

# Passive Design Strategies in Energy Efficient Building

Akshada raverkar<sup>1</sup>, ar. Ridhima Madan Seth <sup>2</sup>, Purva puranik<sup>3</sup>

<sup>1</sup>Fourth year student, Architecture, SDPS women's college, Indore

<sup>2</sup>Asst. professor, Architecture, SDPS women's college Indore

<sup>3</sup>fourth year student, Architecture, SDPS women's college, Indore

\*\*\*

**Abstract** - This paper reviews about the benefits of passive design strategies in energy efficient building design.

Passive design takes the advantage of local climate for the construction of the building and it is really beneficial for site planning and analysis. In today's area one of the most important issue is of sustainable development in the society. The rapid growth of energy consumed in India is gradually increased within few years. Therefore saving energy will become a primary use now a days.

Passive design strategies reduces in cost, provide thermal comfort, provide healthy environment and saves fossil fuels.

## 1. INTRODUCTION

This is the major reason of exhaustion of energy resources on our planet. Which affects our environment badly such as depletion of ozone layer, global warming, and climatic change.

The energy efficient building is the one whose construction is a life time investment and it will assure that healthiest environment. This type of building is an outcome of design philosophy which increases the usage of resources like water, energy and materials which reduces the less carbon emission.

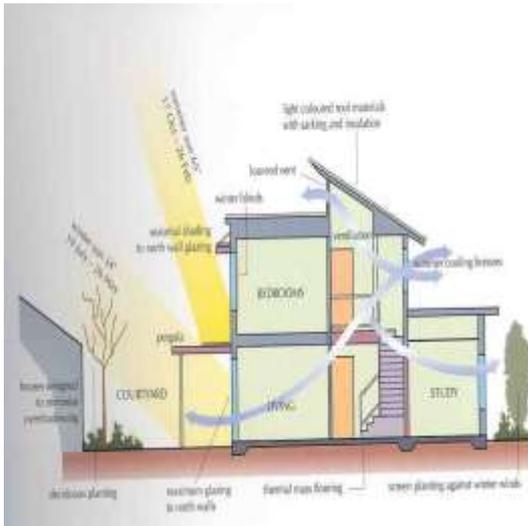
Conventional methods (active strategies) will harm our environment with their removal of toxic gases. Constructing a building without environmental safety measures can cause many harmful health affects and damage the quality of life in future.

So, the passive design strategies are the opportunity in building sector and construction that because the usage of natural resources and material efficiency and other passive techniques we can built a super energy efficient building.



## 1.1 Literature review

- This chapter gives an overview of research that describes user experiences with different types of energy-efficient buildings, focusing on indoor climate, technical operation, user attitudes and general satisfaction.
- The main aim of this chapter is to give guidelines for further research, based on existing user evaluations of energy-efficient buildings. Three important areas for further research on user evaluations could be identified.
- First, there is a shortage of research that takes into account the social context for evaluation; the social environment, the process of moving into an energy-efficient building and prior knowledge of environmental issues influence evaluation of the buildings.
- Energy-efficient buildings may also require specific architectural solutions and further research should consider architectural and aesthetic aspects in the evaluation.
- Research on the use and operation of energy-efficient buildings is increasing, but there is still a need to give more detailed attention to different ways of providing information and training in operation and use.



### 1.2 Climatic Considerations

Orientation of building of building is such that it will give maximum sun light in winter season and minimum in summer.

Shape of the building help for better passive strategies.

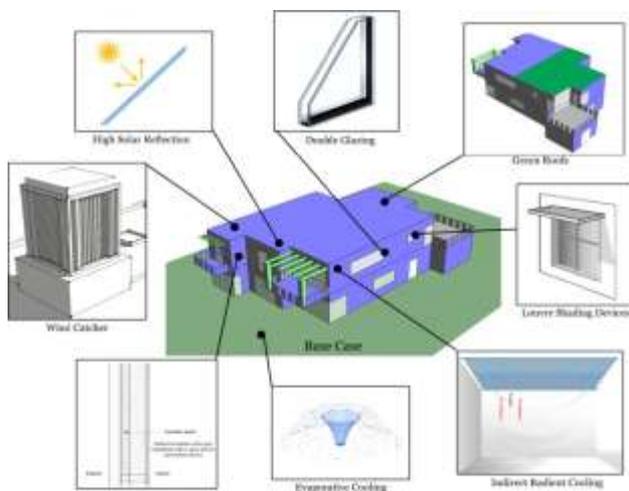
Openings in buildings are according to sun path which helps in the natural light ventilation of the building.

### 2. MATERIALS

Materials are depends on the climate of that region.

Properties of materials -color, insulation property, assembly type.

Building materials can be classified in two categories visible and invisible. Which includes internal and external finishes of the building.



### 3. OBJECTIVE

- Increasing demand for building services and comfort levels together with the rise in time
- It will assure that the energy demand will continue in future.. .
- To search out the planning strategies to a built energy efficient building.

To study different materials and construction techniques which we use during the construction of the building.

### 4. BENEFITS OF PASSIVE STRATEGIES IN ENERGY EFFICIENT BUILDINGS

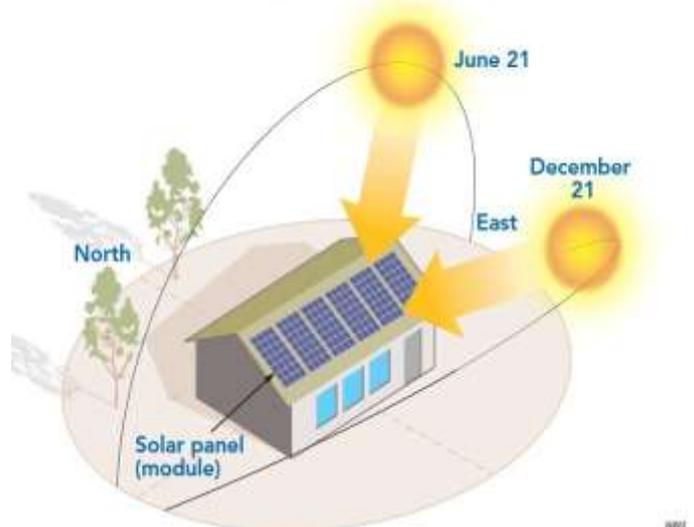
It minimize the energy efficiency in the building design.

It reduces the heavy bills of the building which is a long term investment.

It improves the IEQ (indoor environment quality) of the building.

It improves the construction quality and durability of the building.

### Sun's Path During Summer and Winter



### 5. CONCLUSION

As we study above data, it is conclude that passive design strategies are very useful in building sector because of this no toxic gases release in the environment. The key to designing a passive building is to take advantage of the micro climate.

Climate, characteristics and classification helps in identifying approaches as early as site planning and analysis. And if we want to save our environment from degrading we must use passive strategies in our building sector.

## REFERENCES

- [1] <https://www.metalarchitecture.com/articles/passive-design-strategies>
- [2] <http://off-grid-living.com/passive-solar-design/>
- [3] <https://academic.oup.com/ijlct/article/4/3/141/710842#12498522>
- [4] <https://www.climatecolab.org/contests/2014/buildings/c/proposal/1309226>
- [5] <https://greenhome.osu.edu/passive-design>