Building Resilience from Crisis: The Role of Adaptive Infrastructure Investments in Urban Water Management

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Abstract

This paper examines the relationship between cities experiencing water crises and their likelihood of investing in adaptive and green infrastructure to enhance resilience against future water-related shocks. Grounded in resilience theory, the study explores how past disturbances, such as floods, droughts, and contamination events, may act as catalysts for cities to prioritise adaptive infrastructure measures that support long-term resilience. The research employs a multiple case study methodology focused on large Polish cities with populations over 300,000. Historical investment data from the Polish Central Statistical Office and local policy documents were analysed to assess infrastructure investments in green solutions, such as permeable pavements, rain gardens, and wetland restorations, which mitigate flood risks and promote sustainable water management.

Findings suggest that cities with a history of significant water crises are more inclined to invest in adaptive measures. While full quantitative results are pending, initial insights indicate a trend towards integrating green infrastructure, especially in flood-prone areas, as an effective strategy for enhancing urban resilience.

This study contributes to the growing field of urban resilience by highlighting how crisis experience influences infrastructure investment priorities. The results support resilience-based urban policy approaches that balance grey infrastructure with sustainable, green alternatives to create more adaptable urban environments capable of withstanding future climate-related events.

Keywords: resilience, water crises, urban, infrastructure