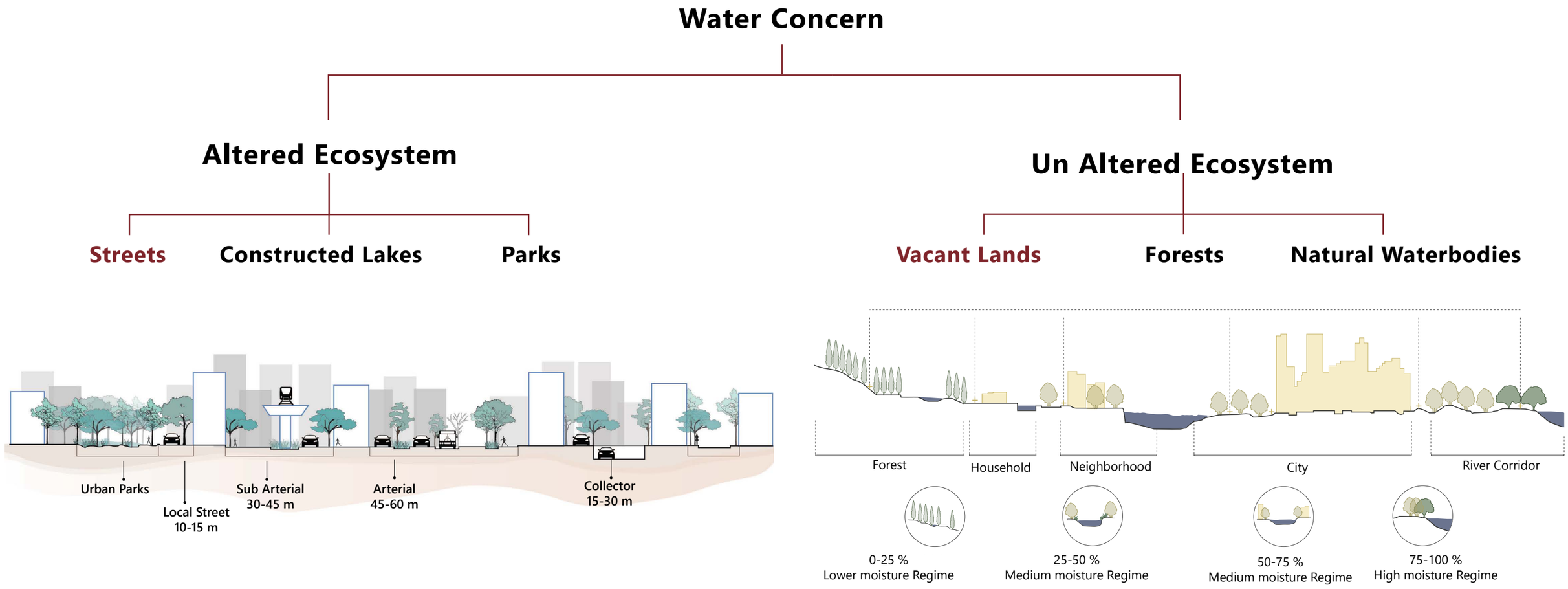
Nature-based Solutions : Addressing Urban Water Stress through Altered and Un-Altered Ecosystems

Scan for full paper

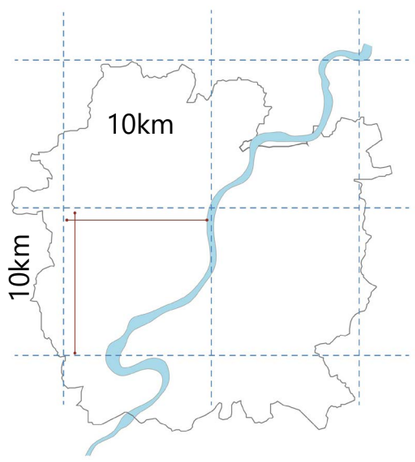
1. Identify

Investigating the primary concerns leading to water stress and urban flooding in a semi-arid land. After identifying the concern, the intensity of the problem in the context is assessed based on the criticality of addressing an ecosystem-based approach typologically classified as actionable outcomes to protect, restore, and create.



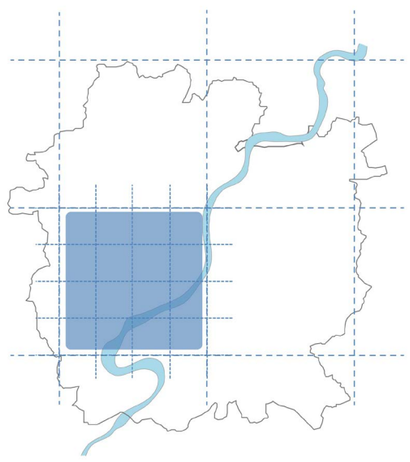
2. Analyze & Adapt

The analytical process begins with providing a systemic weightage through a complex overlay studied under various context, society, and ecology lenses. Depending on its criticality, simulations of various outcomes were developed. The value matrix allows multi-dimensional inferences for integrating the NbS in a given site. Since the NbS must respond to several scenarios with varying combinations of parameters, the outcome is highly flexible and resilient.



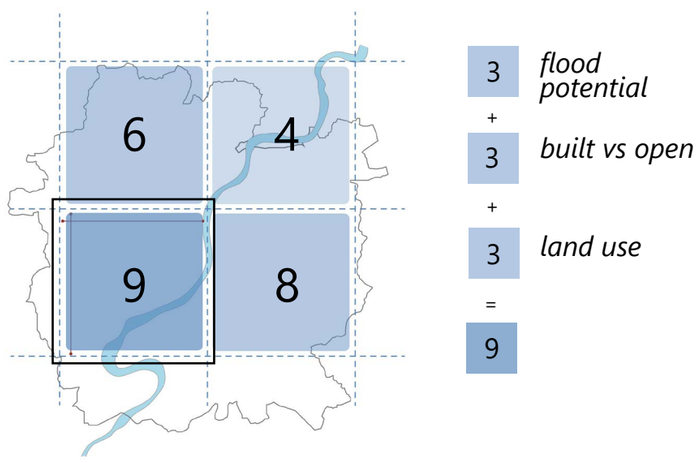
A

Dividing the City through 10km x 10km grid



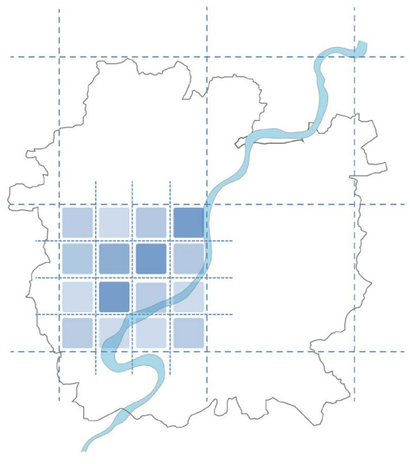
C

Taking the highest value tile and further diving the 10km x 10km tile into 2.5 x 2.5 km tile to get a more granular data.



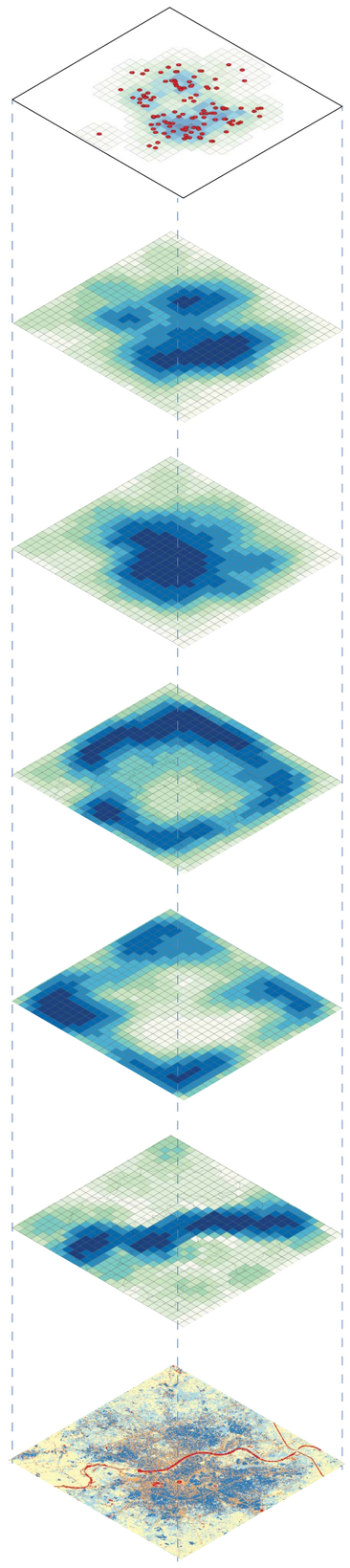
B

Shading each tile using flood potential map, land use through a Development control map and built vs open through a Google Earth grain on seperate maps and then superimposing all three of them to get the most critical tile.



D

Further shading of the divided tile using the same three criteria to get 16 typologies. The darkest being the most critical tile and the lightest being the least.



Flood Risk Potential Points (Point density grid)

Built Density (Image classified raster value grid)

Roads and Impervious Surfaces (Image classified raster value grid)

Vegetation and Farmlands (Image classified raster value grid)

Vacant Lands (Image classified raster value grid)

Water Bodies (Image classified raster value grid)

Merged Class of Ahmedabad (Image classified raster value grid)

Research conducted under the guidance of Sandip Patil and Chandrani Chakrabarti at CEPT University