



Energy Security Dialogue

Green building design: potential for sustainable energy consumption

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The construction sector in India which currently contributes to 10% of India's GDP, is growing at an unprecedented rate of 9.2% as against the world average of 5.5%. Unfortunately, construction activities in India have been pursued without paying much attention to environmental issues. Domestic and commercial buildings account for more than 30% of the country's annual electricity consumption.

TERI's experience shows that over 20% energy saving is possible in existing buildings by retrofitting with efficient lighting, air-conditioning and electrical systems. New buildings can save up to 50% energy by appropriate design interventions in building envelope, lighting and air-conditioning systems. Additional investments needed to implement energy saving features and systems are easily offset by huge operational saving potential over the building lifecycle.

In this context, the workshop sought to examine the importance of alternative and complementary approaches and elements of green building design, and their potential to promote sustainable energy consumption by reducing energy consumption as well as by promoting greener energy. The workshop discussion addressed the following questions:

- What are the ways to enhance energy efficiency in existing buildings? Can these approaches complement each other?
- How can new buildings be designed to be more energy efficient and less resource (and energy) intensive?
- Specifically for Goa and other tourist locations, what principles should guide the establishment of energy-efficient hotels?

Sustainable building looks into all aspects of construction and design including site planning (conservation and protection of existing landscape and site features, control of erosion and sedimentation, air pollution prevention, safety of construction workers, water efficient landscaping techniques, energy efficient lighting and use of renewable energy based lighting systems for outdoor lighting); building envelope design (climate responsive design to reduce space conditioning and lighting loads, use of appropriate levels of insulation and glazing systems); building system design (energy efficient heating, ventilation and air conditioning, lighting, electrical and water heating);

integration of renewable energy sources to generate energy onsite; and water and waste management (water saving fixtures and faucets, rain water harvesting, waste water treatment, recycle and re-use of treated water). It is recognised that there are economic, policy, legal and institutional barriers to adoption of the principles of sustainable energy consumption (efficiency in energy consumption and promotion of use of renewable energy forms) in new buildings and in existing buildings and an understanding of these barriers is critical.

Key takeaways

- The discussions at the workshop identified knowledge gaps that point to lack of information about green building design in the government, and amongst the players in the construction sector and larger civil society. Industry representatives mentioned that while there is an economic argument for ‘going green,’ the information available is not sufficient. It was suggested that this could be addressed by operationalisation of demonstration projects. Energy-efficiency related government schemes that are applicable to the tourism industry should be better publicised so as to increase the participation of the tourism sector in the sustainable building movement.
- For people at large to pursue green building design and adopt green technologies, efficient after-sales-service and support services are required. This involves large-scale technical capacity-building.
- To promote the use of renewable energy in buildings, it is important that the deployment of renewable energy technologies is incentivised by making the economic costs comparable to conventional energy. Government representatives identified various schemes that were available for people to take advantage of. For instance, subsidies are available for installation of solar-water heaters of up to 200-litre capacity, and installation of 10kW solar-wind hybrid power generators.
- Development should not be linear, additive or quantitative, but should be organic such that it adds to quality of life. Aspects of green building design should be mainstreamed into macro-level planning and relevant policy and regulatory frameworks.

Some areas of intervention identified for further engagement include:

- Development of manuals or packages of information and provision of extension services to hoteliers, government departments, gram sabhas, consumer societies etc.
- A travelling exhibition of green/sustainable buildings and their elements
- Organisation of tours for architects and members of the construction industry to see successful examples of green buildings and townships
- Widespread dissemination of information to further proactive participation of community groups and organisations
- Reaching out to consumers, particular the youth
- Creation of a network of green practitioners/architects/builders where information and good practices are shared

- Green certification for various products to help consumers make green choices
- Creation of demand for green products through policy support.