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'Urban green space affects citizens' happiness'

Study finds the relationship between green space, the economy, and happiness

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Summary: A recent study revealed that as a city becomes more economically developed, its citizens' happiness becomes more directly related to the area of urban green space.

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FULL STORY

A recent study revealed that as a city becomes more economically developed, its citizens' happiness becomes more directly related to the area of urban green space.

A joint research project by Professor Meeyoung Cha of the School of Computing and her collaborators studied the relationship between green space and citizen happiness by analyzing big data from satellite images of 60 different countries.

Urban green space, including parks, gardens, and riversides not only provides aesthetic pleasure, but also positively affects our health by promoting physical activity and social interactions. Most of the previous research attempting to verify the correlation between urban green space and citizen happiness was based on few developed countries. Therefore, it was difficult to identify whether the positive effects of green space are global, or merely phenomena that depended on the economic state of the country. There have also been limitations in data collection, as it is difficult to visit each location or carry out investigations on a large scale based on aerial photographs.

The research team used data collected by Sentinel-2, a high-resolution satellite operated by the European Space Agency (ESA) to investigate 90 green spaces from 60 different countries around the world. The subjects of analysis were cities with the highest population densities (cities that contain at least 10% of the national population), and the images were obtained during the summer of each region for clarity. Images from the northern hemisphere were obtained between June and September of 2018, and those from the southern hemisphere were obtained between December of 2017 and February of 2018.

The areas of urban green space were then quantified and crossed with data from the World Happiness Report and GDP by country reported by the United Nations in 2018. Using these data, the relationships between green space, the economy, and citizen happiness were analyzed.

The results showed that in all cities, citizen happiness was positively correlated with the area of urban green space regardless of the country's economic state. However, out of the 60 countries studied, the happiness index of the bottom 30 by GDP showed a stronger correlation with economic growth. In countries whose gross

national income (GDP per capita) was higher than 38,000 USD, the area of green space acted as a more important factor affecting happiness than economic growth. Data from Seoul was analyzed to represent South Korea, and showed an increased happiness index with increased green areas compared to the past.

The authors point out their work has several policy-level implications. First, public green space should be made accessible to urban dwellers to enhance social support. If public safety in urban parks is not guaranteed, its positive role in social support and happiness may diminish. Also, the meaning of public safety may change; for example, ensuring biological safety will be a priority in keeping urban parks accessible during the COVID-19 pandemic.

Second, urban planning for public green space is needed for both developed and developing countries. As it is challenging or nearly impossible to secure land for green space after the area is developed, urban planning for parks and green space should be considered in developing economies where new cities and suburban areas are rapidly expanding.

Third, recent climate changes can present substantial difficulty in sustaining urban green space. Extreme events such as wildfires, floods, droughts, and cold waves could endanger urban forests while global warming could conversely accelerate tree growth in cities due to the urban heat island effect. Thus, more attention must be paid to predict climate changes and discovering their impact on the maintenance of urban green space.

"There has recently been an increase in the number of studies using big data from satellite images to solve social conundrums," said Professor Cha. "The tool developed for this investigation can also be used to quantify the area of aquatic environments like lakes and the seaside, and it will now be possible to analyze the relationship between citizen happiness and aquatic environments in future studies," she added.

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1. Oh-Hyun Kwon, Inho Hong, Jeesurk Yang, Donghee Y. Wohn, Woo-Sung Jung, Meeyoung Cha. **Urban green space and happiness in developed countries**. *EPJ Data Science*, 2021; 10 (1) DOI: 10.1140/epjds/s13688-021-00278-7
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