

Smart Lighting System Installation in Cycladic Islands: the case of Ano Syros

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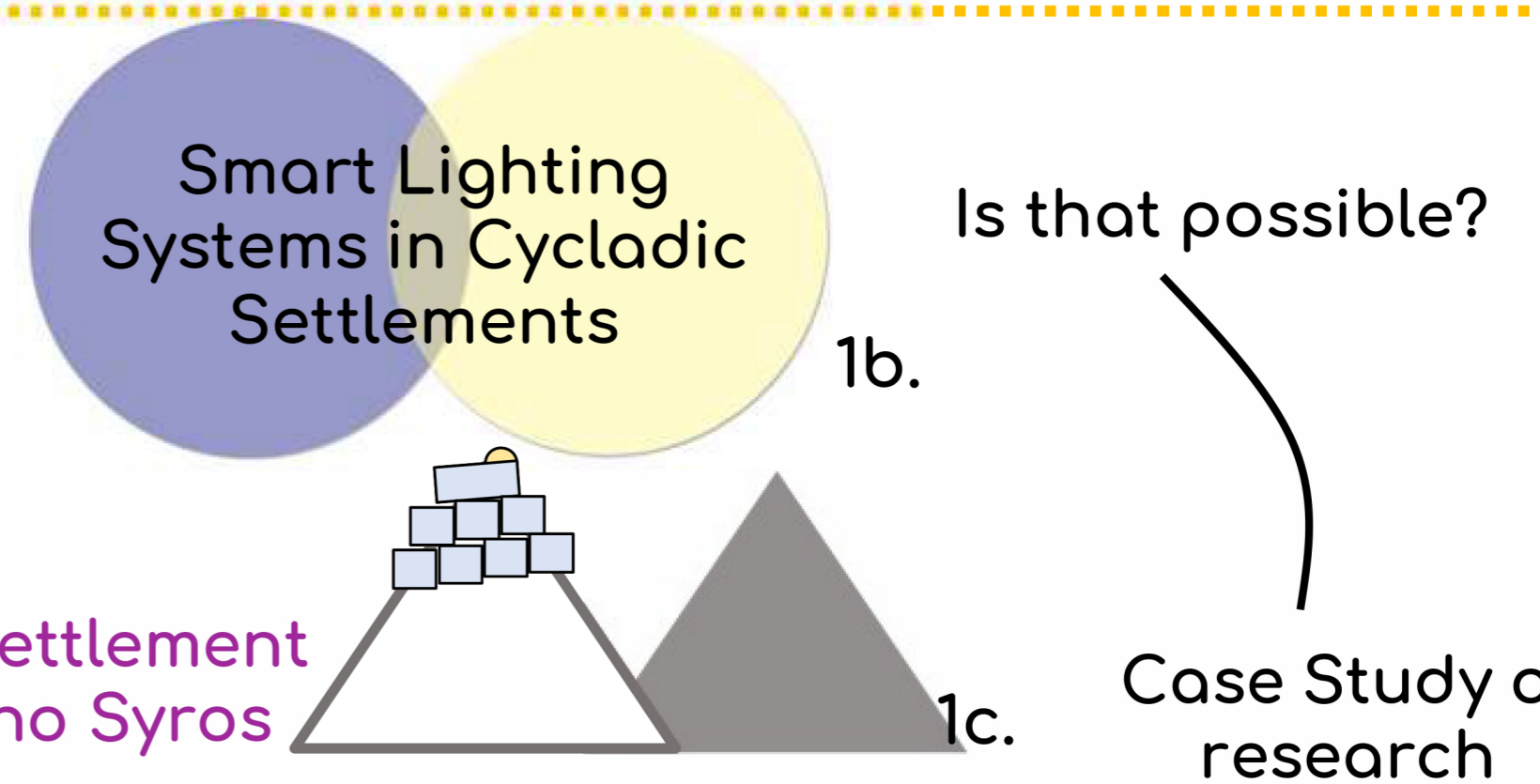
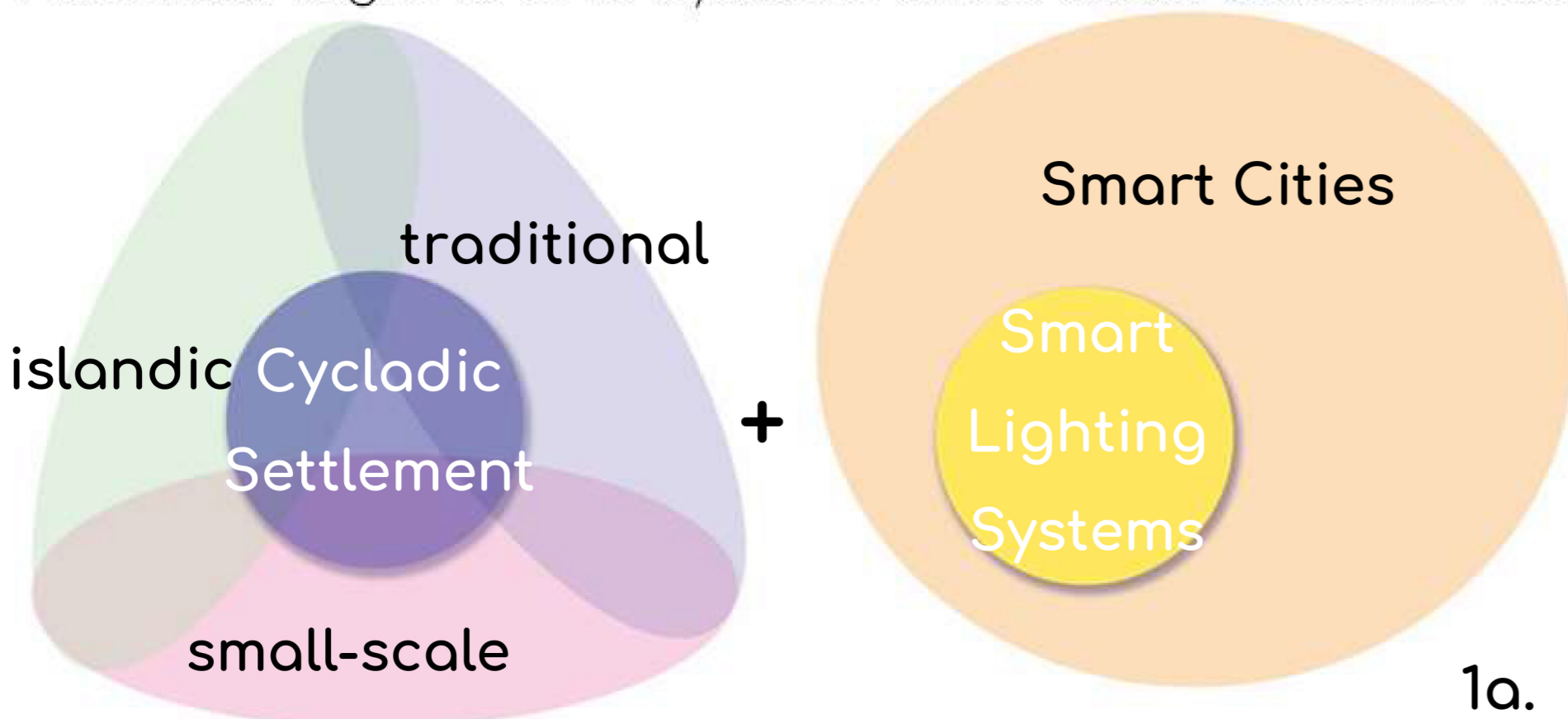
The current research investigates the possibility of applying Smart Lighting Systems (SLS) in small-scale traditional island settlements. The study focuses on the Cycladic islands, an area characterized by its distinct architectural character and the limitations in the interventions allowed. Moreover, the requirements for a SLS installation, its structure as well as the benefits and drawbacks at an economic, environmental, energy-saving and social level of such systems are analysed. The case study of this research is the traditional settlement of Ano Syros. The goal of this project is to create a model of analysis and management, suitable to be applied on every Cycladic settlement that follows this unique structure. The outcome lists the benefits of such an installation at a financial, environmental and social level.

Introduction

Smart Cities and their applications are widely spread in mainland areas all around the world. This study however examines:

- The possibility a small-scale, declared traditional, island settlement's public lighting conversion into a SLS
- The requirements and necessary adjustments for such a conversion
- The benefits and drawbacks at financial, social and environmental level.

The method followed is clarifying the terms of "smart city", "smart lighting systems" and their positive and negative aspects. Furthermore, the parameters and the specialties of the declared "traditional and historical regions" and Cycladic small-scale settlements are studied.



Regarding the settlement of Ano Syros as the case studied, a fully detailed personal imprint takes place. An in-situ research about the differences between these settlements and the mainland is also accomplished.

Figures 1a-1c: Methodology's Diagram, created by the author (Maragkou Anna)

Current situation



Figures 2-4: Draftness of installation // Figure 5: Private & Public Lighting // Figures 8-9 Luminaires' types, photos from personal file

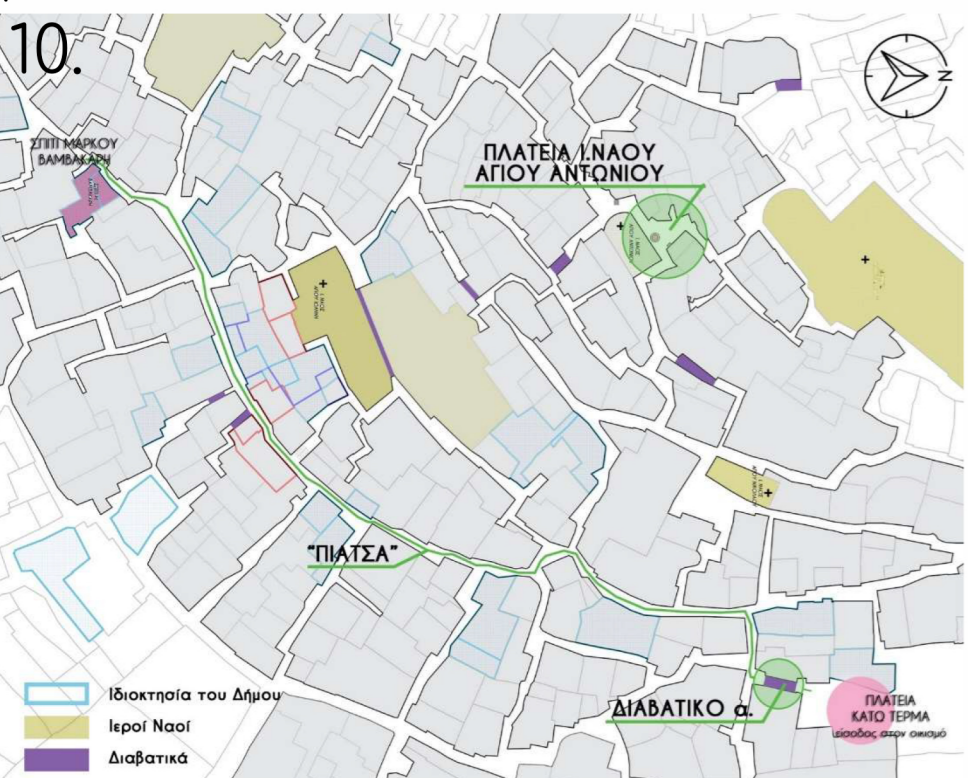


Figure 10: Extract of Ano Syros' map, showing the studied areas, created by the author (Maragkou Anna)

Aims of the lighting design study for Ano Syros

- o Optimization of local population's quality of living
- o Prevention of settlement's deserting during low-season period
- o Pointing out the main spots of interest without altering the settlement's architecture
- o Highlighting of passages and facilitation of visitors' orientation
 - o Boost a sense of security
 - o Applied uniformity on the lighting equipment's design and the lighting outcome
- o Keep out residents' privacy
 - o Energy saving
 - o Remote control

Minimum Required Features

- o RULO < 0
- o CCT < 3000K
- o High Value of IP for < humidity, at least IP66
- o Pedestrian paths: 5-10lux
- o High Value of IK for < strong winds at least IK07
- o Open-sided covered walkways: 30-50lux

Through a sensitive but also realistic point of view, the installation of a SLS in such a special region is considered feasible, however a full-detailed imprint and study is needed. The Cycladic islands can be highly benefitted at financial, environmental and social level. It is worth mentioning that, a great number of adjustments during the manufacturing and installation of the equipment are necessary, in order that the mechanisms and technology that constitute the structure and function of an SLS correspond with the particular characteristics of these settlements. The selection of the equipment's type and features should be also strictly defined.

- o Maragkou, Skandali, Drakou, (2022) *Smart Lighting System's installation in Cycladic Islands – case study on Syros*, Master Thesis, School of Applied Arts and Sustainable Design, HOU, Athens
- o Kopanari, Sigala, Skandali, (2019) *Urban lighting in historic settlements: from quality lighting to cultural reinforcement*, IEEE
- o Matsoukis, Stratis, (2017), *Smart Lighting of Outdoor Spaces and Smart Cities*, Master Thesis, School of Applied Arts and Sustainable Design, HOU, Patra