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Solar Energy: Aid for Sustainability in Building Design

Sharmin Khan
Department of Architecture, ZHCET, AMU, Aligarh, India
E-mail: sharmin_amu@rediffmail.com

The increase in urban population, during last couple of years and the pace of development in science and technology have moved parallel. These two activities have given birth to environmental degradation, and are closely knit together. According to UN, the proportion of world's population living in urban areas shall be greater than the population of those living in rural areas. It is expected that almost all of the increase in the world's population during 2000-30 will occur in urban areas and about half of this will be absorbed by the urban areas of less developed regions. A study at The Energy and Resources Institute, New Delhi, analysed that unless the emissions are reduced by at least 60% by 2050, the earth's climate could move to an irreversible phase of global warming. This is a major challenge for designers and planners. There is an emergent need of acting and introducing the issues of sustainable development in the by-laws and regulations.

The population has been moving to urban areas and human beings have started struggling to survive on the planet Earth. The result is exploitation of natural resources, beyond its capacity to bear. Time has come, when the society has to be cautious of the fact, that the non-renewable resources are depleting at a fast rate and there is a need to rethink about the development in science and technology that is responsible for the disastrous situation.

Advances in the technology for renewable resources are an answer to the problem, in the present scenario. Renewable resources are those which can be naturally replaced and reutilized. These renewable resources have been enlisted as oxygen, sun, wind, water, timber, biomass etc. In other words, these resources are a gift of GOD to human beings. Science and technological developments have started to look forward towards these resources, as a hope for the future development. One such resource which is available in plenty is the solar energy. The Renewable Energy departments in Indian Ministry expressed its interest in such developments. It is said that, the government is working at revising the solar power generation target to 100,000 MW for 2022 from the current 20,000 MW. This ensures that the future of such energy usage is bright and there is a lot of scope for the development.

Solar energy can be utilized in two ways, depending upon the technique and methodology adopted. These are named as Active and Passive solar techniques. Active solar techniques are related to the usage of solar energy through some mechanical means, like cooking, in pumps, or in the form of photovoltaic systems and panels for solar energy for water heating, and solar power concentration as backup energy. The passive means of utilization of solar energy focus on the issues related to designing of structures, planning and placement of spaces. Some of the objectives of passive design can be listed as:

- Intelligent orientation of structure and placement of spaces according to

requirement of solar energy, in that area.
- Designing spaces and creating masses such that air circulation is maintained.
- Creating spaces in the structure for placement of Photovoltaic panels etc., so that the sun rays are not blocked and maximum energy can be generated.
- Choice of suitable building materials, depending upon the climate of place, so that the maximum utilization of thermal mass property is possible.

In spite of having innumerable potential, the solar energy available on earth is not fully utilized. It can be said that there are some barriers and obstacles in the path of its utilization. The designers, planners and Government bodies need to play an important role in promotion and utilization of this source of renewable energy, to save environment. Some of the ideas can be:

- The Architects and Planners need to create awareness among their Clients regarding the advantages of employing solar energy utilization techniques; both Active and Passive.
- The Client can also promote the solar techniques by making it mandatory for the planner.
- The discounts can be offered by sellers, on the prices, for promotion of such technologies.
- Government organizations may promote the adoption of such techniques by creating awareness through media, by providing subsidy to the Clients or tax saving benefits etc. The usage of such resources can also be implemented as necessary in the bye laws, depending upon the site area available.
- The financial institutions can provide easy loans, lower interest rates or lower EMI's for adoption of solar energy utilization techniques.

Although it seems difficult but is not impossible, to turn towards these resources for saving environmental degradation. It may cost higher initially, but the gains are innumerable, in the long run. It can only be hoped that planet Earth shall be saved, by inputs and efforts of community. All that is required is a concern and awareness, towards the present scenario of environmental degradation and the potentials and saving options by employing such renewable sources of energy. A lot has been done and still there is much potential for future development. Our little acts of concern today can make a world of difference tomorrow for our future generations.

