

## INTISARI

Urbanisasi manusia berpengaruh pada keseimbangan di alam. Meningkatnya pembangunan dan bertambahnya populasi manusia, akan meningkatkan pula kawasan perkotaan. Setiap kawasan kota menghasilkan kubah panas *Urban Heat Island (UHI)* yang akan mempengaruhi iklim mikro, dan kenyamanan *thermal*. Penelitian ini bertujuan : (1) Menganalisis zona persebaran *UHI* di Kapanewon Depok, Kabupaten Sleman, D.I. Yogyakarta. (2) Menganalisis hubungan *UHI*, dengan kerapatan Vegetasi Hijau yang juga mempengaruhi kondisi iklim mikro. (3) Menganalisis hubungan antara *UHI* dengan anasir iklim mikro, *Human Respiratory Rate (HRR)*/Frekuensi Pernafasan Manusia dan juga kenyamanan *thermal*.

Penelitian di lakukan di 3 Zona di 3 Kelurahan dalam satu Kapanewon Depok, Sleman, Yogyakarta, yakni : (1) Zona perempatan Kentungan, Pandegasari, Caturtunggal, (2) Zona perempatan Gejayan, Sawitsari, Condongcatur dan (3) Zona tikungan Ringroad Utara, Karangnongko, Sanggrahan, Maguwoharjo yang memiliki laju urbanisasi tinggi dan dihubungkan oleh Ringroad Utara. Penelitian dilakukan dengan metode Penginderaan Jauh (PJ) memanfaatkan Citra Satelit Landsat-8 (*Band-4,5,10/thermal*) dan dianalisis menggunakan *Software ArcGIS*, kemudian diikuti dengan pengukuran anasir iklim mikro dan kenyamanan *thermal* di lapangan serta dilakukan wawancara terhadap 50 responden kepada 110 warga yang berdomisili di area *UHI* di tiap zona, untuk mengetahui arus kesadaran terhadap *UHI* serta untuk menganalisis dampak *UHI* terhadap kenyamanan hidup warga dengan mengukur indeks skala perpepsi kenyamanan *thermal*.

Hasil analisis citra Landsat-8, terjadi *UHI*, dengan suhu sebesar  $30,85^{\circ}\text{C}$  –  $36,93^{\circ}\text{C}$ , dengan nilai indeks kenyamanan *thermal* 1-2, yaitu Agak Panas sampai Panas. Berdasarkan analisis korelasi-regresi suhu *UHI* memiliki korelasi positif dengan Frekuensi Pernafasan Manusia (*HRR*) yaitu sebesar 0,33 untuk zona perempatan Condongcatur, 0,35 untuk Zona perempatan Kentungan dan 0,54 untuk zona Karangnongko, Maguwoharjo, saat ini masih aman bagi kesehatan. Berdasarkan kuesioner mayoritas warga merasakan “Agak Panas sampai Panas” di semua zona dengan nilai indeks kenyamanan *thermal* 1-2. Hubungan antara *UHI* dengan tutupan lahan alami di lokasi penelitian adalah berbanding terbalik ( $r=0,651$ ). Disimpulkan bahwa ada fenomena *UHI* yang menyebabkan suhu udara dalam cakupan iklim mikro meningkat menjadi Agak Panas ke arah Panas (indeks 1 ke arah 2), namun masih aman bagi kesehatan dan *UHI* dominan di kawasan terbangun. *UHI* berbanding lurus dengan pembangunan, oleh karena itu sebelum melakukan pembangunan diperlukan studi kelayakan, pembiaran dan penambahan ruang-ruang hijau.

**Kata Kunci :** *Urban Heat Island*, Penginderaan jauh, Frekuensi Nafas Manusia (*HRR*), Kenyamanan *Thermal*, *Ruang-ruang Hijau*.

## ABSTRACT

Human urbanization an impact on the balance in nature. Increasing development and human population will also make increase in urban zone. Each urban zone produces Urban Heat Island (UHI) dome that will affect the microclimate, and thermal comfort. This research aims to: (1) Analyze the UHI distribution zone (2) Analyze the relationship between UHI and the density of green vegetation which also influences microclimate conditions. (3) Analyze the relationship between UHI and microclimate factors, Human Respiratory Rate (HRR) and Human thermal comfort. Analyze the relationship between UHI and the density of green vegetation which also influences microclimate conditions.

The research was conducted in District / Kapanewon Depok, Sleman, Yogyakarta, divided in three location namely: (1) Pandhegasari, Kentungan, Caturtunggal, (2) Sawitsari, Gejayan, Condongcatur and (3) Karangnongko, Sanggrahan, Maguwoharjo. All location connected each other by Primary City Road called Ringroad Utara. The research was conducted using the Remote Sensing method utilizing Landsat-8 satellite imagery (Band-4,5,10/thermal) and analyzed using ArcGIS Software and followed by microclimate and thermal comfort factors measurements in the field and conducting interviews with 50 respondent of 110 of residents who live in the UHI area in each Zone, to determine the current awareness of UHI and to analyze the impact of UHI on residents' living comfort by measuring the thermal comfort perception scale index.

The results of the Landsat-8 imagery analysis, UHI occurred, with temperatur of  $30.85^{\circ}\text{C}$  -  $36.93^{\circ}\text{C}$ , with a scale of thermal comfort index value in range of 1-2, Slightly Hot to Hot level based on tropical standard and Slightly Warm to Warm on ASHRAE 55 standard. According to correlation-regression analysis, UHI temperature has a positive correlation with HRR which is 0.33 for Sawitsari, Condongcatur zone, 0.35 for Pandegasari Kentungan, Caturtunggal zone and 0.54 for Karangnongko, Maguwoharjo zone, currently still safe for health. Based on the questionnaire, the majority of residents feel Slightly hot to Hot in their environment of all zones with a thermal comfort index value of 1-2. The relationship between UHI and natural land cover in the study area is inversely proportional, negatify correlated ( $r=0,651$ ). It is concluded that there is a UHI phenomenon that causes temperatur increase that make uncomfot thermal environment with slightly hot until hot condition state (Index scale 1 towards 2), but it is still safe for health and UHI is dominant in built-up areas. UHI is directly proportional to development, therefore before carrying out development, a feasibility study is required, allowing and adding green spaces.

**Keywords** : Urban Heat Island, Remote Sensing, Human Respiratory Rate, Thermal Comfort, Green Spaces.