

**INTEGRATION OF PRINCIPLES OF BIOMORPHIC ARCHITECTURE
FOR USER'S THERMAL COMFORT IN THE DESIGN OF OFFICE
BUILDING IN ABUJA, NIGERIA**

BY

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ABSTRACT

Thermal comfort is a major concern as it affects energy demand in most tropical buildings. Recently, there has been an increase in the amount of energy usage to achieve comfort in office building due to reliance on mechanical means of ventilation and cooling. This usual energy usage may result to continuous release of carbon dioxide (CO₂) into the atmosphere which can lead to ozone layer depletion. The new awareness for eco-friendly design has fostered biomorphic architectural principles which is an option to overtake air-conditioned system to ensure comfort and also reduce building energy consumption. This study seeks to assess biomorphic architectural techniques for user's thermal comfort in high-rise office complex with a view to develop a design that ensures user's comfort and is energy efficiency. A descriptive survey method was adopted for the research and a structured observation schedule with variables focusing on biomorphic technique was adopted. Data obtained were documented and analysed using Microsoft excel package. The result shows that windows and glazed façade serves as the major source of openings used to ensure natural light and ventilation. Human inspired form and habitat inspired form were only adopted but there is need for more awareness to promote biomorphic architecture. Grasses, shrubs and indoor plant are major vegetations used with a need to increase the numbers of trees, and hedges to ensure a cool and conducive environment. Also, passive solar control measure used was majorly fins and deep verandah with need to intensify on the usage of other form of shading element. Fountain was the only water element used at the selected office building. The study shows there is need to incorporate adequately element of biomorphic architecture to improve user's thermal comfort. It therefore recommends that architects should adopt effectively building openings through the use of courtyard or ventilated atria which allows natural ventilation, lighting and cooling of the building; adequate planting of trees, shrubs, hedges and indoor plant to reduce heat gain and provision of water bodies as evaporative cooling element. There is need to adopt biomorphic form to simulate natural environment. All these techniques should be greatly encouraged and adopted in office buildings to achieve desirable thermal comfort environment, reduce building energy usage while improving user's productivity.

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