Abstract

The biological process of evapotranspiration and photosynthesis in plants removes heat and carbon dioxide present in the environment, so that the plants may generate oxygen and moisture. However, decrease in the quantity of trees worldwide has caused global temperatures to rise and icebergs to melt. Other than problems like green house effect and global warming which had been well established, another cause for worry is the Urban heat Island (UHI) effect. This UHI effect primary occurs in cities. The cause of the UHI have been attributed to the increase in hard surface areas which absorbs and re-radiate heat from the surrounding. Another source of heat, other than the sun, is the heat generated from the air-conditioning units in buildings. The high demand in cooling load has not only caused temperatures to increase, but also incur high cost due to energy consumption.

The concept of rooftop gardens are introduced with the aim of reducing heat gain into a building. The plants present in the garden remove heat through photosynthesis and evapotranspiration. Results from this study suggest that rooftop gardens can efficiently cool down the immediate environment by 1.50°C. Generally, the temperature readings collected from the rooftop garden were found to be lower than the temperature recorded at a barren concrete rooftop. This shows that the thermal insulation of a building is improved in the presence of plants. The energy cost of the building is reduced as a result.

High relative humidity (RH) of 85% at the rooftop garden was observed. To prevent discomfort due to high humidity, there should be adequate ventilation in the region.