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The Urban Sectorization of Lúcio Costa's Modernism and the Emergency of Heat Islands in the Capital of Brazil

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Abstract

The aim of the article is to present a new approach for understanding the urban design effects on heat island phenomena, studying the case of the city of Brasilia. Satellite images and comparing simulations from two distinct areas of the capital are used as basis of the hypothesis that the urban planning of the city favoured its emergency of heat islands. The satellite image is adopted to provide a greater scale of the current scenario, gathering different sectors of the modernist city. At the same time, the simulations offer a closer view of the working and habiting sectors, demonstrating practically in which way the space configuration and materiality of those corroborate to change the urban climate.

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Keywords: Brasilia; heat island; modernism; urban planning.

1. Introduction

The concern about the urban climate and its direct influence in how the individual experiences the city are some issues that have been intensified throughout the 21st century, starting from the crescent transformations in the economic, social and spatial fields of the city. Therefore, the undeniable masterless cities growth – tending towards greater vertical growth – intensifies the problems related to urban climate, with a strong impact on thermal discomfort, felt by the individual inside both buildings and open spaces.

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> *"The urbanization of the natural landscape_roads, bridges, dams, houses, and highcentury, rises_has dramatically altered its waters, soils, and vegetation. In fact, the most stereotypicaily "urban" characteristics of cities are also those which can cause temperatures to rise. By replacing vegetation and soil with concrete and asphalt, we reduce the landscape's ability to lower daytime temperatures through evapotranspiration, and lose the obvious benefits of shade. And by using dark-colored materials on roads, buildings, and other surfaces, we create entire cities that absorb, rather than reflect, incoming solar energy."*
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> United States Environmental Protection Agency, 1992

From early studies, it was noticed that the way society was evolving into great urban centers could not be benefic to the environment with ease. The means of occupation in which the metropolis were growing altered irreversibly the world's climate. Being so, the continuous need to study and treat those changes results in most part of this study – and the choice of the capital of Brazil was not occasional. Lúcio Costa, a Brazilian modernist architect, authors Brasilia's project. The city was built from the concept to materialize the modernist utopia.

2. Modernist Cities: The Case of Brasilia

The modernist movement marks the beginning of a new era for architecture. Ever since the European vanguards, the principles in which arts in general were based changed radically[1]. The great world wars came along and reinforced that society was changing and its means of expression had to change as fast as possible.

> *"By Modernism I mean the positive rejection of the past and the blind belief in the process of change, in novelty for its own sake, in the idea that progress through time equates with cultural progress; in the cult of individuality, originality and self-expression."*
>
> Dan Cruickshank, 2009

The new approach on the way society must live despised the way ornaments and aesthetics had been treated for centuries as the main goal of the human arts and crafts. Functionality, in this way, should gain more importance in the processes of the modern world. At the same time, this revolutionary thinking guided technology and scientific knowledge. The usage of machinery to make daily life easier was a remarkable achievement, given the industrial revolution all Europe had been through.

Another paradigm in which this new era was based was the intense exchange of products, culture and information amongst all the civilization. In this way, the entire world was influenced somehow by this revolutionary context, and to catch up with this constant evolution turned out to be essential.

In this way, architecture all around the world started to adapt to this new dynamic reality. The new buildings had to approach the denial of the past as the best way to prepare for the future. In urban planning, the goal could not be different. With the continuous expansion of the Modern Movement, and, consequently, Modern Architecture, others mean of expression started to become obsolete[2].

Considering this scenario, the old idea to move the capital from Rio de Janeiro towards the center of the country, in order to occupy the region known as Centro-Oeste and protect the government basis from overseas attacks, gained more strength. Later on, in the late 50s, the contest for the future capital of Brazil was released.

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[1] Eksteins in his book "Rites of Spring: The Great War and the Birth of the Modern Age" concludes artists of that time were trying to identify a broad wave of sentiment and endeavour. (p. 16)

[2] Michael Ebbert and Fionn Mackillop wrote (2013, International Journal of Urban and Regional Research) "It was a time when many aspects of Modern Movement were being taken up and routinized for better or worse".