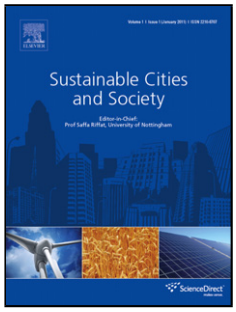

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Operating an environmentally sustainable city using fine dust level big data measured at individual elementary schools

Pyoung Won Kim[1]

Abstract

As the problem of fine dust pollution becomes increasingly serious in South Korea, the country is becoming more interested in obtaining information on fine dust levels. Fine dust level data are sufficiently local to make regional forecasting meaningless. Thus, this study proposes an alternative measurement technique to minimize differences between published and perceived levels of fine dusts. Owing to the large variations in the fine dust levels within urban areas, it is very difficult to provide measurements that are sufficiently area-representative. Because infants and elementary school students are more sensitive to fine dust than adults, it is useful to construct large data sets of measurements of fine dust levels at elementary schools. In Korea, the distribution of elementary schools is consistent with population density, which is useful for analyzing local differences in the fine dust levels in urban areas. This study will provide a basis for big data application to public health policy and infographics using color fuzzy model.

Keywords: Fine Dust, Big Data, Sustainable City, Public Health Policy, Infographics, Color Fuzzy model

1. Introduction

As air pollution becomes increasingly serious, it is becoming very important to collect and promulgate air pollution data. In particular, fine dust particles must be carefully measured and their dispersion forecast as they can have dangerous, even fatal, effects on the human body. Fine dust particles represent a threat to the human respiratory and immune systems. The incidence of fine dust particles smaller than 10 μm in diameter, also known as PM10 particles, is increasing rapidly, and the presence of concentrated ions can increase a fine dust alert level to "very bad," the highest level of danger on the air quality scale of the National Institute of Environmental Research (Korean Meteorological Administration 2016) (on this scale, a value from zero to 30 is "good," 31 to 80 is "normal," 81 to 120 is "slightly bad," 121 to 200

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