UNDERSTANDING AND MITIGATING

THE URBAN CANYON EFFECT

SHATABDI
DASH

Introduction

- The Cities have experienced rapid urbanisation which has brought more clusters of tall buildings, compact urban space and the smaller street geometry in the cities .
- The “Canyon” effect takes place when taller buildings are adjoining with narrower streets that results in poor wind flow, higher temperature and deteriorated air quality .
- Because of anthropogenic activities, cities are undergoing a number of environmental problems; one among them is urban overheating caused by Urban Canyon Effect.
- An important reason for canyon effect is changing morphology of the city with high density developments which absorbs a lot of solar radiation and alters the air flow.
- The developments or urban forms of a city are the result of combination of building arrangements, building’s height, their distances among themselves, and their built space.
- Loss of vegetation, destruction of water bodies and increase in paved area negatively impacts thermal and radiative properties of surface making cities hotter than surrounding non-urban areas.

Problem Statement/Opportunity:

The Cities have experienced rapid urbanization which has brought more clusters of tall buildings, compact urban space and the smaller street geometry in the cities. The “Canyon” effect takes place when taller buildings are adjoining with narrower streets that result in poor wind flow, higher temperature and deteriorated air quality. An important reason for canyon effect is changing morphology of the city with high density developments which absorbs a lot of solar radiation and alters the air flow. Loss of vegetation, destruction of water bodies and increase in paved area negatively impacts thermal and radiative properties of surface making cities hotter than surrounding non-urban areas. With heavily built-up areas and concrete structures. Which leads to urban heat island effect and significantly contributes to global Warming.

Project Description:

Project Description: The core idea of the project is to mitigate and reduce carbon output and Thermal Discomfort. To study the effects of building geometry on radiation, temperature and flow characteristics. To study the temperature change, light levels, wind pattern, air quality and diminished mental health outcomes. Mitigation and adaptation options to ensure sustainability keeping in view the future priorities and rapid transition to limit the effects of global warming. Energy efficient buildings, Green buildings can contribute in reducing the effect. Using of renewable resources for various purpose in buildings can also add to this like using solar panel, rainwater harvesting, rooftop gardens, and green walls etc. Resources are finite so they need to be used judiciously. Microsoft azure IoT solutions can be used to keep in record the use of renewable energy

PROJECT SOLUTION

The Demand for transparency in sustainable development has grown over the years.
Canyon effect can significantly influence **lack of natural ventilation, high thermal discomfort, high street level temperature, hot urban microclimates and detoriated mental condition.**

These problems can be reduced to some extent by:

GREEN BUILDING

Green buildings significantly reduce this effect and helps in providing natural ventilation, helps in maintaining temperature across the building.

ENERGY EFFICIENT BUILDINGS

Keeping in a track record how efficiently the energy are used

RENEWABLE SOURCES OF ENERGY

INTELLIGENT BUILDING SYSTEM

A smart building involves the installation and use of advanced and integrated building technology systems

SUSTAINABILITY CALCULATOR

Microsoft Azure services can be used to built a sustainability calculator.

CARBON OUTPUT

Keeping a record the carbon released from various appliances in a building. Ad significantly reducing the daily carbon output.

Thank you!

Have a great day ahead.