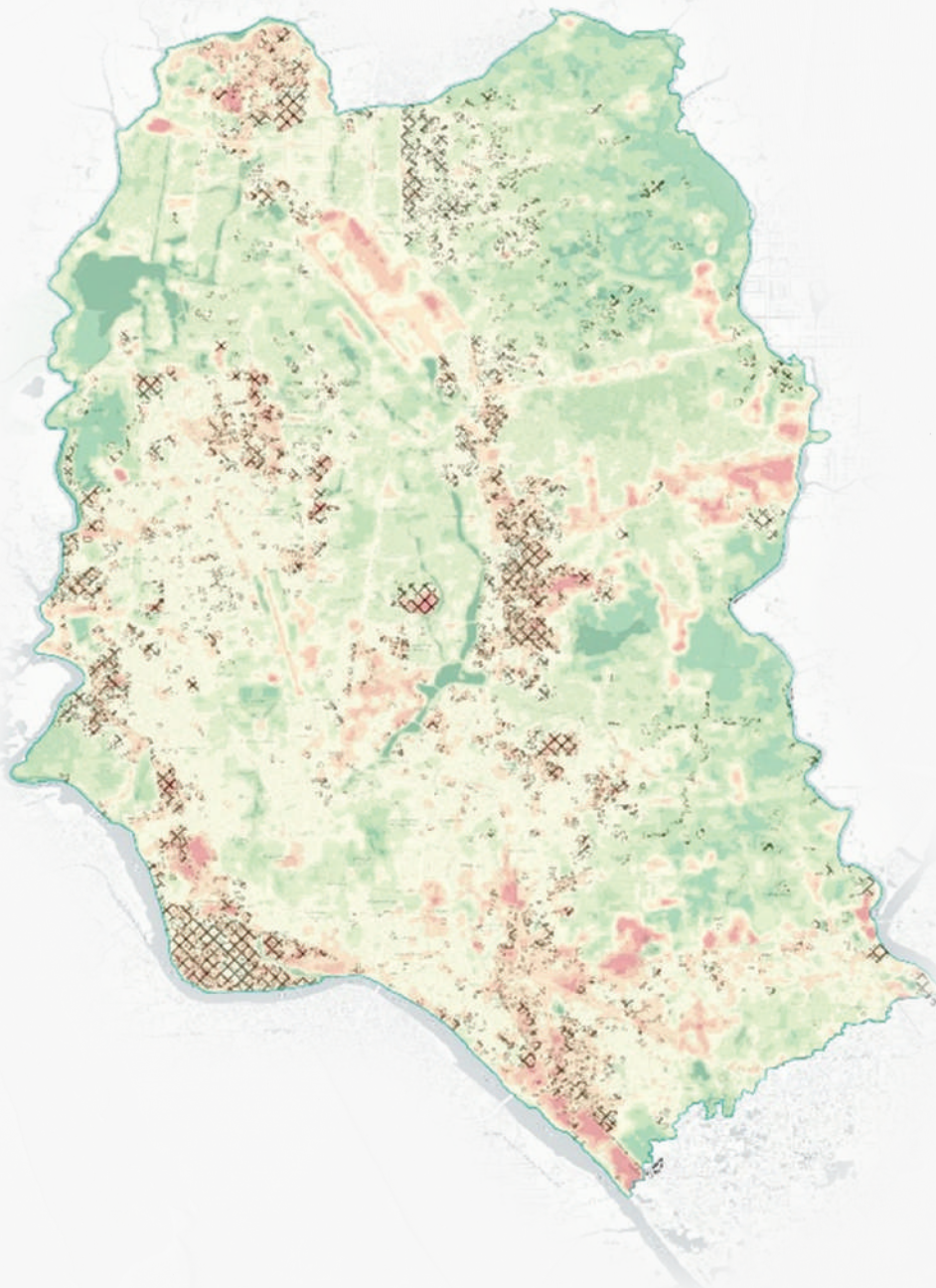


POLICY BRIEF

TACKLING HEAT EXPOSURE IN DHAKA



Dhaka faces multiple challenges, with extreme heat exposure as one of the significant ones. To address this, BRAC James P Grant School of Public Health, BRAC University monitored and analyzed city-wide temperature exposure to bridge knowledge gaps and inform policy action.

A temperature monitoring campaign was held in July-September 2023 where in-situ near surface air temperature (3 to 6 meters above ground) has been measured from 8 fixed (continuous 60 days) and 61 rotating (continuous 72 hours) sites comprising 5 land use categories. The land use categories are:

- Built-up area
- Roadspace area
- Green and Blue space area
- Suburban area
- Industrial area

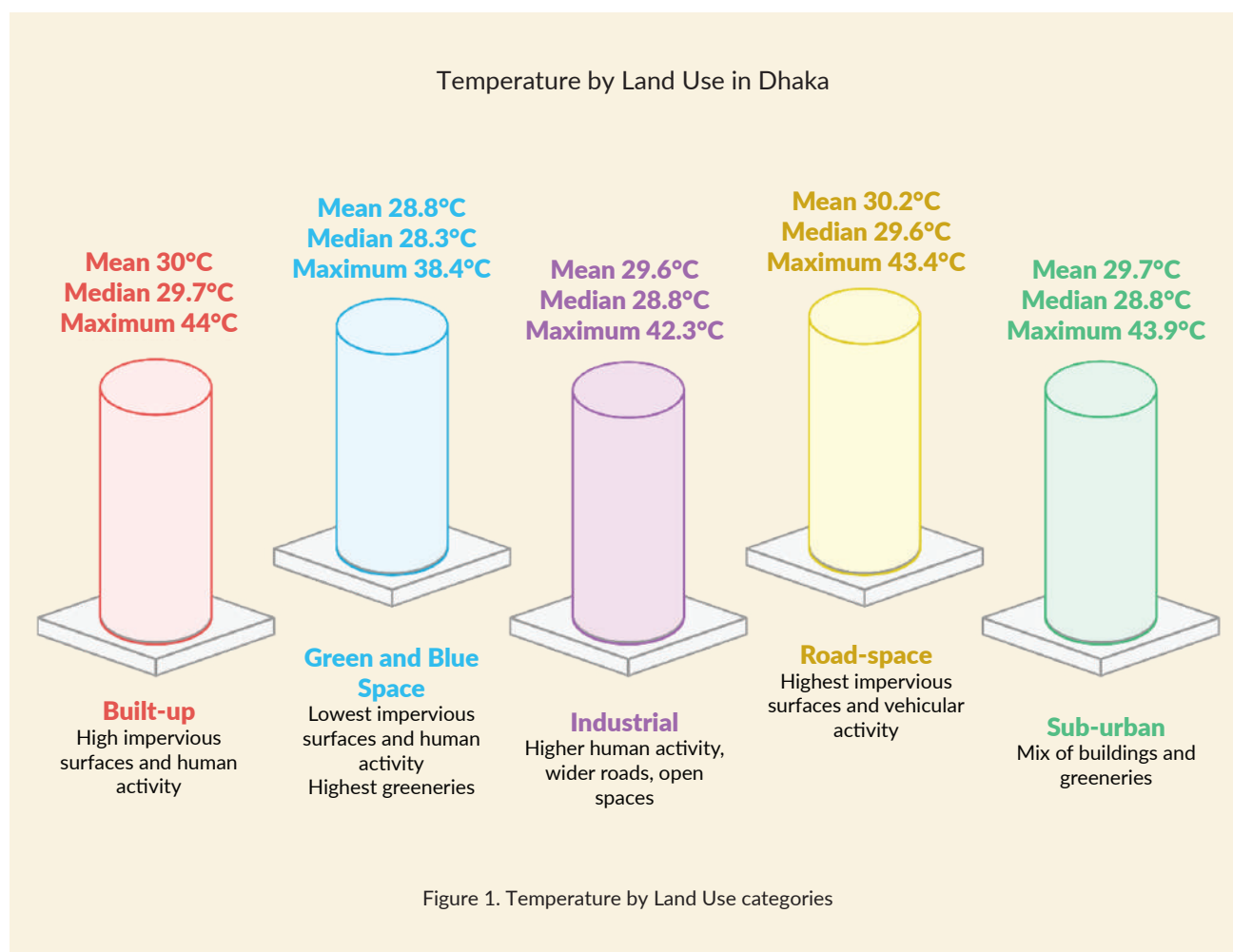
This monitoring data has been used to identify areas with the maximum heat exposure and people

residing or working in these areas has been interviewed through 9 Focus Group Discussions (FGDs). Additionally, 10 Key Informant Interviews (KIIs) were also conducted with relevant stakeholders from government departments/agencies, non-government organizations, and academia. This study is developing a pilot scale heatwave vulnerability index (HVI) with relevant and available secondary data.

Results and Policy Recommendations

Scorching Heat

During the study period, the average temperature recorded by Bangladesh Meteorological Department (BMD) was 29.7°C, closely aligning with this study's average of 29.9°C. But the maximum temperature recorded by BMD was 37.0°C, while field data showed a significantly higher peak of 44.0°C.



Temperature distribution varied across different land use types, as shown in Figure 1. The data shows that Green and Blue space areas of the city stays comparatively cooler, more during heat extremes (e.g. heat waves). To address the scorching heat faced by people of different parts of the city, this study recommends installing networks of monitoring stations for the city.

- ✓ Networks of monitoring stations covering all land use types is necessary for Dhaka. Currently BMD has a single monitoring station at Dhaka, which only captures city-wide averages useful for climate modelling and weather forecasting. Along with BMD, city corporations (local government), RAJUK, health ministry, and organizations working on climate and health, can setup monitoring stations for monitoring, research, planning, and management.
- ✓ A broader network will help to identify heat hotspots, vulnerable communities, and localized drivers of extreme heat.

Partially Burned

Green and blue spaces are 0.8°C to 1.4°C cooler than other areas. In Dhaka, none of these areas are completely linear, rather green and blue features (trees, waterbodies) are dominant with the presence of other land uses.

- If the city can adopt sufficient green and blue spaces, the city temperature can be reduced by approximately 1°C.
- A minimum of 0.5°C can be reduced if sub-urban characteristics, like a mix of greeneries and infrastructures can be adopted.
- ✓ Outdoor temperature in industrial areas are comparatively less hot, probably due to more open spaces, wider roads, and scattered greeneries. The heat condition of these areas can be improved much easily with proper management and policy. The policies should increase the number of open

areas and impervious surfaces in industrial sites, along with ensuring the protection and care of existing and new trees.

Intra-Urban Heat Islands - IUHI (Hottest Neighborhoods of the City)

Four neighborhoods of Dhaka has been identified with the highest heat exposure, both for mean and maximum temperatures. These areas cover diverse land use characteristics and are among the major Central Business Districts (CBDs) of the city.

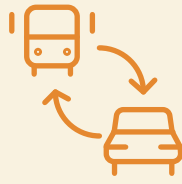
- **Uttara-Airport-Bashundhara:** This is the largest IUHI in the city. Major characteristics of this area include wider roads, airport, and comparatively well-maintained residential areas. The impervious surface area is higher in these neighborhoods.
- **Farmgate:** This is an important transportation junction in the city, having wider roads. The area is characterized by dense traffic, numerous commercial establishments, and limited green cover.
- **Gulistan-Shahbagh:** These areas are also important transportation junctions. The dense urban fabric, coupled with high pedestrian and vehicular traffic, leads to substantial heat retention. In these areas. Although there are several parks in and around these areas, they cannot reduce the heat mostly due to anthropogenic heat generation.
- **Shyampur:** This is an industrial area. This area can be characterized by extensive built-up area with minimal vegetation cover. This is a key entry point for the city, and faces high vehicular movement all the time.
- ✓ IUHI areas need urgent area-specific mitigations. Need comprehensive and separate plans for each IUHI. Respective authorities, including city corporations, Roads and Bridges authority, and ministry of industry can play significant roles for these areas.

Dhaka's Hottest Neighborhoods



Uttara-Airport-Bashundhar

Largest IUHI with wider roads, planned residential areas, and airport. Impervious surface area is higher in these neighborhoods.



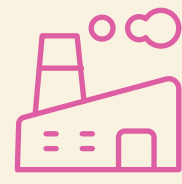
Farmgate-Tejgaon

Important transport junction with dense traffic, government and commercial establishments. The area has limited green cover



Gulistan-Shahbagh

Dense urban fabric with high traffic and human volume. Parks offer limited cooling effect.



Shyampur-Postogola

Industrial area with minimal vegetation cover. Key entry point of the city with high vehicular movement.

Figure 2. IUHIs of Dhaka and their characteristics

The Discrimination

Heat exposure is not uniform across the city, so is the vulnerability. When Informal settlements temperature (LST) is compared to non-informal areas temperature, a significant temperature difference has been observed (Figure 3). People living in informal settlements are exposed to more heat than other areas, 1.4°C precisely.

- Informal settlement areas need assistance during heat waves to combat the heat.
- ✓ Access to clean drinking water, access to medical facilities, and shades for outdoor markets and walkways are inadequate in these areas. City corporations, WASA, LGD, and health ministry need to work together to combat heat for vulnerable population.

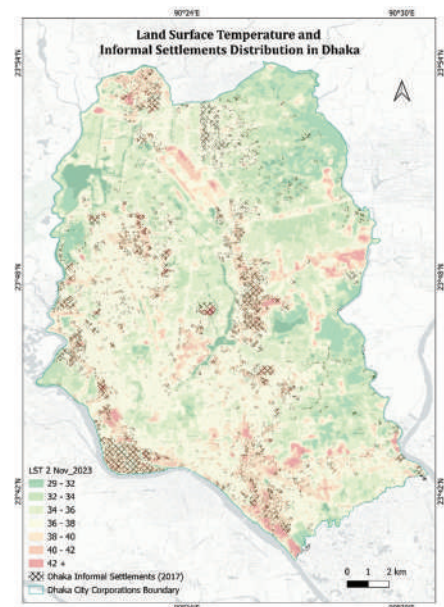


Figure 3. Temperature variability in informal settlements

Health Implications

Due to insufficient data on heat related health problems, direct correlation between exposure to high temperatures and specific health burdens could not be established. Lived experience of the people residing in the heat hotspots of each land use category and interviews with key stakeholders identified some of the health problems that intensifies during heat waves.

- ✓ Heat exhaustion, heat stress, unconsciousness, fever, cold, diarrhea, headache, skin diseases, anger issues, mood swings, and heat strokes are reported as the health burdens.
- ✓ A robust health data collection is a necessity to prioritize health expenditures and combat outbreaks. This robust health data should contain in-detail patient records including precise residence location and geospatial data to analyze for present and future use.

For further information, please contact

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