# INFLUENCE OF PAVED ROADS ON URBAN HEAT ISLAND EFFECT

## - A CASE STUDY IN BATTICALOA DISTRICT

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# ABSTRACT

An Urban Heat Island (UHI) is a city or metropolitan area that is significantly warmer than its surrounding rural areas due to human activities and the main cause of the UHI is the modification of land surface (Ex. Road construction). Problems due to hot weather and UHIs include increased heat mortality, infrastructure failure, increased stress to vegetation, and decreased air and water quality.

This research focused on the surface and air temperature within the canopy layer on different type of roads considering more than 120 roads in Batticaloa district. The statistical analysis such as ANOVA single factor analysis, correlation tests and the t-test two sample assuming unequal variances were used to analyze the effects.

The results of this research reveal that the air temperature difference over different type of pavement has no significance but the difference of surface temperature is significant. The correlation test results have shown good and positive correlations (0.57-0.94) between air and surface temperatures of all kind of road surfaces. The small study on the impact of building density on the pavements has not shown any clear results. Accordingly, the surface temperature difference is only 1° C on asphalt roads and 1.5° C on concrete roads due to the intensity of buildings whereas the impact on of mc adam and unpaved roads is not significant.

However, the results have exhibited that the darker surfaces such as asphalt concrete and mc adam roads contribute more to surface UHI than concrete surface. Accordingly, the average day time surface temperature of concrete surface is approximately 5° C lower than the temperature of dark surfaces. Likewise, the night time surface temperature of concrete surface is approximately 3°C lower than the surface temperature of asphalt concrete surface.