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Reducing the Urban Heat Island Effect by Urban Design Strategies: Case Study of Aksaray Square in Istanbul

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Abstract : Urban heat island term becomes one of the most important problem in urban areas as a reflection of global warming in local scale last years. Many communities and governments are taking action to reduce heat island effects on urban areas where the half of the world's population live today. At this point, urban design turned out to be an important practice and research area for providing an environmentally sensitive urban development. In this study, mitigating strategies of urban heat island effects by urban design are investigated in Aksaray Square and surroundings in Istanbul. Aksaray is an important historical and commercial center of Istanbul, which has an increasing density due to be the node of urban transportation. Also, Istanbul Metropolitan Municipality prepared an urban design project to respond the needs of growing population in the area for 2018. The purpose of the study is emphasizing the importance of urban design objectives and strategies that are developed to reduce the heat island effects on urban areas. Depending on this, the urban heat island effect of the area was examined based on the albedo (reflectivity) parameter which is the most effective parameter in the formation of the heat island effect in urban areas. Albedo values were calculated by Albedo Viewer web application model that was developed by Energy and Environmental Engineering Department of Kyushu University in Japan. Albedo parameter had examined for the present situation and the planned situation with urban design project. The results show that, the current area has urban heat island potential. With the Aksaray Square Project, the heat island effect on the area can be reduced, but would not be completely prevented. Therefore, urban design strategies had been developed to reduce the island effect in addition to the urban design project of the area. This study proves that urban design objectives and strategies are quite effective to reduce the heat island effects, which negatively affect the social environment and quality of life in urban areas.

Keywords : Albedo, urban design, urban heat island, sustainable design
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