A Review of LID (Sponge City) Development in China

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Background

Urban flooding

Adapted from ("What Is Urban Flooding?", 2021)

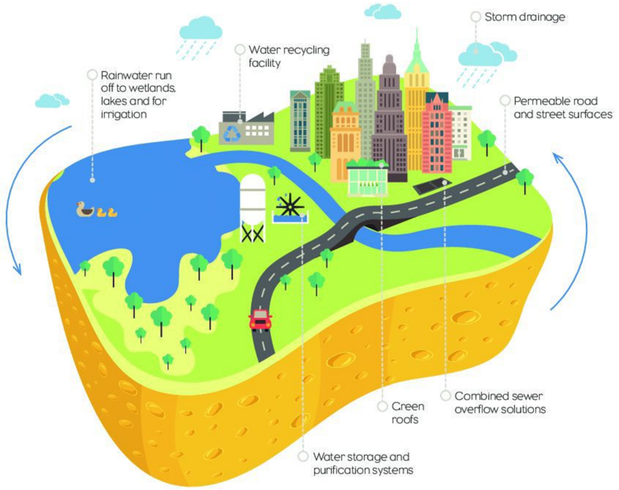
Degraded water quality

Adapted from ("Arup and the British companies creating China's 'sponge cities' | Focus - China Britain Business Council", 2021)

Current Challenges

1. Management chaos
2. Optimization of design and planning
3. Investment Financing
4. Limited monitoring data
5. Government policies

Key Method



Adapted from ("Arup and the British companies creating China's 'sponge cities' | Focus - China Britain Business Council", 2021)

Conclusions

LID performs well in flood volume reduction and water quality improvement.

Suggestions:

1) more attention should be paid to local residents' needs
2) a more friendly policy should be proposed.
3) life-cost cycle assessment should be integrated with the optimization process.

Performance in China

Table 1: Water quality treatment performance of various LID practices

source	LID	TSS (%)	BOD_5 (%)	TP (%)	NH3-N (%)	SS (%)	COD (%)	TN (%)	NO3-N (%)	Zn (%)	Cu (%)	Cd (%)
Zhang et al. (2009)	pond/wetland	70~90	20~50	30~70	30~70	/	/	/	/	/	/	/
	swale	50~90	30~55	25~70	-10~35	/	/	/	/	/	/	/
	planter box/biobox	70~90	20~50	30~70	30~70	/	/	/	/	/	/	/
Jiang et al. (2017)	rain garden	/	/	56.99	59.73	51.79	39.80	56.84	49.84	/	/	/
	swale	/	/	69.80	74.27	82.19	75.11	69.02	73.56	/	/	/
Jia et al. (2015)	bioretention	-10.75	/	-21.26	51.10	/	17.93	48.61	/	100.00	69.45	/
	bioretention+swale	34.85	/	95.26	73.48	/	18.52	74.00	/	/	/	/
Huang et al. (2015)	grass swale	81.55	/	68.90	58.10	/	64.35	56.05	36.85	74.55	/	77.80
Fu and Li (2017)	grass swlae	85.50	/	79.60	70.70	/	76.50	/	28.80	/	/	/
	permeable pavements	83.30	/	74.30	56.20	/	48.30	/	14.30	/	/	/
	bioretention	85.10	/	84.50	79.40	/	80.40	/	28.20	/	/	/

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