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Assessing the Impacts of Land Use Diversity on Urban Heat Island in New Cities in Egypt, Tiba City as a Case Study

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Abstract:

Egypt had two problems: population growth and population concentration, which were solved by moving to new cities. Rapid urbanization and changing lifestyles have disrupted the ecological structure of cities. This has given rise to the phenomenon of urban heat islands (UHI). This phenomenon is characterized by higher air and surface temperatures in cities than in rural areas. The research into this phenomenon is based on land surface temperatures (LST), which are closely related to land use characteristics (LU). Researchers can now measure LST across wide areas with great temporal and spatial accuracy using remote sensing (RS), Geographical information systems (GIS), and statistical approaches. Google Earth's high-resolution maps also help identify LU classes. All of these assisted in achieving the study's main goal of examining the impact of LU on LST and hence the phenomena of UHI in new cities. The LU diversity was determined using high-resolution Google Earth maps, while the LST was extracted using free RS data. The study concluded that paved and unpaved roads, as well as unoccupied places, absorb considerable amounts of solar radiation, leading to increased heat storage and UHI. The coldest temperatures were reported in residential and green regions.

Keywords:

Urban heat island, Land Use, New Cities in Egypt, Remote sensing, GIS.

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