

The Perception of Cooling Roofs among Professionals in Iran

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ABSTRACT

A large amount of energy in Iran is currently being consumed for heating and cooling purposes in buildings. Since building rooftop surfaces absorb most of the solar radiation, green roofs are among the solutions recommended by scholars. This study utilizes a survey amongst a targeted sample population of 40 built environment professionals to determine their perception on the use of green roof for environmental cooling purposes. They believed that green roofs could improve the ecology and the biodiversity of an urban area. Green rooftops are also believed to have the capability to reduce air pollution and urban heat island, and help reduce solar radiation and energy consumption in Iranian cities. The best choices for implementation include flat asphalt, flat concrete, and flat tile roofs. The study recommends further study on developing a green rooftop policy for Iran that would improve the quality of life for people living in cities of Iran.

Keywords: Green Roof Effect, Solar Radiation, Energy Consumption

1. INTRODUCTION

Iran is considerably a dry and semi-arid country where two third of the country is comprised of desert and semi-desert areas. The high temperature during the hot season in Iran is the greatest challenge in cooling down residential and official buildings in cities because heating and cooling consume the highest amount of energy at the expense of environmental quality. Moreover in the last decade (1990s to 2000s) the space left to the greenery in the urban landscape has decreased, allowing the uncontrolled growing of roads and buildings. The most worrying effects are the worsening of the air quality and the increasing average of the urban temperature (Abbaspour, 1998).

Rooftop and wall surfaces play a significant role in the ecological functioning of urban environment. According to Peck (2002) and Earth Pledge Foundation (2005), the solar radiation energy absorbed via rooftop can increase energy

consumption and cooling costs. Rooftops cover a big area of the cities, but after the employment of green roof the heat will be reduced notably and the cost reduction for cooling of houses is remarkable (Wong, et al., 2003b).

The highest amount of energy consumption is for heating and cooling purposes in buildings in cities such as Tehran with a population of 12 million. It is even higher than the total energy consumed in the transportation, industrial and agricultural sections. Based on the annual statistics data, Iranian Fuel Conservation Organization (IFCO, 2004a) states that buildings consume nearly USD 9.6 billion of energy per year in Iran, which is about 40% of energy consumed in the country. Annual cooling cost across the country is USD 211 million which is 16% of the electricity consumption of the country. According to the report from House and Building Research Centre in Iran, more than 83% of houses in Tehran did not comply with energy saving regulations (Javanbakht, 2006).

Seeking professionals' perceptions ought to shed more light on the stated problem. This is carried out through several viewpoints by the questionnaire. As the phenomenon is still considered to be a relatively new field of inquiry, viewpoints of experienced professionals are of utmost value. Their perceptions regarding the problem are significance to researchers looking for solutions for the infrequent use of green roofs in Iran. Their experience is the result of a direct longitudinal exposure to the society's practice with green roof. These perceptions are carefully probed in this research project.

This paper first presents the background literature on Iran's energy crisis and current works on passive cooling practice with emphasis on green roof. Then, it describes the survey research methodology this study utilizes, presents the results, and concludes with future recommendations for further studies.

