

**ASSESSMENT OF URBANIZATION EFFECTS ON
CLIMATE: A CASE STUDY ISLAMABAD**



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This thesis is submitted to Bahria University, Islamabad in partial
fulfilment of the requirement for the degree of BS in Environmental
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ABSTRACT

This study focuses upon the changing trends in amount of rainfall, humidity and temperature as urbanization occurs in Islamabad. Meteorological data for the years 1997-2017 on these parameters was acquired from Pakistan Meteorological Department, Islamabad. Graphs showing monthly, quarterly and yearly variations were made. Trend lines show the differences that have occurred over the years. Remote Sensing and Geographic Information System were used for assessing the changes in land cover in Islamabad. Data acquired from LANDSAT was used in this study and information about five major classes (built-up, barren land, forest, vegetation and water bodies) was extracted for Islamabad for the years 2000, 2010, 2015 and 2017. Urban development is seen influencing the spatial patterns of Islamabad. With the rapid increase in built-up area, the temperature has decreased while precipitation and humidity have increased by 0.66% and 0.98% respectively. With the lessening vegetation the temperature of the city has increased by 0.3% whereas rainfall has decreased by 0.17%. As the images revealed, water bodies have increased in percentage and so has humidity by 0.89%. Rainfall has also shown a positive relation and maximum temperature displays a negative relation i.e. a decrease in temperature due to the presence of water bodies. It is seen that all classes are differently affecting the climatic factors. If the presence of one class positively affects the climate it may not be the same for the second as well. Small variations are Hence, it is concluded that the techniques of Remote Sensing and Geographic Information System supplemented with meteorological data on climatic factors can prove very efficient and effective for studying the metropolitan growth patterns as well as the change in land cover over a temporal range.

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ABBREVIATIONS

AA	Annual average
ET	Evapo-transpiration
GIS	Geographic Information System
ICT	Islamabad Capital Territory
LULC	Land Use Land Cover
MT	Maximum temperature
PMD	Pakistan Meteorological Department
RS	Remote Sensing
TM	Thematic Mapper
UHI	Urban heat island
USGS	United States geographical survey

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