

## SUMMARY

This research project forms part of a comprehensive study on the development of a Smart Water Management System for the Start-up Area of the Guangzhou International Financial City (GIFC). The study focuses on understanding existing environmental, hydrological, and urban conditions within the Central Business District (CBD) and proposes integrated water management strategies to address flooding risks, climate resilience, and sustainable urban development.

The CBD area is characterized by dense urbanization, extensive impervious surfaces, and its proximity to the Pearl River. These conditions, combined with seasonal heavy rainfall and typhoon events, have resulted in recurring flood risks, surface water accumulation, and pressure on conventional drainage systems. In addition, high river water levels during extreme events reduce discharge capacity, further increasing the vulnerability of the area.

The research begins with an analysis of the existing situation, including topography, land use, soil conditions, river dynamics, and urban infrastructure. Particular attention is given to elevation differences within the district, stormwater flow paths, and the interaction between urban runoff and the Pearl River system. Field observations and secondary data sources are used to identify key problem areas related to flood risk, water management inefficiencies, and limited adaptive capacity of the current system.

A central component of the proposed concept is the introduction of a wadi system within the CBD, designed to function as a surface-based stormwater regulation corridor. The wadi is strategically located to intercept runoff from surrounding urban blocks, temporarily store excess water during peak rainfall events, and reduce discharge pressure on downstream drainage and river systems.

In addition to flood mitigation, the proposed system contributes to urban microclimate improvement, spatial quality enhancement, and ecological benefits. The research does not focus solely on technical performance but also considers urban integration, land-use compatibility, and long-term resilience of the CBD.

The outcomes of this research provide a conceptual framework for integrated flood risk management in high-density urban areas. The proposed strategy demonstrates how engineered and nature-based solutions can be combined to improve water safety, environmental quality, and sustainability within the Guangzhou CBD. Further development and detailed design recommendations are intended to support future implementation and decision-making processes.

Keywords (kata kunci): wadi, stormwater management, urban drainage, runoff, storage-based system, perforated underdrain, Guangzhou International Financial City.