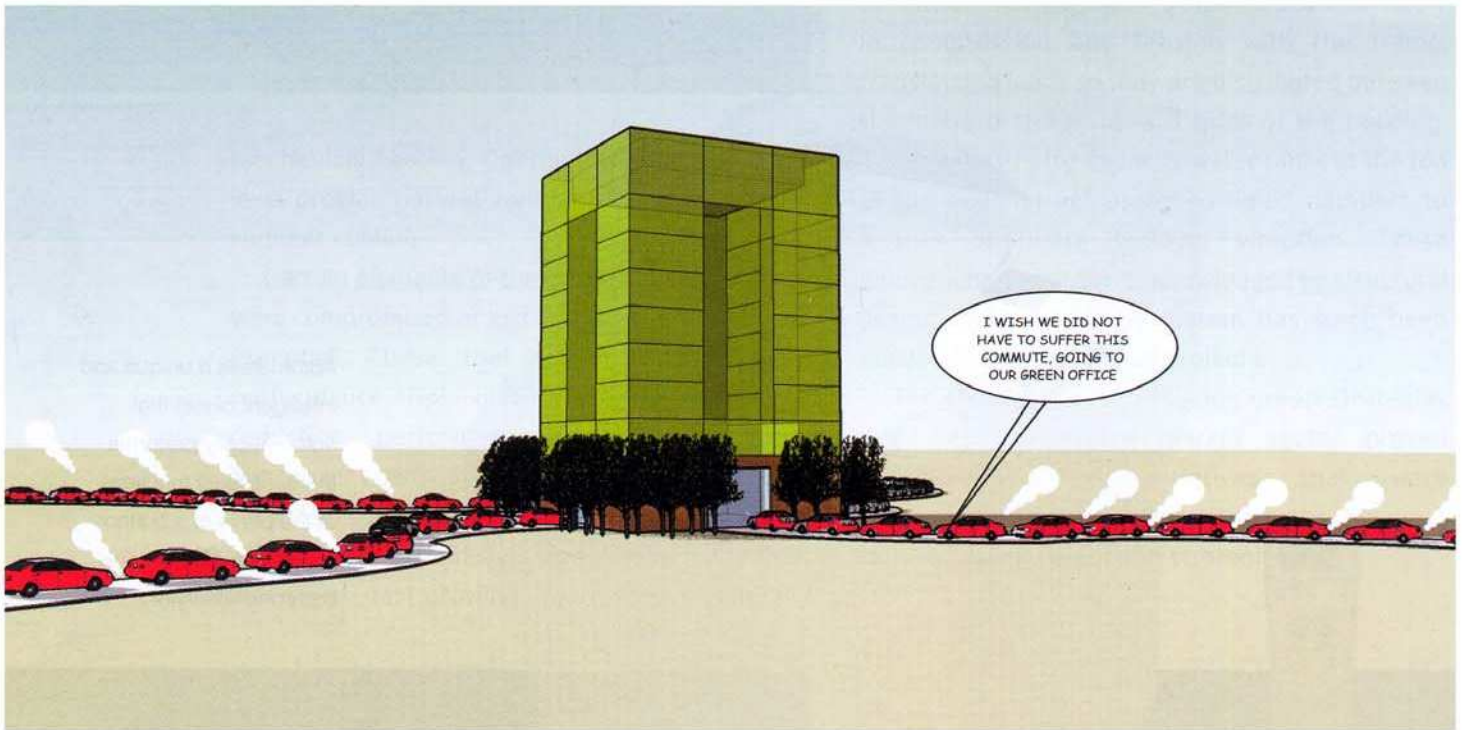


Sustainable Design – Do Buildings Matter?

Vinod Gupta



“ The earth provides enough for every man’s needs but not for every man’s greed. ”

– M K Gandhi

green buildings seem to have become synonymous with sustainable design although there is evidence available to suggest that green buildings are no more sustainable than other buildings. The case for making green buildings rests on the fact that the buildings are responsible for about 40% of global energy consumption. It is a huge number for one single sector and obviously this is where a big difference can be made. But 40% is only a small part of 100% where much greater savings in energy consumption should be possible.

A typical office worker in a large city in India spends about an hour each way for commuting to work and another hour for outdoor recreational activities everyday. The rest of the

time is spent in a building. Thus, out of 24 hours in a day, an office worker spends about 21 hours in buildings, that is, 87.5% of his time. School going children also spend about the same amount of time in and out of buildings. Housewives and non working or studying population spends about 23 hours in buildings. Buildings that account for 87.5% of our time are associated with only 40 % of our energy consumption while other non building activities account for 12.5% of the time but 60% of energy consumption. Can one say, therefore, that buildings are more energy-efficient than other places where human beings spend time? If this is true, a logical way of dealing with the energy crisis would be to make people spend more time indoors.

Last month, I spent two days in travelling to Bangalore, attending a workshop on sustainable architecture and returning to Delhi. The workshop was held in the Resource Learning Centre of Visthar (www.visthar.org) on the outskirts of Bangalore. It is a resource conserving campus with bamboo and thatch roofs, natural cooling and day lighting, greener than most LEED platinum rated green buildings. On each of these two days, I spent four hours outside the buildings and 20 hours in them. This is not very different from the earlier estimate of three hours per day outside the buildings. But the one extra hour per day actually included a huge addition to the daily energy expense - air travel from Delhi to Bangalore. Some time was spent at the airports in Delhi and Bangalore and a lot more inside Visthar's eco-friendly conference facility. A person focused on energy spent in buildings, would worry about the energy that a 24x7 facility like the airport uses and applaud the saving that the eco-friendly conference facility effects, but nowhere would he see that my share of energy expense in airports and the conference facility was insignificant compared to the energy I spent in travel to Bangalore. The energy expenditure in buildings was incidental to my decision to go to Bangalore.

The point is that the focus on energy consumption in buildings is a red herring. It is not buildings per se that consume energy, it is human activity. Energy consumed within the buildings and the energy used for making buildings in the first place, is part of the energy used for different types of human activity. Buildings are not independent energy users. The part of activity that takes place within the buildings uses energy and often the outdoor part of the same activity consumes far more energy. The major energy

expense on my visit to Bangalore - the taxi and plane rides - happened outside the buildings. The way to reduce energy expense (and resource consumption) in human habitat is not by focusing on buildings but on human activity. What do we do to reduce human activities that consume resources?

What would such a change of focus mean? If it is recognised that only 40% of energy is consumed within the buildings and 60% happens outside, then we can plan to reduce energy consumption by looking at the entire activity, part of which requires buildings. For instance, to reduce the energy used by an office worker, one could change the mode of transport to a more efficient one - public transportation or car pooling; remove the need for mechanical transportation by appropriate planning and location of working and living areas; reduce the need for transportation by working from home; and improve the efficiency of energy use in the home and office building.

The last one is important when the other three have been carried out. Only small improvements in efficiency would result from the building alone. It is well-known that badly designed buildings lend themselves to changes in design and specifications to improve their efficiency of resource utilisation. The same is difficult and expensive to achieve in properly designed air-conditioned buildings or in non-air-conditioned buildings. From a systemic point of view, once the cheap fixes are made in building design, the law of diminishing returns comes into play and it becomes difficult to improve building efficiency without looking at processes outside the building. The opportunity for improving the overall efficiency of the system (building and non-building) is available even if building efficiency has been improved.

Another way of looking at the problem is that buildings are part of a larger system and in order to function properly, buildings are dependent on the system for bringing goods, services and people to buildings. Supply of energy, water, and food and other goods, transportation for people, disposal of wastes, etc, are all needed for buildings to function properly. Obviously, these services require energy and material expense. Making an efficient building in wilderness where the occupants will need to travel long distances by personal motorised transport does not make sense when the efficiency of the overall system is examined. But this has never stopped such buildings from getting green ratings or a certificate of building efficiency.



If we focus on human activities as the ultimate consumer of energy and resources, we need to examine how the nature of activities may be changed in order to reduce consumption of resources. We shall then be able to focus on energy intensity and efficiency of different human activities. If personal transport is considered inefficient, we shall need to encourage the creation of a habitat that obviates the need for personal transport. If a particular technology such as air conditioning is considered to be wasteful of resources, then we shall have to find ways of doing without it. Simply using a slightly less fuel consuming vehicle or air-conditioner will not produce acceptable levels of system efficiency.

Because the Indian economy is expanding at a fast rate, it is sometimes thought that technology will provide solutions that will enable us to live with a lifestyle and levels of consumption that we see in Western countries today. Any discussion on changes to lifestyle is considered inconvenient and unnecessary. The great Indian environmentalist M K Gandhi was against a lifestyle with high levels of consumption. One of his famous quotes is "the earth provides enough for everyman's needs but not for everyman's greed". On bringing the British standard of living to India, he said, "It took Britain half the resources of the planet to achieve its

prosperity. How many planets will a country like India require?"

The easiest way of cutting down on resource consumption is to build less but this is one option that architects, builders and owners are unwilling to discuss. Building more (than needed) is common and part of the current lifestyle. It takes a lot of effort to improve fuel efficiency in cars or airplanes by 10% but it is relatively easy to cut down travel by 20%. This is a matter of choice and lifestyle. In buildings too it is difficult to reduce consumption by 10% but it is possible for each one of us to build 10% less. That one act of building less will mean lesser consumption of resources across the board.

A sustainable lifestyle has to deal with the overall context and not just with buildings. Given the large stock of existing buildings, it is clear that to move to a sustainable future for the built environment, the emphasis will need to change from new buildings to existing buildings. Before a new building is built, people need to ask: Is this new construction necessary? (people used to ask this but today the question asked is "can I afford it?") Can an existing building be upgraded to meet this requirement? Would it save resources if this building were built elsewhere?



One needs to build less, build only as much as is necessary and build things for a long life span and not for a throw away economy. How does one do this in a rapidly growing economy? Just because we have the money to do anything, it does not mean we must do it. We already have a voluntary system of checks where the individual user clearly understands the penalty. People do not keep eating just because they can afford to do it. People eat only so much as they need to and those who do not, suffer very quickly. Where you eat and what you eat decides how much you pay for it. The difference is in quality and not so much in quantity. It is clear that people understand the relationship between their body weight and eating. They understand the consequence of their actions and in terms of resource consumption also we need to move to a situation where we understand that there is only so much that we can use up. We need to be able to relate environmental degradation to our individual activities.

In the Western countries, it is easy for people to see that a measure of equity is necessary in distribution of commonly owned critical resources. However, the Western countries cannot see that equitable distribution is important between the countries. Because we have lived with inequality for so long in India, we also cannot see that equitable distribution is necessary in our society. We believe that our ability to pay

determines what we might consume. At the international level, between countries 'might is right'. Within India too, might is right holds true.

The tools we use to define efficiency are important. The green building movement typically measures resource efficiency per unit of built area. How many units of area the individual requires is never an issue in green buildings. Even the Energy-Efficient Building Code benchmarks energy consumption levels per square meter of built space. A more equitable system would perhaps benchmark consumption per person similar to some urban level planning benchmarks even today.

Finally, we have to understand that buildings are not responsible for resource consumption, people are. Unless we are able to define what sustainable resource consumption is, there is little that we shall achieve simply by making buildings more efficient. We shall continue to nurture inequality that will render the society unsustainable. Green buildings, in the absence of a better understanding of the larger picture, will result in nothing more than green wash. ✚

Illustrations: Vinod Gupta

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