# Chapter 51

# City Landscape:
## Confluence Between Ecological Conditions and Urban Morphology in the City of Lisbon

**Ana Cristina Lourenço**
*University of Lisbon, Portugal*

## ABSTRACT

*This chapter aims to describe the urban morphology of the city of Lisbon within its identity creation process throughout time, according to an ecological condition approach. Based on a new landscape interpretation model, it aims to contribute to a better understanding of the current sustainability issues of the urban landscape (as a system of systems), following an interrelated analysis of the confluence between how it functions ecologically and human occupation processes. It is, therefore, a useful contribution to spatial planning decisions and policies transposed into territorial management tools, particularly with regard to urban ecosystem services: improved urban life and the introduction of positive elements that are economically measurable for better management of the city and reduced risk.*

## INTRODUCTION

This chapter results from the research project for the Ph.D. studies in Landscape Architecture by the Institute of Agronomy of the University of Lisbon (ISA-UL), integrated into LEAF Landscape, Environment, Agriculture, and Food Research Laboratory of the Institute University of Lisbon (ISA-UL), research topic on Green and Blue Infrastructures.

The research subject is the landscape of the city, supported by a case study focusing on the Lisbon landscape. The case study is carried out based on the System-Landscape methodology (Magalhães, 2001) whereby landscape is a unifying and cultural concept, capable of integrating different branches of knowledge and therefore the complexity of territories and its occupation processes.

This motivation stems from the current need to improve the performance of cities regarding their sustainable exploitation of resources. In fact, particularly in the second half of the twentieth century, the

territory was massively urbanized, so that a balance of natural resources was often forced, disrespecting nature's regeneration mechanisms and rhythms. Moreover, these multiple and successive urbanization processes frequently resulted in fragmented, dysfunctional and disqualified landscapes with poor performance, including from an ecological point of view.

The search for measures to mitigate these harmful effects – i.e. the urban heat island and lack of comfort - showed the importance of urban design based on ecological principles. This is an essential component in terms of the quality of urban life and sustainable management of natural resources and ensures greater comfort and the regulation of the urban climate.

In this context, the Landscape of the City of Lisbon is the starting point for this research work, the main goal of which is to formulate a Landscape Interpretation Model that will help to understand the interactions between the urban morphologies and the ecological condition of the landscape.

This chapter focuses on the analysis of the morphology of Lisbon - developed in a GIS environment as an auxiliary tool - and its identity creation process throughout time, according to an ecological condition approach. This exercise has provided a better understanding of the current sustainability issues of the urban landscape (as a system of systems), following an interrelated analysis of the confluence between how it functions ecologically and the human occupation processes.

Thus, research has focused on the following specific objectives:

1.  To identify how the ecological functioning of the landscape is interpreted by the cultural components of the landscape, exploring how these variables have been combined, over time, according to the contexts and conceptual models that have supported the development of the city of Lisbon;
2.  To formulate a Landscape Interpretation Model as a contribution in helping to redefine criteria and methodologies to intervene in the city landscape.

This model can be replicated and its main potential relies on empowering the ecological dimension with regard to the design of urban morphologies. In this way, this research seeks to optimize existing resources – permeable soil, water, and energy - as a support for urban design and planning and management tools in the city of Lisbon, thus producing ecosystem services for the community and improving the urban quality of life as well as reducing risk.

## BACKGROUND

### Landscape as a Cultural Concept

In general, the evolution of the landscape concept reflects how humanity has related to the world and to nature in particular. In the western world, the concept of landscape emerges with the dawn of the Modern Age (Maderuelo, 2005; Berque, 2011). With the Renaissance came the development of rationality, enabling man to observe and study nature. Man remains an outsider observing nature, and landscape painting is an artistic expression that explores this duality, made possible thanks to the discovery of perspective techniques.

After the Industrial Revolution, the landscape changed from representing nature to it being nostalgically evoked due to an increasing anthropization that frequently disrespected the cycles of natural life.

26 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage: www.igi-global.com/chapter/city-landscape/222943

# Related Content

### Technology and the Multipolar Global Economy: Implications for European Competitiveness

Steven McGuire (2013). *Geographic Information Systems: Concepts, Methodologies, Tools, and Applications  (pp. 108-121).*

www.irma-international.org/chapter/technology-multipolar-global-economy/70438

### Urban Development Modelling: A Survey

Asma Gharbi, Cyril De Runzand Herman Akdag (2017). *Handbook of Research on Geographic Information Systems Applications and Advancements (pp. 96-124).*

www.irma-international.org/chapter/urban-development-modelling/169986

### Remote Sensing Image Classification Using Fuzzy-PSO Hybrid Approach

Anasua Sarkarand Rajib Das (2019). *Geospatial Intelligence: Concepts, Methodologies, Tools, and Applications  (pp. 636-669).*

www.irma-international.org/chapter/remote-sensing-image-classification-using-fuzzy-pso-hybrid-approach/222920

### Understanding Health Disparities through Geographic Information Systems

Samuel Soret, Karl J. McCleary, Patrick A. Riversand Susanne B. Montgomery (2003). *Geographic Information Systems and Health Applications (pp. 12-42).*

www.irma-international.org/chapter/understanding-health-disparities-through-geographic/18833

### Embedding Work Culture in Building Information Modelling (BIM) for Enhancing Collaboration in Global Projects

Maszura Abdul Ghafar, Rahinah Ibrahim, Zalina Shariand Farzad Pour Rahimian (2013). *International Journal of 3-D Information Modeling (pp. 16-29).*

www.irma-international.org/article/embedding-work-culture-in-building-information-modelling-bim-for-enhancing-collaboration-in-global-projects/89441