

Spatial–Ecological Assessment of Flood Vulnerability and Landscape Connectivity in the Bandung Basin

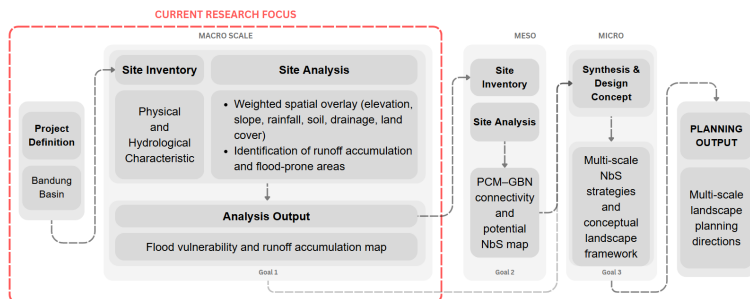
Authors: Abdurrahman Aziz Sofyan*, Medria Shekar Rani*

* School of Architecture, Planning, and Policy Development, Bandung Institute of Technology

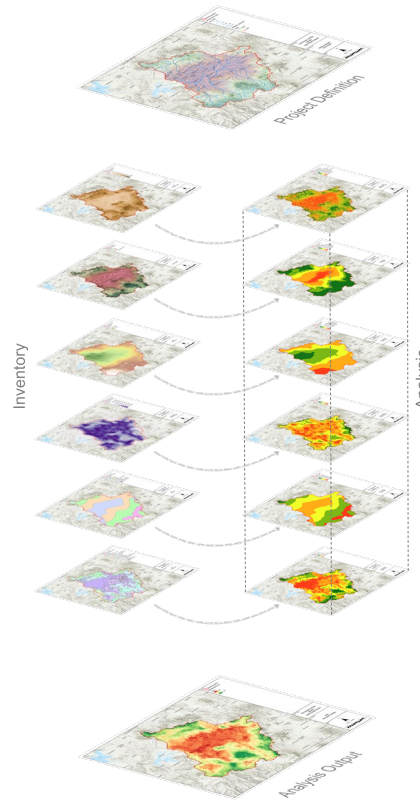
The Bandung Basin, an enclosed volcanic depression in West Java, frequently experiences floods in areas such as Gedebage, Bojongsoang, Dayeuhkolot, Rancasari, and Baleendah. These recurring events raise the question of why flooding remains concentrated in these urban zones despite drainage infrastructure. The basin's low-lying morphology and past wetland conversion may have reduced its natural capacity to retain and absorb water.



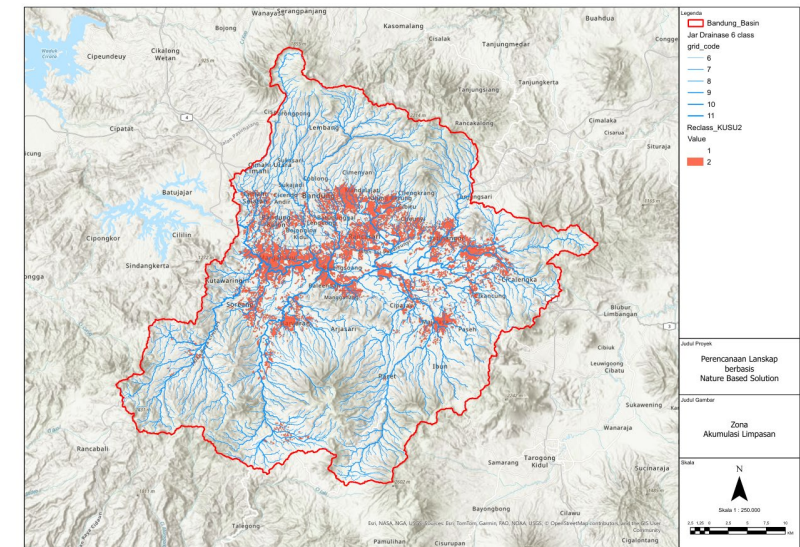
Urban Flood Conditions in the Bandung Basin During the Rainy Season



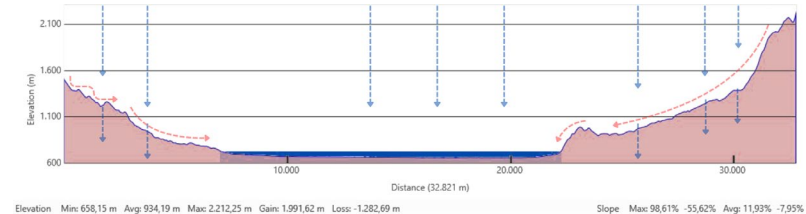
Framework of multi-scale analysis. The red box indicates the phase presented in this poster



Site inventory and weighted overlay process producing the runoff accumulation map, produced using ArcGIS



Runoff Accumulation Zone, produced and visualized using ArcGIS



Cross-Sectional Elevation Profile Showing the Enclosed Morphology of the Bandung Basin, produced and visualized using ArcGIS

A spatial–ecological assessment was conducted using six parameters, including elevation, slope, rainfall, soil type, drainage density, and land cover. The weighted overlay analysis shows that flood-prone zones are distributed across built-up districts such as Margahayu, Bojongsoang, Dayeuhkolot, Baleendah, Rancasari, and Gedebage. The most severe inundations occur in the eastern, southern, and western lowlands, particularly along the Citarum River corridor, where elevation is lowest and urban development has replaced the basin's former wetlands, thereby weakening its hydrological connectivity and disrupting natural water regulation.