

Improvement of Thermal Comfort Conditions in an Urban Space "Case Study: The Square of Independence, Setif, Algeria"

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Abstract : Several studies all around the world were conducted on the phenomenon of the urban heat island, and referring to the results obtained, one of the most important factors that influence this phenomenon is the mineralization of the cities which means the reducing of evaporative urban surfaces, replacing vegetation and wetlands with concrete and asphalt. The use of vegetation and water can change the urban environment and improve comfort, thus reduce the heat island. The trees act as a mask to the sun, wind, and sound, and also as a source of humidity which reduces air temperature and surrounding surfaces. Water also acts as a buffer to noise; it is also a source of moisture and regulates temperature not to mention the psychological effect on humans. Our main objective in this paper is to determine the impact of vegetation, ponds and fountains on the urban micro climate in general and on the thermal comfort of people along the Independence square in the Algerian city of Sétif, which is a semi-arid climate, in particular. In order to reach this objective, a comparative study between different scenarios has been done; the use of the Envi-met program enabled us to model the urban environment of the Independence Square and to study the possibility of improving the conditions of comfort by adding an amount of vegetation and water ponds. After studying the results obtained (temperature, relative humidity, wind speed, PMV and PPD indicators), the efficiency of the additions we've made on the square was confirmed and this is what helped us to confirm our assumptions regarding the terms of comfort in the studied site, and in the end we are trying to develop recommendations and solutions which may contribute to improve the conditions for greater comfort in the Independence square.

Keywords : comfort in outer space, urban environment, scenarisation, vegetation, water ponds, public square, simulation

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