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A Study of Climatic Influence on Building Design

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ABSTRACT

The report talks about the influence of climate on architecture and its importance while deigning the building. A brief idea on what the climate is, its types are outlines. The discussion then focuses on the questions like what happens if we don't consider climate while building, and its consequences. Influence of climate on buildings is further studied in detail by studying the housing types in Thailand and jaisalmer. On the last note it is considered that it is very important to consider climate while designing buildings to make better environment responsive architecture.

KEYWORD: climate, influence, architecture, environment, building design, comfort.

INTRODUCTION

The dictionary meaning of the word climate, "the temperature and the meteorol ogical condition of a locality". In the context of this paper we talk about climate in terms of 'micro-climate' and 'macro-climate'. Macro-climate denotes the general meteorological condition of a region or country and accounts for the major phenomena of t he region. "Micro-climate" denotes the meteorological conditions local only to a particular place, like the radiation , air currents at ground level, temperature, humidity and precipitation peculiar only to a limited area.

A review of the history of architecture may provide illustrations which will indicate the major role of climate in developing architectural char acteristics.

CLASSIFICATION OF CLIMATE

Climate is classified in a wide scale based on two atmospheric factors which dominantly influence human comfort: air temperature and humidity which was suggested by G A Atkinson in 1953.They are:

1. Warm humid equatorial climate-subgroup: warm humid island or trade wind climate
2. Hot dry desert, or semi desert climate –subgroup hot dry maritime desert climate
3. Composite or monsoon climate (combination of 1 and 2)-subgroup: tropical upland climate.

DISCUSSION

1.INFLUENCE OF CLIMATE ON ARCHITECTURE

1.1Natural Resources

Climate determines, to a large extent, what sort of natural resources are available to local architects and builders.

1.2Risk Assessment

Traditional architecture takes into account the various risks that local weather patterns may pose to people and animals. In wide-open spaces, excessive wind can easily knock over structures if no trees are present to slow the air flow. So the architect has to keep all these factors into account while designing building and make the structure studier to minimize the damage due to heavy winds.

1.3Natural Landscape

An area's local landscape and the way it is affected by climate can have a significant impact on the choices made in architecture. On land close to bodies of water, domestic dwellings can be constructed facing in the direction that allows cooling breezes from the water to create natural air circulation. In places with an abundance of trees, dwellings can be placed under the shade of their leaves to perform a similar function and provide protection from wind and rain.

2.PROOF OF CLIMATIC INFLENCE ON ARCHITECTURE

2.1EGYPT:

The earliest evidence on influence of climate on building design and town planning can be seen at Kahun,the streets sloped down to the middle, so that accumulation of rain water may be quickly drained off. The climate in Egypt has both spring and summer and the summer sun is conductive in nature ,so all the buildings are constructed using mud and they are massive, unbroken have flat roof, closely constructed .this is to make this space comfortable to the people living.

2.2GREECE:

If climate has shown a market influence on the architecture of Western Asia, it was in Greece that its influence is accepted as architectural discipline. Town planning and orientation rules were strictly followed and Greek philosophers had had written learned discourses on climatology. Xenophon had recorded notes on orientation, and Aristotle laid rules about sitting.

3.WHEN WE DON'T CONSIDER CLIMATE WHILE DESIGNING BUILDINGS

There are a lot of problems or consequences to be faced when the building is not designed with respect to climate. If there are no enough openings in a building in warm humid region then they feel uncomfortable, in a cold/polar climate if we provide many openings then also we face problems like extreme chillness inside the building.so a comfortable space can only be designed when climate and other feature are considered while designing.

Today, most of our homes and offices are poorly designed, sited, and constructed in terms of climatic realities and energy

conservation. To quote New York architect Richard Stein, too many buildings are "glass skinned heat percolators." They admit and trap the heat of the summer sun and pass manmade heat outdoors in winter. We have been compensating for such climatically poor design by brute-force heating and air conditioning. We no longer can afford to waste so much energy. According to the statistics it is said that heat released from the buildings contribute 30% to the global warming. Due to global warming we face consequences like climate inversion, natural disasters etc.

CASE SYUDY:

1.HOUSING IN HOT HUMID CLIMATE (TAILAND): Temperature ranges from

The temperature of the place varies like 27°c – 32°c(Maximum temp.) in summers and 21°c – 27°c (Minimum temp.) in winters. Humidity remains high around 75% but varies from 55% - 100%.

For comfortable space design, the orientation of the building should be such that the longer side is towards north or south. The buildings should have enough number of openings for proper ventilation and air circulation. On the east and west façade jalis are installed for the same reason.

2.HOUSING IN JAISALMER,RAJASTHAN:

The climate of this region experiences an arid climate through the year. The temperature remains low during the winter season while summers are characterized by cold and dry Jaisalmer weather. Hot winds blow during summer and sand storms are also seen.The absorbed radiation are dissipated to atmosphere at night.

The architecture of this place is having some special characteristics like having a central courtyard which acts as the main source of ventilation and most of the activities are also performed here.the ceilings are tall and are made of wood as it is bad conductor of heat. The heat inside of the building is controlled by the use of textures in Jaisalmer. The front part of the facade which remains exposed are controlled by creating deeply carved patterns. This minimizes the heat gain by providing shading due to texture. In summer in day time when the major heat source is Sun the exposed textured surfaces will be cooler than plain surfaces.In evening when ambient conditions are cool the increase surface area helps in cooling it faster. However, an extended surface will warm up faster than a plain surface under winter conditions due to low solar altitude, therefore the location in context of these surfaces is very important. In this way each and every feature is designed in accordance to climate to provide comfortable space.

CONCLUSION:

From this article we learn that climate plays an important role in building design and also it is important to construct climate responsive buildings. A good architecture is only possible if the building has good special segregation, asthetics, considers climate of the locality and other factors.

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