

Bioclimatic Houses

A lot of people and companies are now choosing eco-friendly homes. They are not inexpensive, but they will save money on energy in the long term. Some are prefabricated houses in the manner of IKEA that can be put together in days for less than \$50,000, while others need years of design and construction. Amazon has just begun producing its small dwellings, which might be useful in times of housing shortages and a desire to live a simpler life. There are several books available on tiny houses and sustainable housing.

The focus of this article is directed toward bioclimatic houses as one of the ecological types of homes that benefits from the inherent advantages it offers in terms of thermal comfort and energy savings due to the peculiarities of its design and construction.

The phrase "bioclimatic architecture" or "bioclimatic structure" is not new. For some years, sustainable and energy-efficient housing has been discussed, giving rise to the term "bioclimatic home." As a result, different interior design firms throughout the world are working on this form of building in-depth.

The passive home or passive house design is closely connected to bioclimatic dwellings. In reality, these homes, like the Passivhaus, are created using multiple criteria and approaches that allow for exponential energy savings. Bioclimatic structures, on the other hand, go a step further in terms of ecological architecture, incorporating a structural design that considers the climate, as well as the natural fauna and plants that surround the house.

Solar energy is an established attribute of bioclimatic buildings or houses, whether in the winter or the summer. To do this, the residence must be designed to maximize the hours of sunlight while simultaneously providing adequate insulation against the cold.

In an ideal world, we would be able to enjoy optimal temperature and comfort throughout the year by arranging our homes and building our rooms. All of this without using the heating or air conditioning in the winter or summer.

To take advantage of the thermal inertia of the land that surrounds them, most bioclimatic buildings are built underground or semi-buried. As a result, most of these homes are designed with thick walls that slow temperature fluctuations, air chambers that interrupt the thermal flow between the inside and outside of the building, and so on.

Recycling, for example, is critical in every passive house. As a result, the kitchen areas in this sort of home are intended to make a flawless and appropriate trash decision.

The same thing happens with technology, which has been thrust into our daily lives and is prevalent in bioclimatic homes. Any home of this sort has a home automation system to make it safer, more pleasant, and, most importantly, more energy efficient.

Having stated that bioclimatic home designs are often based on the following principles and ecological building techniques:

- Rooms that face south.
- With environmentally friendly blankets that can both recover and insulate heat in the winter.
- Its facades were created with the orientation in mind.
- To reduce the environmental effect, the perimeter is kept small.
- With enough cross ventilation and window sun protection.
- Purchase a water reuse system in high-risk regions.

- Construction of an inside patio to allow direct solar radiation to enter the home's interiors.

The most well-known and accepted bioclimatic design techniques fall into the following categories:

Orientation. The most correct shape for a building, as far as energy is concerned, is the one where small heat losses are detected in the winter, while solar gains are the least possible in the summer. It is also worth noting that the microclimate on each side of the building also plays an important role. The north side, in particular, is the coldest since it does not receive direct sunshine and the winds are blowing north during the winter. Due to solar radiation and meridian air temperatures, the west side of the building receives the same amount of solar radiation as the east. The south side, which receives sun radiation throughout the day, is both the brightest and the warmest. Rooms with lower temperature needs, on the other hand, must be situated to the north, functioning as a heat barrier, and managing the interaction between heated rooms and the outer environment. The south is the most appropriate orientation for a building's opening arrangement. In the case of Greece, the optimal plan for maximum-sunlight exploitation is extended along the East-West axis; nevertheless, any little variation of around 20° has no significant impact on the ultimate performance of the south-oriented apertures.

Shading. Shading is an important aspect of a building's architecture. The objective of shade is to limit the quantity of solar radiation that enters via the holes. Shade makes a significant contribution since it saves energy for heating and cooling the building, producing thermal comfort conditions, as well as moderating the intensity and quality of natural illumination, lowering the chance of blur. A variety of elements, including the direction, the position of the exposures, and other considerations, influence the kind and size of the system.

Renewable Energy. Solar and wind energy, geothermal energy, and biomass are all examples of renewable energy sources used in the bioclimatic design. Electricity, hot water, and efficient heating and cooling are all provided by renewable energy sources.

Thermal isolation and thermal inertia help to keep heat within the building, which reduces heat loss in the winter and solar gain in the summer. Additionally, elevated levels of thermal inertia are seen in this manner, indicating a specific defense of the structure against external temperature variations. Mass walls, thermal storage walls, and Trombe walls are examples. A bioclimatic construction, on the other hand, is slightly more expensive than an older or conventional one. In any event, energy savings provide significant returns in the long term when compared to the building's initial cost. As a result, the advantages of this design are both energy, economic, and environmental. However, attention and good design are required to accomplish all of the above.

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