

Climamed 2017 – Mediterranean Conference of HVAC; Historical buildings retrofit in the Mediterranean area, 12-13 May 2017, Matera, Italy

Microclimate of territory of Matera and the heat island effect

Gianluca Rospi^{a*}, Elisabetta Negro^a, Tiziana Cardinale^b, Nicola Cardinale^a

^aUniversità degli Studi della Basilicata, Dipartimento delle Culture Europee e del Mediterraneo, Via Lazzizzera snc, Matera, 75100, Italy

^bCentro Ricerche Enea Trisaia, S.S. 106 Ionica, km 419+500, Rotondella (MT), 75026, Italy

Abstract

This work is focused on micro-climate analysis of the Matera town. We carried out several measurement campaigns of climate parameters in summer and winter season by measuring temperature and relative humidity. These analyses show that, in the historical center, the temperature values are greater than in areas with presence of vegetation.

We analyzed the temperature and relative humidity trend of the last seven years. The average seasonal temperatures rise, due to an increased use of air conditioners, causes the growth of urban temperatures.

The sparse vegetation present in the town center does not allow the dissipation of the latent heat.

© 2017 The Authors. Published by Elsevier Ltd.

Peer-review under responsibility of the scientific committee of the Climamed 2017 – Mediterranean Conference of HVAC; Historical buildings retrofit in the Mediterranean area

Keywords: global warming; urban heat island; materials; vegetation; microclimate

1. Introduction

Since the industrial revolution until today, the west governments, before, and emerging countries, after, inputted a vast quantity of CO₂ in the atmosphere. This caused an increase of the global mean temperature with effect on the ices melting and increase of the level sea. In the period 1990-2005 it was measured an increase of environment global mean temperature of about 0.3 °C. The estimates done by different research institutes predict an increase trend of 1.8–2.0 °C in 2100 year.

* Corresponding author. Tel.: +39 3480359241 ; fax: +0-000-000-0000 .

E-mail address: gianluca.rospi@unibas.it

To contrast this phenomenon, the principal countries responsible of the CO₂ emission signed the Kyoto protocol and the European Union promoted many laws to contrast the increase of the CO₂ concentration in the atmosphere. A cause connected with the climate change is the phenomenon of the heat island in the cities (phenomenon described in the five relation of the IPCC Assessment AR5). Man activities (industrial production, vehicular traffic, thermal plants, etc.) influence the urban micro-climate producing an increase of the temperature and pollution.

Climate change is a threat and, at the same time, a new challenge for the twenty-first century town, projected in a scenario of strong fragility of the environmental system.

Different studies stated that the increase of people and buildings in the town, in restricted area of territory, causes a different characterization of the urban climate from that of the surrounding rural areas (Fig. 1). This phenomenon is due to different weather variables, particularly the range of temperatures. The so-called Urban Heat Island Effect depends on how the town is built, the materials employed, how the streets and buildings are arranged, as well as the level of heat generated by the combustion of hydrocarbon for the transportations and domestic uses. The geometry of streets and buildings, their shape and height (canyon effect) entrap the heat in the façade of the buildings and the streets, before releasing it in the atmosphere (Fig. 2) [1].

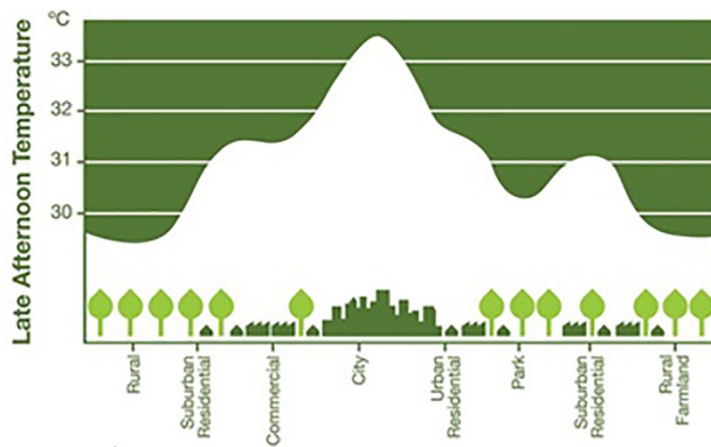


Fig. 1- The profile of the Urban Heat Island.

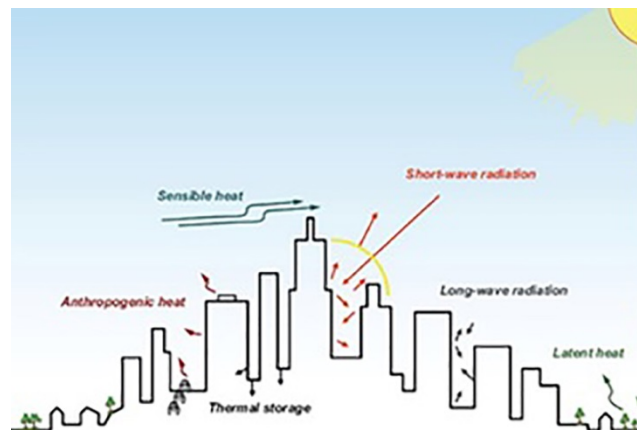


Fig. 2 - Energy exchanges within the town.

The authors in the 2013 year performed the anemological analysis of the Murgia Park of Matera for one year. They verified the principal direction and intensity of wind [2].

Download English Version:

<https://daneshyari.com/en/article/7918670>

Download Persian Version:

<https://daneshyari.com/article/7918670>

[Daneshyari.com](https://daneshyari.com)