

Table S1. Stormwater Management Objective Comparison between Sustainable Development Goals (SDGs), International Water Association (IWA) Principles for Water Wise Cities (WWC), Australia Water Sensitive Cities (WSC), Singapore Active, Beautiful, Clean (ABC) Water and China Sponge City Construction (SCC)

Objective classification	Specific objective	SDGs (2030)	IWA Principles for WWC	Australia WSC	Singapore ABC Water program	China SCC
Stormwater system	Surface water control	√	√	√	√	√
	System performance	√	√	√	√	√
	Economic sustainability	√	√	√		
	Technical Innovation	√	√	√	√	
Integrated management	Environmental governance	√	√	√	√	√
	Disaster resistance	√	√	√	√	√
	Resource efficiency	√	√	√	√	√
Social engagement	Public participation	√	√	√	√	
	Scientific governance	√	√	√		
Urban development	Urban space quality improvement	√	√	√	√	√
	Public infrastructure renewal	√	√	√		
	City resilience enhancement	√	√	√	√	√

Supplementary Table S2. Decision Support Tools Comparison under Comprehensive Evaluation Framework for Sustainable Stormwater Management

Objective classification	Specific objectives	Indicators	SWMM	SUSTAIN	MIKE URBAN	Infoworks	MUSIC	DAnCE4 Water	Urban BEATS	CALVIN
Stormwater system	Surface runoff control	Runoff quantity control	√	√	√	√	√	√	√	√
		Non-point source pollution control	√	√		√	√	√	√	
	System performance	Meet design objectives	√	√	√	√	√	√	√	√
		Operational reliability	√	√	√	√	√	√	√	√
		Space requirement							√	
		Site adaptability		√					√	
		System flexibility	√	√	√	√	√	√	√	
		System complexity		√	√	√	√			
		System accessibility and security								
		Suitable system layout/structure								
		Conformity to technical specifications and standard construction					√			
	Economic sustainability	System maintainability								
		Self-sufficiency						√	√	
		Capital cost		√			√	√	√	√
		Operation and maintenance cost		√			√	√	√	√
	Technical innovation	System operation intelligence								

Urban development	Scientific governance	Organize and carry out community activities		
		Information transparency	√	√
		Water-related business opportunity (industrialization)		
		Assessment of professional capacities.		
		Inter-disciplinary, inter-agency cooperation		
		Participation of stakeholders and policy makers.	√	√
		Assessment of leadership capability		
		Multi-sectoral benefits		
	Urban space quality improvement	City livability and landscape improvement		
		Consider water as a major factor of urban planning and design		
		Activate blue- green space		

	Increase vegetation coverage.							
	Improve city aesthetics							
	Increase recreational space							
	Increase property values							
Public infrastructure renewal	Construction of multifunctional water-related infrastructure							
	Accessibility and affordability of water-related public facilities							
City resilience enhancement	Adaptability to extreme weather	√		√	√		√	√
	Urban heat island effect mitigation						√	

SWMM - Storm Water Management Model, SUSTAIN - System for Urban Stormwater Treatment and Analysis Integration, MUSIC - Model for Urban Stormwater Improvement Conceptualization, DAnCE4Water - Dynamic Adaption for eNabling City Evolution for Water, UrbanBEATS - Urban Biophysical Environments And Technologies Simulator.