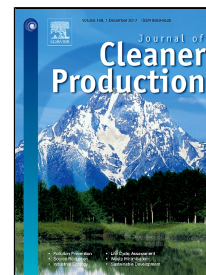


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## Coping with the impacts of Urban Heat Islands

### A literature based study on understanding urban heat vulnerability and the need for resilience in cities in a global climate change context

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#### Abstract

The urban heat island (UHI) is a phenomenon whereby temperature levels in urban areas are higher than in surrounding rural settings. Urban heat islands are a matter of increasing concern, since they can affect communities by exacerbating air pollution and greenhouse gas emissions (due to the greater use of air conditioning) and the occurrence of heat-related illness, and may lead to higher levels of mortality. This paper provides a description of the phenomena of (UHI) and an analysis of how cities are vulnerable to it. It highlights the need for resilience and the variety of means by which the UHI can be tackled. It describes a set of trends in two regions in Germany and Australia, which illustrate the scope of the problem in the northern and southern hemispheres, and the scale of vulnerability. Then, existing UHI vulnerability assessments are analysed to highlight common features and differences. Based on this, we propose a classification of adaptability parameters to support vulnerability assessments. The paper also discusses current mitigation approaches mentioned in the literature, and how these address some vulnerabilities. It concludes that both a better understanding of the UHI phenomena and consideration of the particular context of each city is needed to make urban areas more resilient to UHI.

#### Keywords

Urban Heat Island; vulnerability; cities; climate change; mitigation; adaptation

## 1. Introduction

The urban heat island (UHI) effect can be defined as higher temperatures within urban areas compared to their surroundings; however, elevated temperature effects are combined with changes in precipitation patterns, climate extremes as well as impacts of air pollution in

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