

Reduce the Environmental Impacts of the Intensive Use of Glass in New Buildings in Khartoum, Sudan

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Abstract : Khartoum is considering as one of the hottest cities all over the world, the mean monthly outdoor temperature remains above 30 °C. Solar Radiation on Building Surfaces considered within the world highest values. Buildings in Khartoum is receiving huge amounts of watts/m². Northern, eastern and western facades always receive a greater amount than the south ones. Therefore, these facades of the building must be better protected than the others. One of the most important design limits affecting indoor thermal comfort and energy conservation are building envelope design, self-efficiency in building materials and optical and thermo-physical properties of the building envelope. A small sun-facing glazing area is very important to provide thermal comfort in hot dry climates because of the intensive sunshine. This study aims to propose a work plan to help minimize the negative environmental effect of the climate on buildings taking the intensive use of glazing. In the last 15 years, there was a rapid growth in building sector in Khartoum followed by many of wrong strategies getting away of being environmental friendly. The intensive use of glazing on facades increased to commercial, industrial and design aspects, while the glass envelope led to quick increase in temperature by the reflection affects the sun on faces, cars and bodies. Logically, being transparent by using glass give a sense of open spaces, allowing natural lighting and sometimes natural ventilation keeping dust and insects away. In the other hand, it costs more and give more overheated. And this is unsuitable for a hot dry climate city like Khartoum. Many huge projects permitted every year from the Ministry of Planning in Khartoum state, with a design based on the intensive use of glazing on facades. There are no Laws or Regulations to control using materials in construction, the last building code -building code 2008- Khartoum state- only focused in using sustainable materials with no consider to any environmental aspects. Results of the study will help increase the awareness for architects, engineers and public about this environmentally problem. Objectives vary between Improve energy performance in buildings and Provide high levels of thermal comfort in the inner environment. As a future project, what are the changes that can happen in building permits codes and regulations. There could be recommendations for the governmental sector such as Obliging the responsible authorities to version environmental friendly laws in building construction fields and Support Renewable energy sector in buildings.

Keywords : building envelope, building regulations, glazed facades, solar radiation

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