

TINGKAT KENYAMANAN PADA BERBAGAI TIPE RUANG TERBUKA HIJAU DI KOTA MAGELANG

Adita Dwipuspa¹, Kaharuddin², Ni Putu Diana Mahayani³

INTISARI

Peningkatan jumlah penduduk di Kota Magelang diikuti oleh peningkatan jumlah ruang terbangun, aktivitas industri, dan transportasi, sehingga mempengaruhi suhu udara dan kelembaban relatifnya. Kegiatan penataan tata ruang Kota Magelang untuk Ruang Terbuka Hijau (RTH) yang memiliki fungsi ekologis diperuntukan untuk mengatur suhu udara dan kelembaban relatif agar dapat meningkatkan tingkat kenyamanan kota. Tingkat kenyamanan termal dan kenyamanan pengunjung bermanfaat untuk menentukan efektivitas RTH dalam meningkatkan kualitas lingkungan kota. Penelitian ini bertujuan untuk mengetahui kondisi fisik lingkungan, tingkat kenyamanan termal, dan tingkat kenyamanan berdasarkan persepsi pengunjung RTH di Kota Magelang.

Tiga RTH yang diamati, yaitu Kebun Raya Gunung Tidar, Taman Alun-Alun, dan Taman Badaan. Identifikasi tingkat kenyamanan termal, pengukuran suhu dan kelembaban udara dilakukan dengan alat *thermohygrometer* pada titik-titik pengamatan yang ditentukan berdasarkan teknik *purposive sampling*. Pengukuran penutupan tajuk dengan tabung okuler dilakukan dengan metode *protocol sampling*. Citra Landsat 8 juga digunakan untuk analisis *Normalized Difference Vegetation Index* (NDVI) untuk mengkonfirmasi penutupan tajuk yang diamati. Tingkat kenyamanan berdasarkan persepsi pengunjung diidentifikasi berdasarkan kuesioner yang dibagikan melalui media sosial; dari setiap RTH diambil sampel sejumlah 100 pengunjung, sehingga totalnya adalah 300 responden. Tingkat kenyamanan termal dan pengunjung dikategorikan menjadi tiga kelas, yaitu nyaman, cukup nyaman dan tidak nyaman. Kedua tingkat kenyamanan tersebut kemudian dibandingkan diantara tiga RTH menggunakan uji *one-way ANOVA* atau uji *kruskal-wallis* untuk data non-parametrik. Hubungan antara tingkat kenyamanan termal dan pengunjung dianalisis dengan uji korelasi bivariat.

Hasil penelitian menunjukkan bahwa kondisi fisik rata-rata harian suhu dan kelembaban udara ketiga RTH adalah $28,43 \pm 2,07^{\circ}\text{C}$ dan $69,58 \pm 10,13\%$. RTH Kebun Raya Gunung Tidar memiliki suhu udara lebih rendah dan kelembaban relatif udara lebih tinggi daripada kedua RTH lainnya. Kondisi penutupan tajuk RTH Kebun Raya Gunung Tidar termasuk dalam kategori rapat, sedangkan kedua RTH memiliki penutupan tajuk yang tergolong cukup rapat. Kategori tingkat kenyamanan termal meningkat dengan indeks suhu-kelembaban yang lebih rendah. Tingkat kenyamanan termal di RTH Kebun Raya Gunung Tidar tergolong dalam kategori cukup nyaman, namun di kedua RTH lainnya tergolong tidak nyaman. Persepsi pengunjung terhadap RTH Kebun Raya Gunung Tidar dan Taman Badaan tergolong nyaman, namun di RTH Taman Alun-Alun cukup nyaman. Tingkat kenyamanan pengunjung berkorelasi positif dengan tingkat kenyamanan termal. Tingkat kenyamanan termal dan pengunjung semakin tinggi apabila penutupan tajuk semakin rapat.

Kata kunci: *ruang terbuka hijau, tingkat kenyamanan termal, persepsi pengunjung, penutupan tajuk, iklim mikro*

¹ Mahasiswa pada Departemen Konservasi Sumber Daya Hutan, Fakultas Kehutanan, Universitas Gadjah Mada

² Dosen pada Departemen Konservasi Sumber Daya Hutan, Fakultas Kehutanan, Universitas Gadjah Mada

³ Dosen pada Departemen Konservasi Sumber Daya Hutan, Fakultas Kehutanan, Universitas Gadjah Mada

COMFORT LEVELS AT VARIOUS TYPE OF GREEN OPEN SPACE IN MAGELANG CITY

Adita Dwipuspa¹, Kaharuddin², Ni Putu Diana Mahayani³

ABSTRACT

The amount of built spaces, industrial activities and transportation are linear with the increase of population in Magelang City, affecting its air temperature and relative humidity. The establishment of green open spaces with their ecological functions to regulate air temperature and relative humidity are meant to improve the comfort level of a city. The levels of thermal and visitor comfort determine the effectiveness of green open spaces to improve the environmental quality of a city. This study aimed to identify the physical environment, thermal and visitor comfort of Magelang's green open spaces.

Three green open spaces were observed, i.e., Gunung Tidar Botanical Gardens, Alun-Alun Park, and Badaan Park. To identify thermal comfort, air temperature and relative humidity were measured to estimate the thermal humidity index (THI) at several points determined purposively. Tree canopy closure was measured using an ocular tube based on protocol sampling method. Landsat 8 imageries were also used to measure Normalized Difference Vegetation Index (NDVI) to confirm the proportion of canopy closures of green open spaces observed. The visitor's comfort was identified based on questionnaires that were distributed through social media; one hundred visitors were sampled from each green open space, resulting in 300 respondents in total. The level of thermal and visitor comfort were then categorized into three classes, i.e., comfortable, fairly comfortable, and not comfortable. Both types of comfort levels were compared among three green open spaces using one-way ANOVA for parametric or kruskal-wallis tests for non-parametric alternative to the one-way ANOVA. The relationships between thermal and visitor comfort were analyzed using bivariate correlation.

The results showed that the physical conditions of the average daily temperature and humidity of the three green open spaces were $28.43 \pm 2.07^{\circ}\text{C}$ and $69.58 \pm 10.13\%$. The Gunung Tidar Botanical Garden had a lower air temperature and higher humidity than the other two green open spaces. The canopy closure of the Gunung Tidar Botanical Garden was classified as dense, while for the other two green open spaces were classified as moderately dense. The categories of thermal comfort level based on the temperature humidity index (THI) indicate that the level of thermal comfort increases with a lower temperature-humidity index. The level of thermal comfort in the Gunung Tidar Botanical Gardens was categorized as fairly comfortable, while for the other two green open spaces were categorized as not comfortable. Visitors' perceptions of the Gunung Tidar Botanical Gardens and Taman Alun-alun were categorized as comfortable, but the perception towards Taman Badaan was categorized as fairly comfortable. The comfort level based on visitors' perceptions associated positively with the level of thermal comfort. Both higher thermal comfort and visitor comfort were associated with a denser canopy closure.

Keywords: *green open space, thermal comfort level, visitor perception, canopy closure, microclimate*

¹ Student of Forest Resources Conservation Department, Faculty of Forestry, Universitas Gadjah Mada

² Lecturer of Forest Resources Conservation Department, Faculty of Forestry, Universitas Gadjah Mada

³ Lecturer of Forest Resources Conservation Department, Faculty of Forestry, Universitas Gadjah Mada