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Green roofs- an eco-friendly approach to sustainable livelihood

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ABSTRACT

Urbanization has rapidly been consuming the green cover of the precious earth planet, thus resulting into severe global problem in urbanized areas. The green concept for roofs and the city represents a truly rare occurrence in modern economics: a tool for the remedies for urban climate change, building cooling, energy savings, noise and toxic gas reductions, storm water management, biodiversity conservation and the creation of new markets for existing goods and services. Green roofs have become a very important component of sustainable urban development in modern age. Their striking economical and ecological advances, along with growing environmental awareness, are the driving forces for this great success. At present, green roofs and rooftop gardens can be found in most big cities around the world, benefiting the urban environment and its inhabitants. Green roofs have yet to catch on in a big way in India, but hopefully this will change soon.

Many building design professionals around the world have hugely underestimated the value of green roofs. Especially in warmer countries like India, a well-irrigated green roof can provide greater energy savings compared to a cool roof or even an insulated roof. "Green Roofs for Healthy Cities", have wide benefits. Studies have shown that green building space commands a premium of at least 6% in some countries.

Green roofs are comprised of a number of different layers, all of which have different and related functions that have to work together to function properly.

KEYWORDS

Green Roof;
Urbanization;
Tool;
Remedies.

INTRODUCTION

Commonly green building is "A green building is one which uses less water, optimizes energy efficiency, conserves natural resources, generates less waste and provides healthier spaces for occupants, as compared to a conventional building." Source: IGBC

The factors to be considered while constructing Green Building are:

1. Water efficiency - capture, reduce, reuse
2. Energy efficiency and Renewable energy (always energy efficiency first)
3. Site sustainability
4. Indoor Environment - health, comfort and well being
5. Material sustainability - reduce, reuse, recycle
6. Waste management
7. Durability

8. Measurement, verification and action
9. Make it easy for occupants to be green
10. Show off (Spread the word)

There are three main reasons to install a green roof:

1) Aesthetics
2) Usable Amenity Space
3) Heat Mitigation

All other benefits are important but not the key drivers in the decision making process. But more importantly, the regular watering requires actually cools the roof slab below and provides radiant cooling to the occupants below. The evaporative cooling of the surroundings and the heat island mitigation is also far higher through a high moisture green roof.

As far as irrigation is concerned there is always scope for automation. Water can be obtained by simply treating the grey water in the building. The Green roof does not need high quality water and semi treated grey water is perfect to water a green roof.

The value of using drought tolerant species on a roof is over rated, at least in cooling dominated climates like India. Concepts like Xeriscaping are better suited and are the more sustainable method for ground landscaping.

Green marketing is one of the four pillars of building green, other three being design, implementation and verification & action. All these four pillars are interdependent and a green building project can add value only if all the four pillars are equally strong.

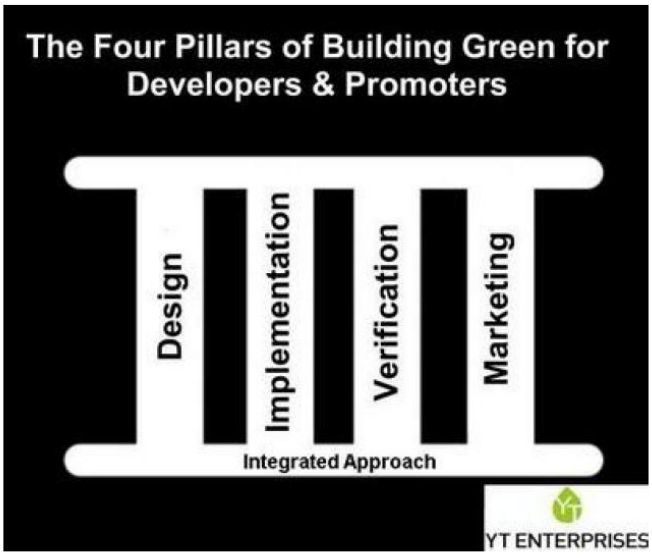

Figure 1 : The four tier schematic diagram of green roof

Studies have shown that green building space commands a premium of at least 6% in some countries.

The long and hot summer is now up and is the time we crank up our air conditioners and this is also the time when we face highest power shortages. A large part of this heat comes from the sun's energy falling on the roof. The heat energy gets stored in the roof slab, walls and other high thermal mass items within the building. This energy is then transmitted indoors throughout the day and in the evening making us feel uncomfortable at the same time increasing the load on the air conditioning systems.

One of the quickest and the most economical way to mitigate this additional heat from entering our building is to install a cool roof (roof with high reflectivity and emissivity). Utilization of specialised ceramic paint coatings with Solar Reflective Index of 84%, which essentially means that 84% of the heat falling on the roof surface in reflected or emitted back to the sky. Provision for seamless finish to the roof by repairing gaps, cracks and any moisture problems. The expandable nature of the coating provides a dual benefit of heat reduction along with waterproofing that too with an 8 year guarantee.

The cool roof reduces the indoor temperature by up to 5 degrees thereby providing a payback of less than two years through energy saved on cooling. When factoring the cost of waterproofing and roof repair the payback is less than one year. In a factory setting the cool roof can help improve worker productivity and equipment life

Green roofs have become a very important component of sustainable urban development within the last 30 years. Their striking economical and ecological advances, along with growing environmental awareness, are the driving forces for this great success. At present, green roofs and rooftop gardens can be found in most big cities around the world, benefiting the urban environment and its inhabitants. Green roofs have yet to catch on in a big way in India, but hopefully this will change soon.

Figure 2 : Diagrammatic representation of green roof methodology.

WHY ARE GREEN BUILDINGS RELEVANT IN INDIA

There is no debating that the human race is growing faster than the planet earth can sustain. This unsustainable growth is clearly causing certain environmental changes that need to be reversed. Now, there are many different things we can do to correct our ways and minimize environmental degradation. However, green buildings seem to be the lowest hanging fruit in this quest to achieve reasonably sustainable growth. Buildings are responsible for a large portion of our emissions, especially in a country like India where the sector contributes significantly to GDP, is a huge employment generator, energy consumer, water consumer, wastewater and waste generator. Yet green buildings are easy to design and build. Additionally, green buildings do not cost much more to build than non-green buildings, and they are not prone to political disagreement, unlike other clean development measures. These factors make building green a very attractive option for governments to pursue.

India is a large country with a large population and huge developmental challenges. It is practically impossible for even the most efficient government machinery to supply water and electricity for 1.3 billion people. India is a water-deficient country and the energy crisis seems to be perennial in nature. Moreover the unsustainable energy and water policies are not helping the cause. Hence, it's only common sense to insulate oneself from the resource crunch and strive toward self-sufficiency and smarter living. This realization has contributed immensely to the growth and promotion of green building. Apart from that, green buildings offer the an opportunity to avoid lack of differentiation. Green building has become the "something new" that has not been done before.

THE FUTURE OF GREEN BUILDING IN INDIA

Green buildings and the concept of smarter living offers tremendous opportunity for overhauling an average Indian's lifestyle. As the general public becomes more aware of the benefits of green buildings, developers will get creative and find new ways to brand, market and sell green buildings, hence creating a conducive atmosphere for the sector to grow exponentially. One only hopes this frantic activity remains clean and green the way it was envisioned to be.

CONCLUSION

Green roofs are attractive, ecologically beneficial and offer several practical advantages to a business or home. The advantages are numerous. Such as Prolongs the life of a roof via UV deterioration elimination thus extending the life of the roofing. Reduces storm water run off. Increases oxygen, Reduces air pollution, Reduces NOISE pollution, Beautifies,

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