource consumption (food, water, fuel, land, waste) may not be far. The Common Carbon Metric developed by the UN Sustainable Buildings Climate Initiative (UN SBCI) measures energy use and carbon emissions use per sqm of built space and per person as well. When resource use is measured per person, the relationship between lifestyle and sustainability becomes clear.

To move on to sustainability, the green building rating systems need to deal with social equity and not just with efficiency of resource utilisation. Only the level of resource use that all of us can have, may be called efficient, acceptable and sustainable. Without this measure, we may continue to have green buildings but no sustainability. One can ask if it is possible to define this acceptable level of consumption?

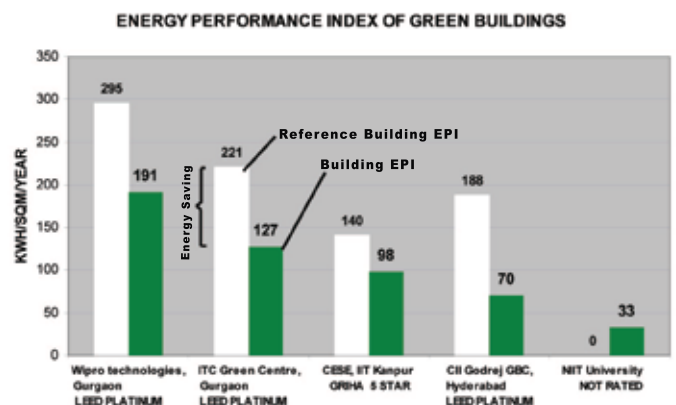
Green building ratings in India have come to us from USA. As used in India, the ratings are a reaction to glass and aluminium office buildings that blot our cities and the efficiency of new buildings is defined with respect to these inefficient buildings.





To define the new standard for sustainable buildings or built environment, we need to look at some truly sustainable buildings that we have within India without applying western notions of air conditioned comfort. Laurie Baker's work in Kerala would qualify well as a reference benchmark. Even in a warm humid climate, his buildings function without air conditioning and the last building he designed for an Institute in Vilappilsala was designed to function without water or power connection. The idea is not to deny comfort or air conditioning to those who must have it, but to let them know where they stand as far as social equity and sustainability are concerned. The result of changing the benchmark can be quite dramatic. Fig. 1 shows the comparison between Energy Performance Index of 4 well known green buildings and one recently completed but unrated building with similar facilities. Each green building has claimed a substantial reduction (30-60%) in energy use as compared to a reference building. However the consumption varies by

a factor of six. Each of the four rated green buildings consumes a lot more energy than the unrated building which by no means is the last word in energy efficiency. The problem lies in the benchmark that the green buildings are compared with. The unrated building (NIIT University by the author) was designed without a benchmark and its performance was compared only with other well designed buildings. It is not a building that saves energy but one that uses energy very carefully.





Green buildings are not just about efficiency of energy consumption. Buildings consume a great deal of material resources of the world. The move to sustainability in terms of materials would require a bigger change than the 5% of recycled or recyclable material content used for green buildings. India is a place with a thriving recycling industry and just about everything is reused and recycled. This applies to wood, paper and plastic used as packing material; to building components like bricks, doors and windows, steel reinforcement and plumbing pipes; and definitely to steel and wood that comes out of ships. These materials are not thrown away but sold profitably for reuse. Their use in green buildings does not imply any greater efficiency in material usage by the society as a whole. Similarly, old steel is commonly used in steel furnaces and there is no benefit to society by using steel with recycled content in green buildings. The use of locally available materials in green buildings is consistent with sustainability. However use of local materials from distant foreign sources commonly used in green buildings – FSC certified wood for instance – cannot be considered sustainable. Sustainable buildings will need to make much greater use of bamboo

and other natural fibres and do away with composite materials that cannot be recycled.

To become sustainable, green buildings must be part of a sustainable matrix. By their very definition, green buildings are not expected to control the larger context that is crucial for sustainable development. Consider the case of a certified green farmhouse outside municipal limits that many people wish to own. Any savings from the green features of the building are offset by the energy spent in travelling to and from the farmhouse. Even worse is the case of green office buildings where the users commute daily by car. Sustainable development would be possible only if people could walk or bicycle to work- something that is possible only in high density urban situations.

If the per person index of resource use is applied to buildings, one would get a completely different picture of performance, and the residential building shown above would never have a chance of being called green. We will then be able to move to a more socially equitable standard for green buildings and perhaps a better definition of sustainability. ■