

The 1st Conference on
Landscape Recovery and Rehabilitation, Kosice, Slovakia

INITIATIVE

Rain Cities in South Korea

March, 21, 2019

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World Water Problems

Flood



Dry Stream

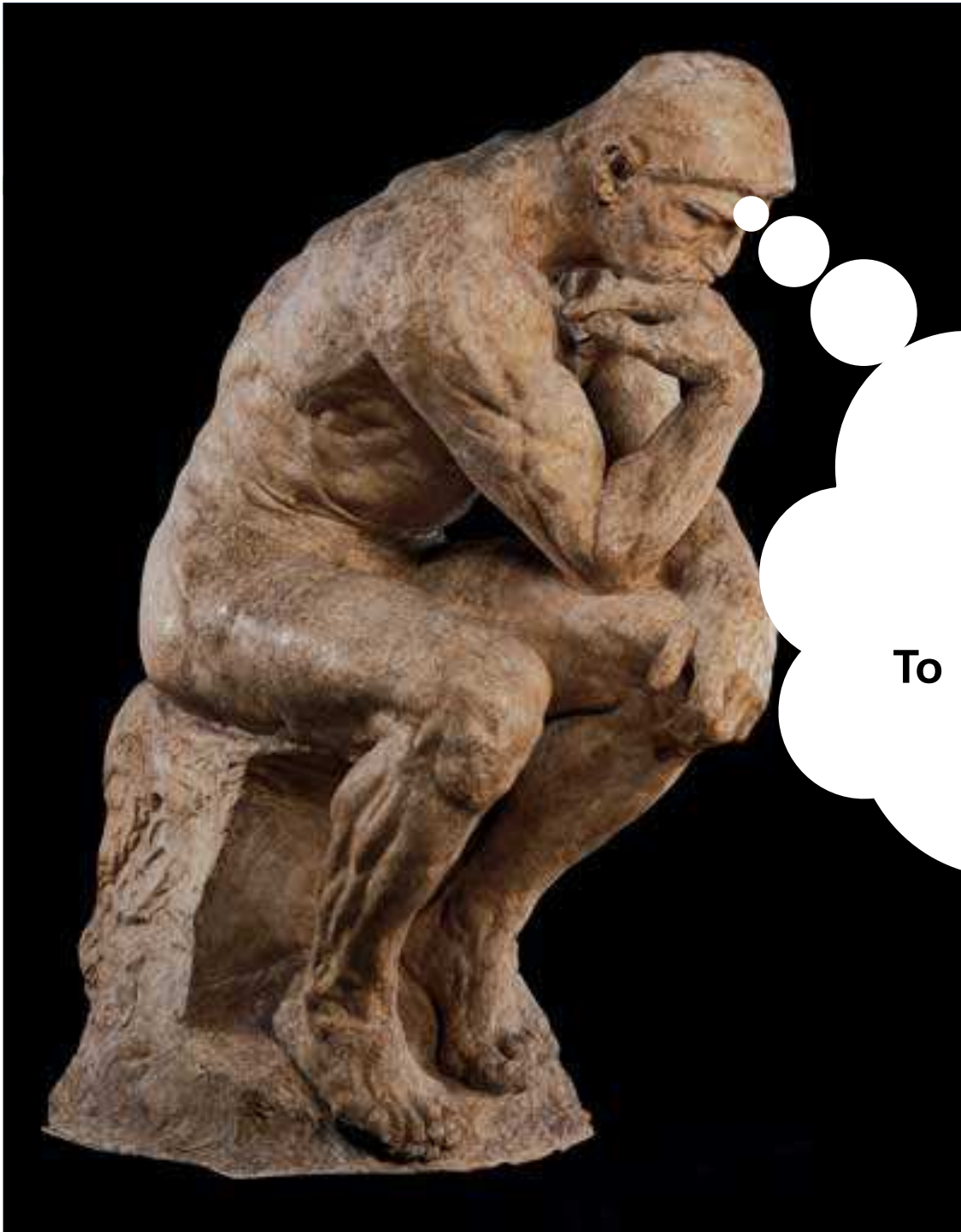


Failure of Water Supply



Heat Island





Rainwater !

To Drain? Or To Collect?



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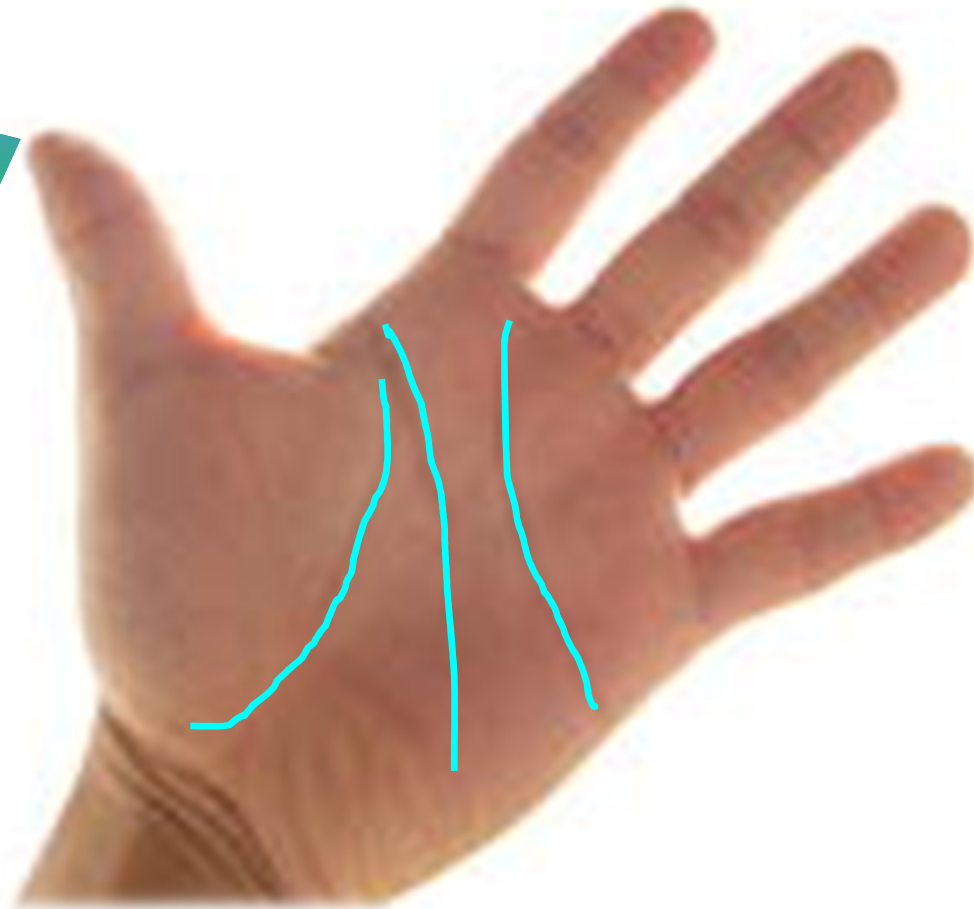
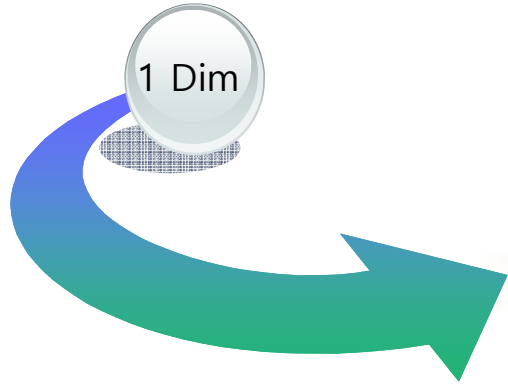
1

Philosophy of Water Management

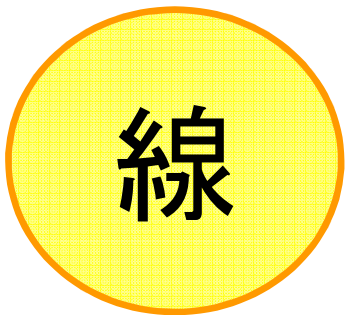


1 dimension

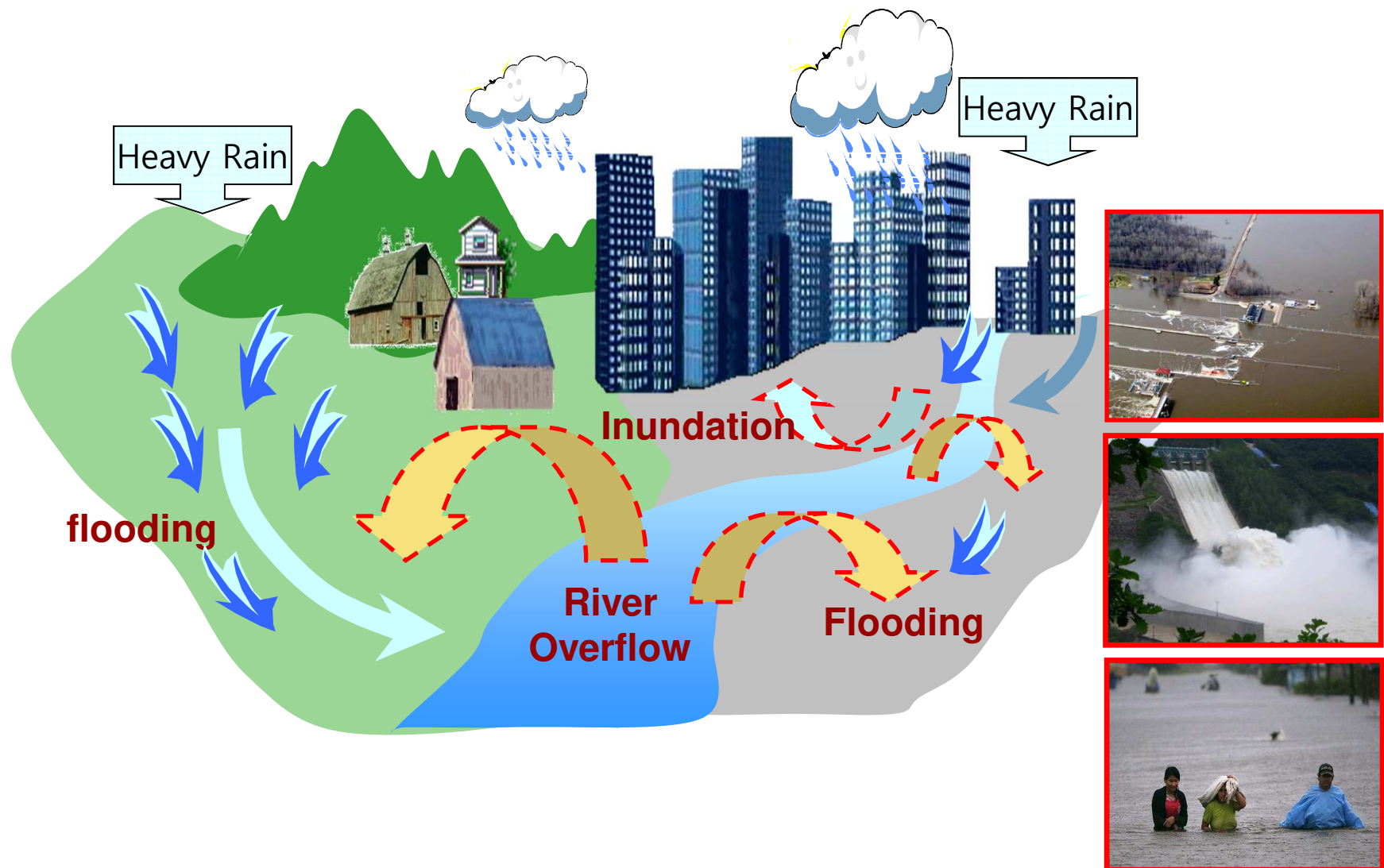
1 Dim



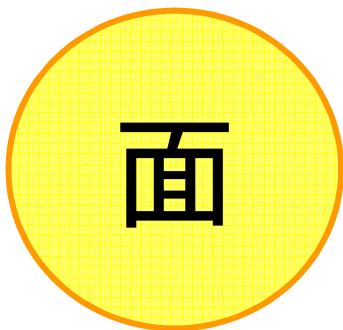
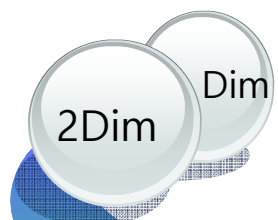
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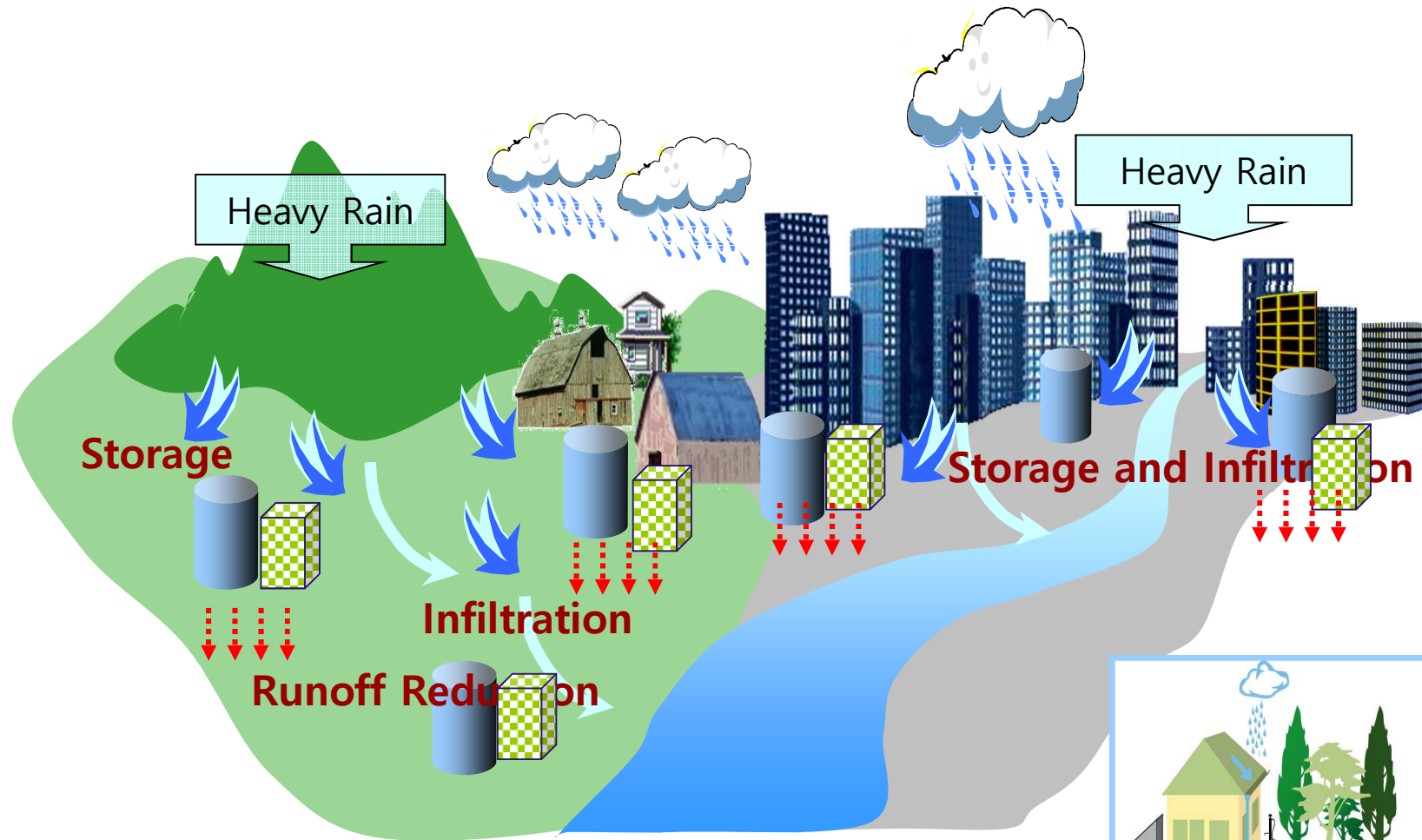
1 dimensional Water Management



2 dimension



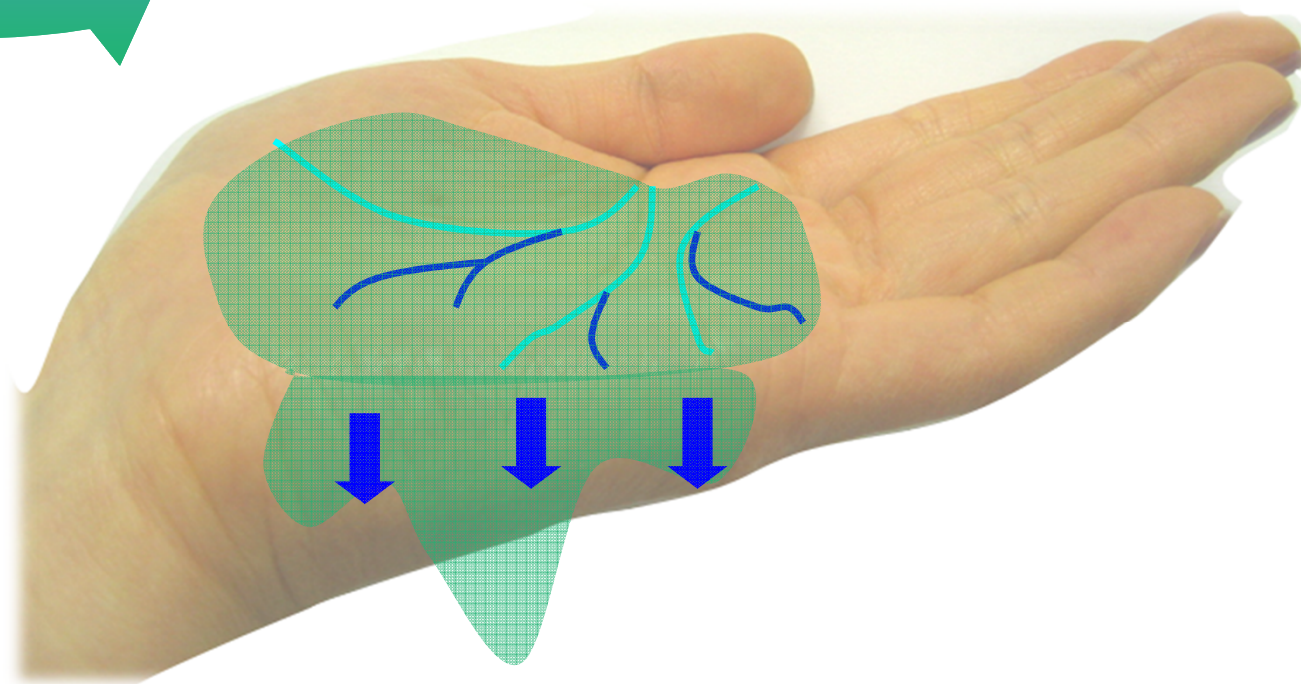
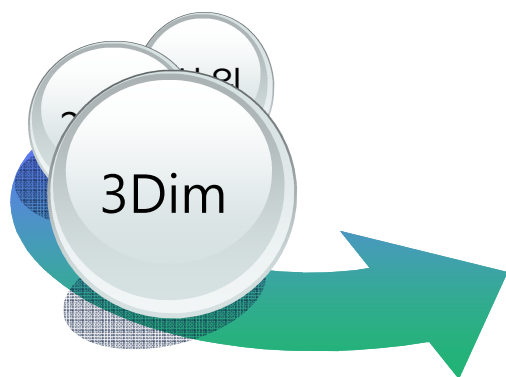
2 dimensional Water Management



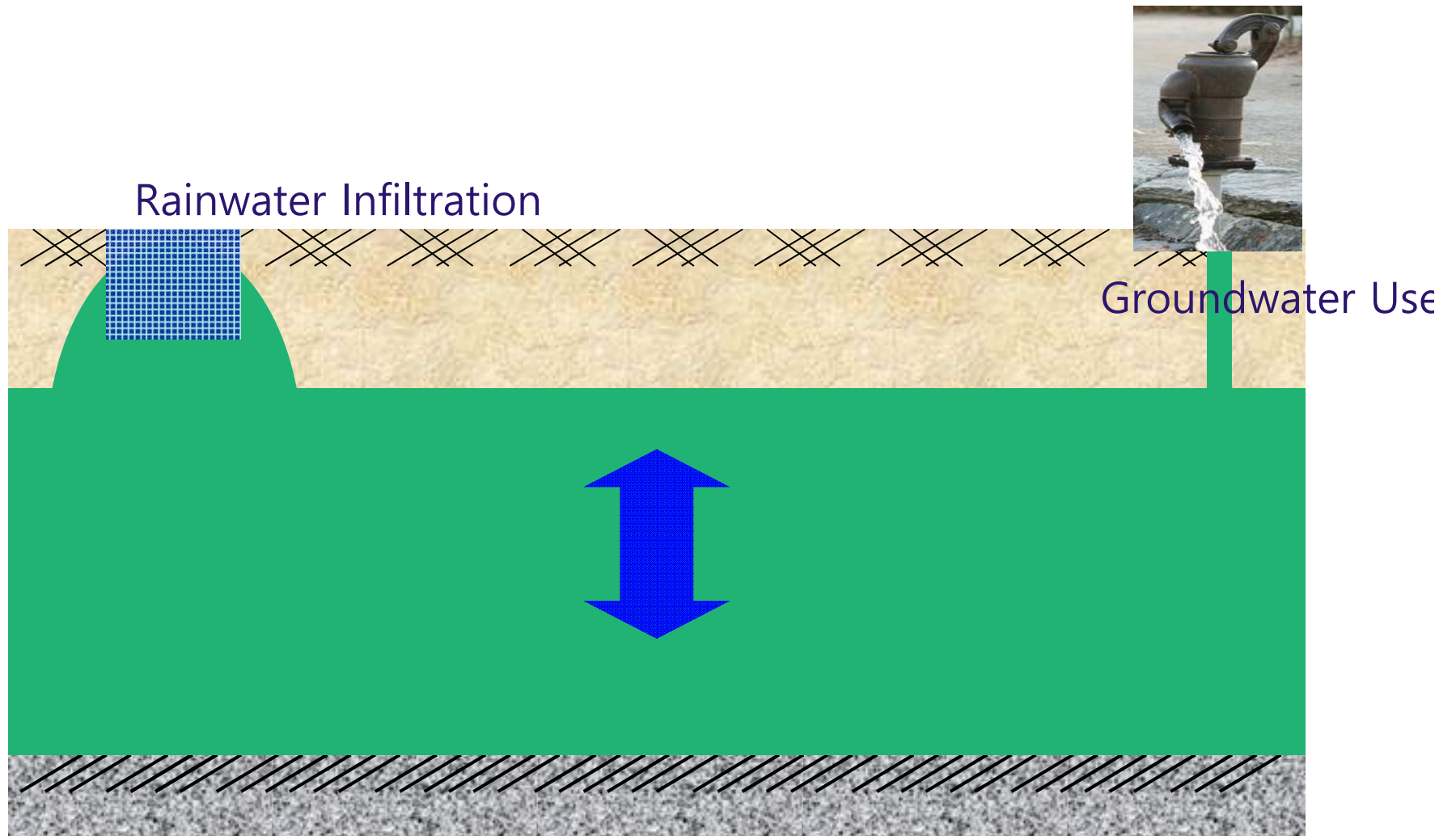
For others and for me



3 dimension

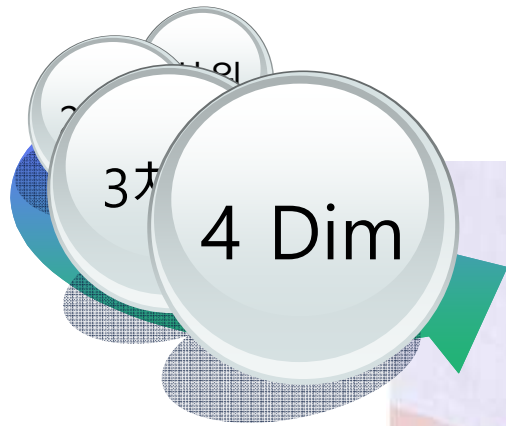


3 dimensional Water Management



For the environment

4 dimension



4 dimensional Water Management



“For next generation ...”



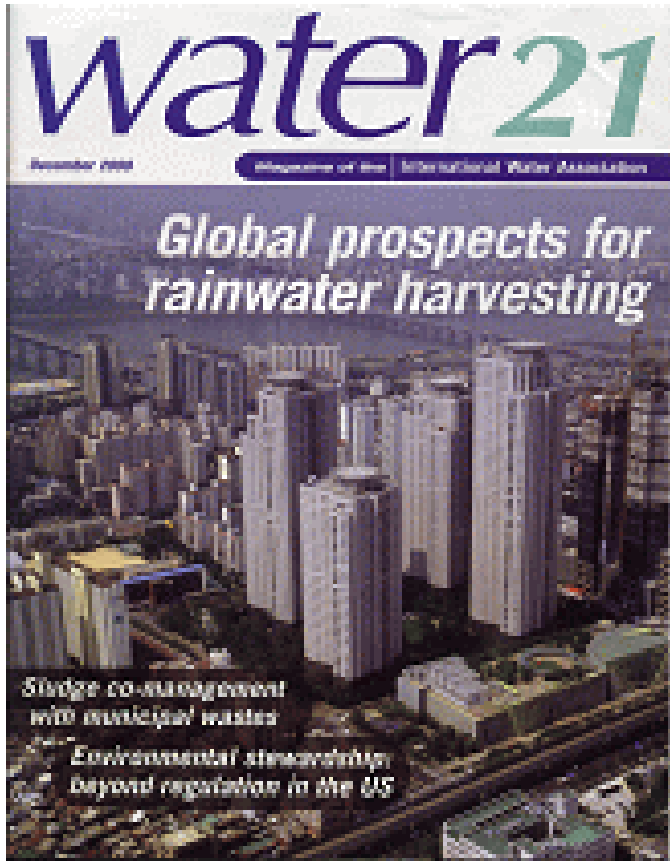
Star City Rainwater Management

Seoul, Korea



Star City Rainwater management

Cover Story of Water 21
(12. 2008. IWA)



주변현황도



조감도





Star City Rainwater management

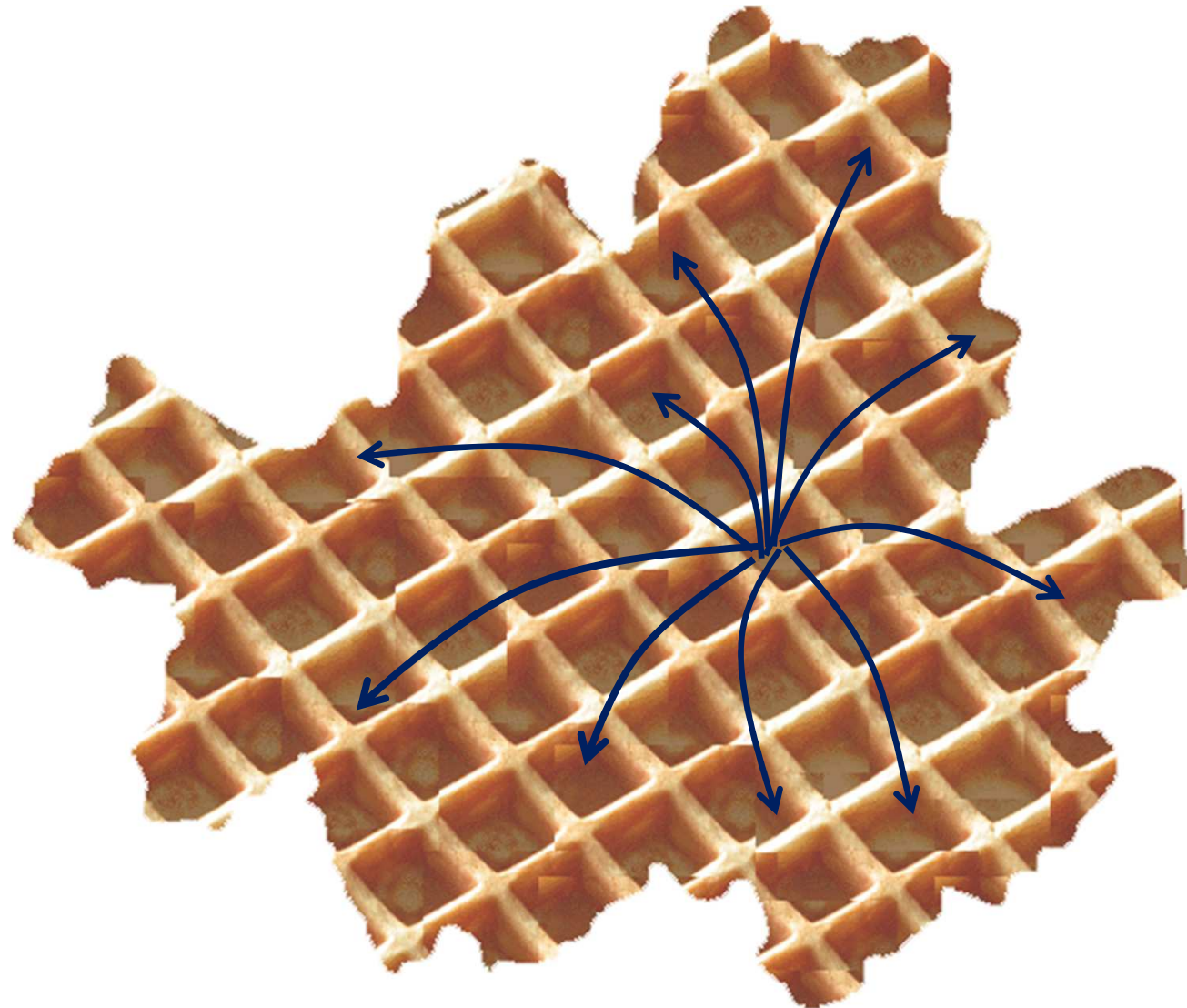
Location	Jayang-dong
	Seoul
	505.2M ²
	7.729M ²
	Officetel, Cultural

For Flood Control

Everybody is happy

弘益人間

Waffle Type Water Management





Promote Rain Cities



**Start from
Rain Building, Rain School, Rain Village!**

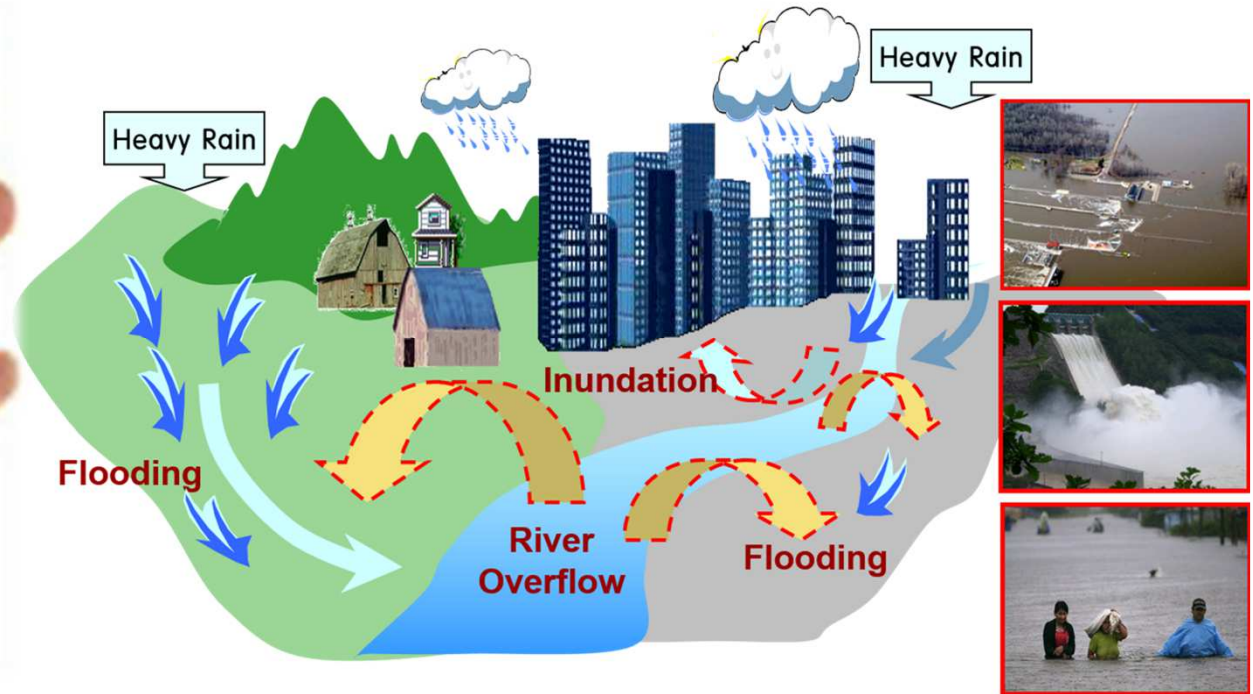
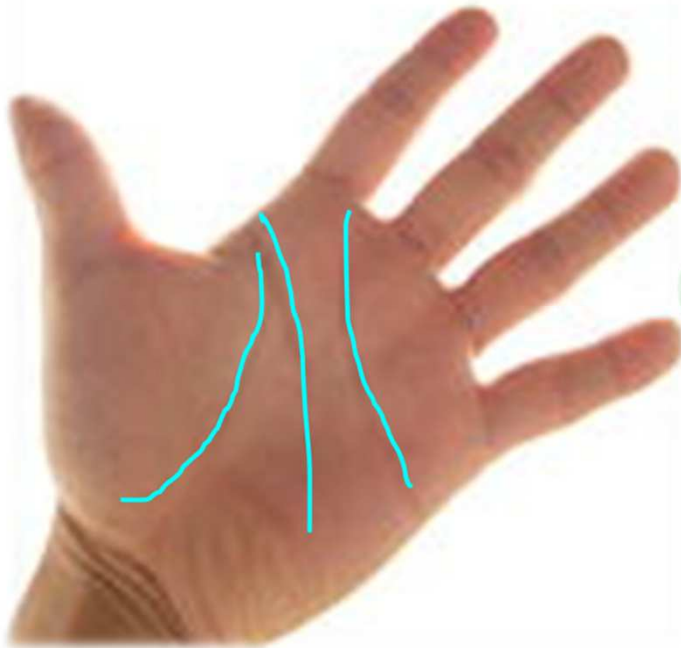
2012 Project Innovation Award from IWA



Rainwater Revolution:

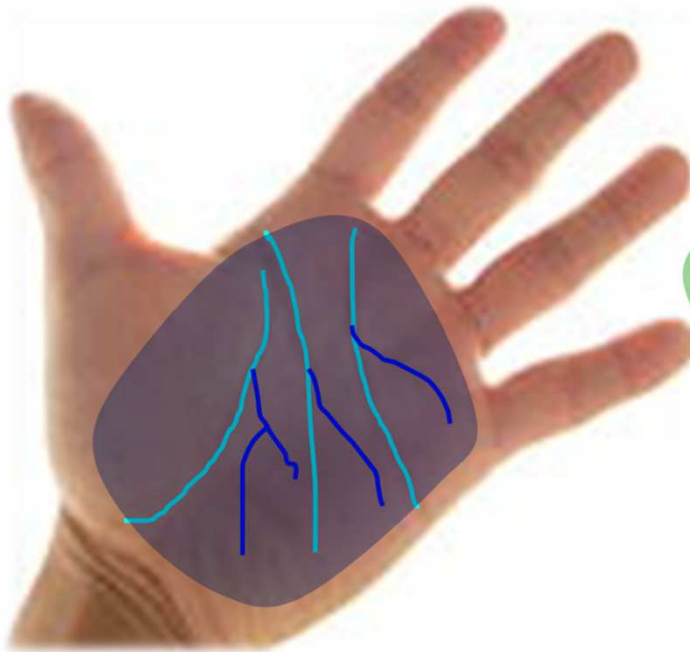
From Drain City to Rain City by Training Brain Citizens!

Old paradigm



- 1) *Rain is a waste*
- 2) *Unite the rain flow and make it strong*
- 3) *Collect rain downstream at a large scale*
- 4) *Do it for a single purpose*
- 5) *Social responsibility of rainwater management: No*

New paradigm

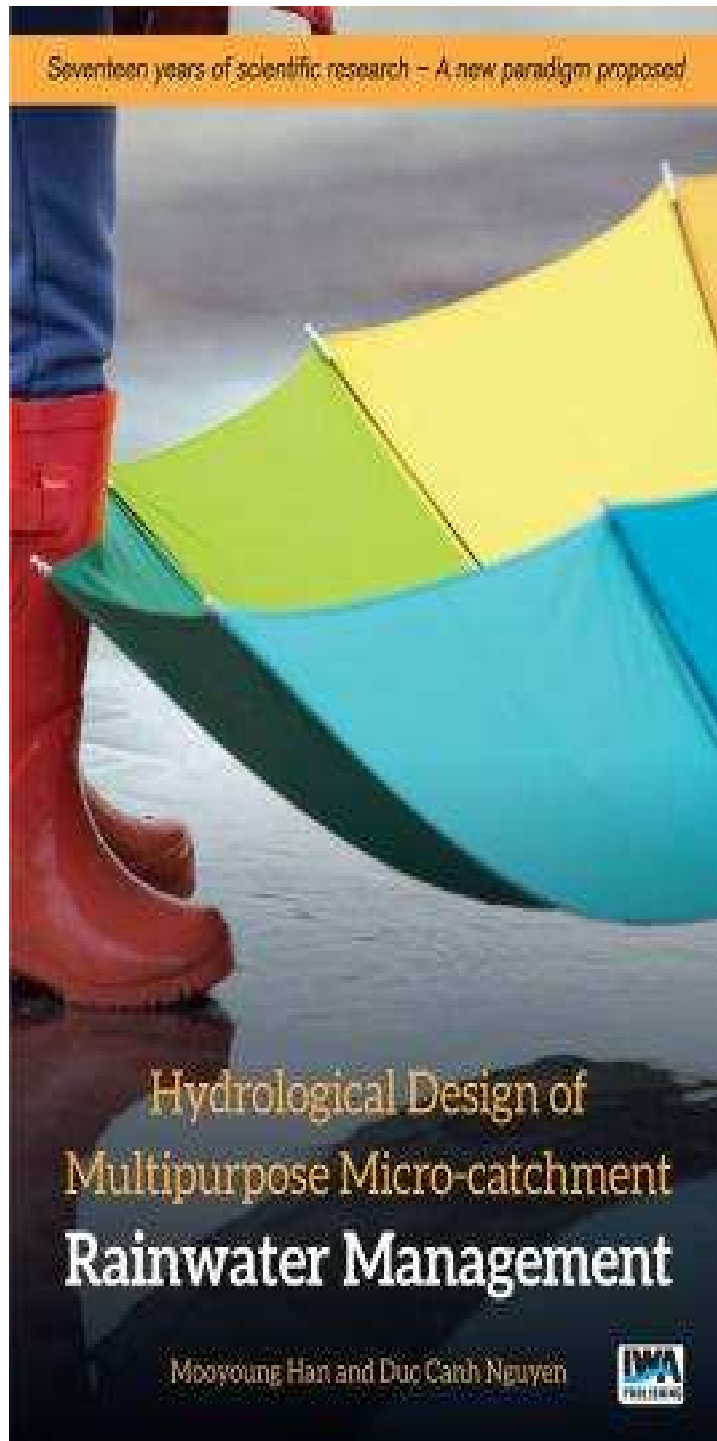


- 1) *Rain is money*
- 2) *Spread rain, and govern rain*
- 3) *Collect rain upstream at a small scale*
- 4) *Make it multi-purpose*
- 5) *Social responsibility of rainwater management*

2

Rainwater Management



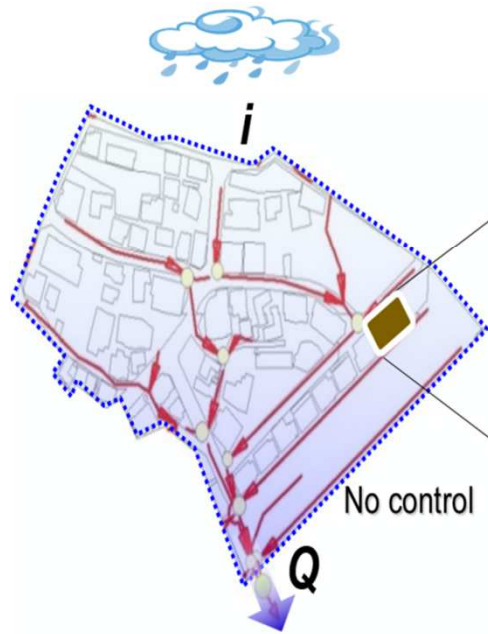


New Paradigm of Water Management



Conventional Sewer System

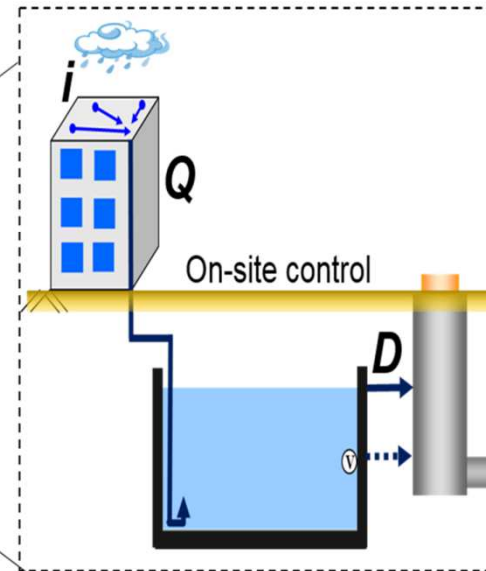
Area: $10^5 \sim 10^{10} \text{ m}^2$



Micro-Catchment RWMS

Building rooftop

Area: less than $\sim 2,000 \text{ m}^2$



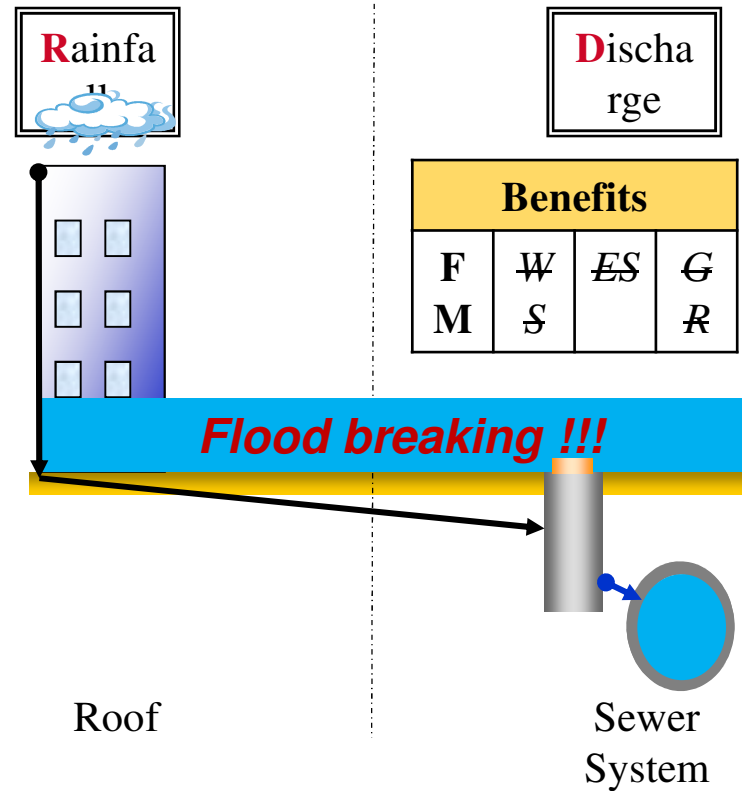
Factor	Conventional Sewer System
Drainage area	
Time of concentration	$10^5 \sim 10^{10} \text{ m}^2$ 30 min - hours
Position	End-of-pipe
Purpose	Flood mitigation
Controllable	

Factor	Micro-Catchment RWMS
Drainage area	Less than $2,000 \text{ m}^2$
Time of concentration	~ 0 (5-10 min)
Position	On-site
Purpose	Multi-purpose
Controllable	

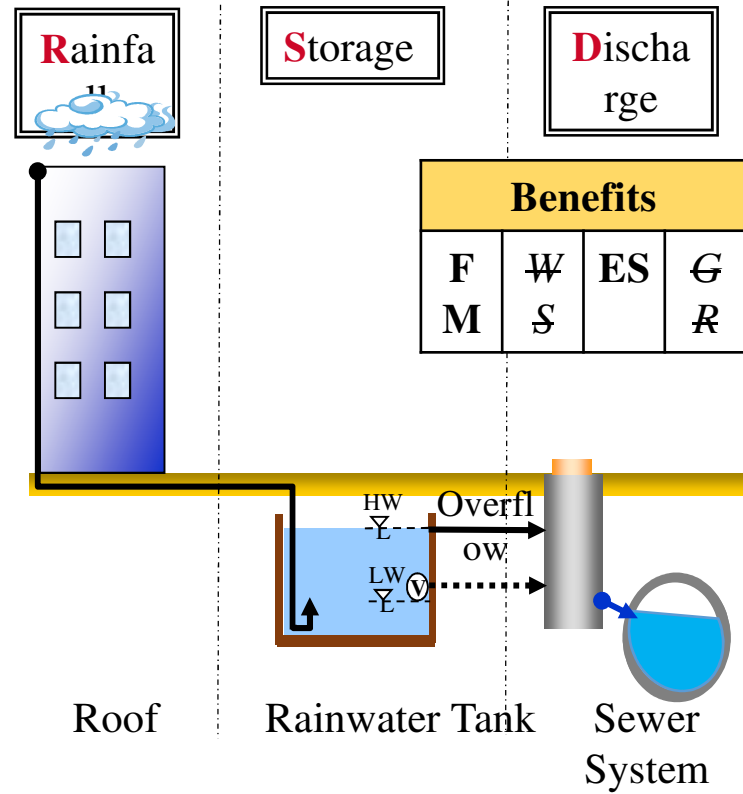
Main Arguments

- Evolution of Rainwater Management Models
- By on-site rainwater storage or infiltration, we can get multiple benefits such as
 - FM Flood Mitigation
 - WS Water Supply
 - ES Emergency Storage
 - GR Groundwater Recharge

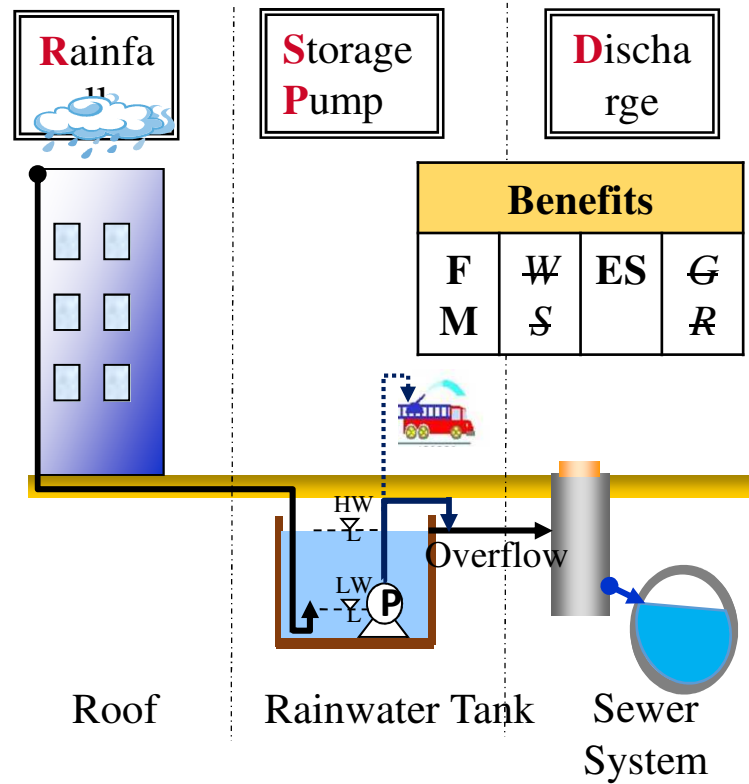
R-D Model



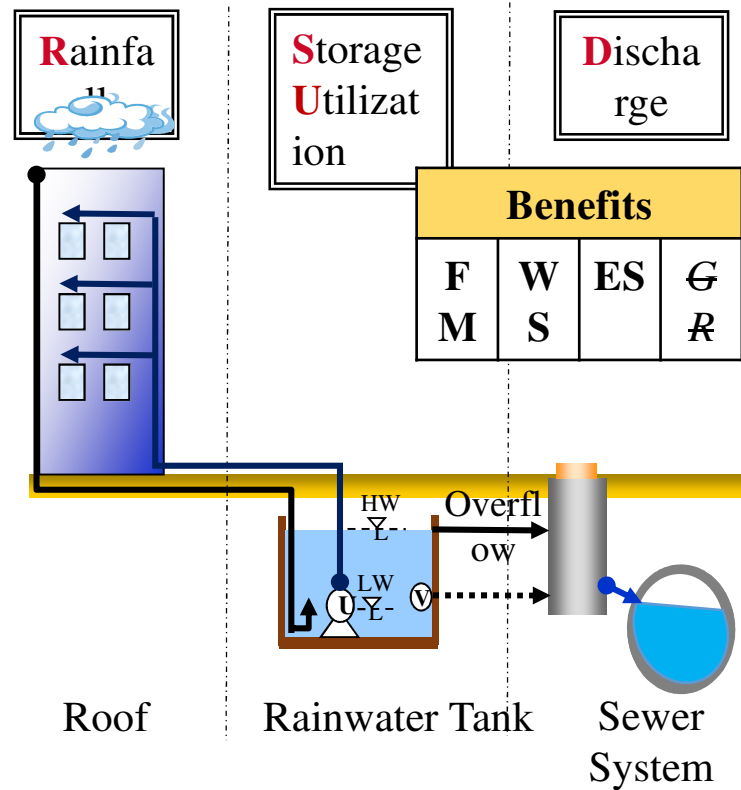
R-S-D Model



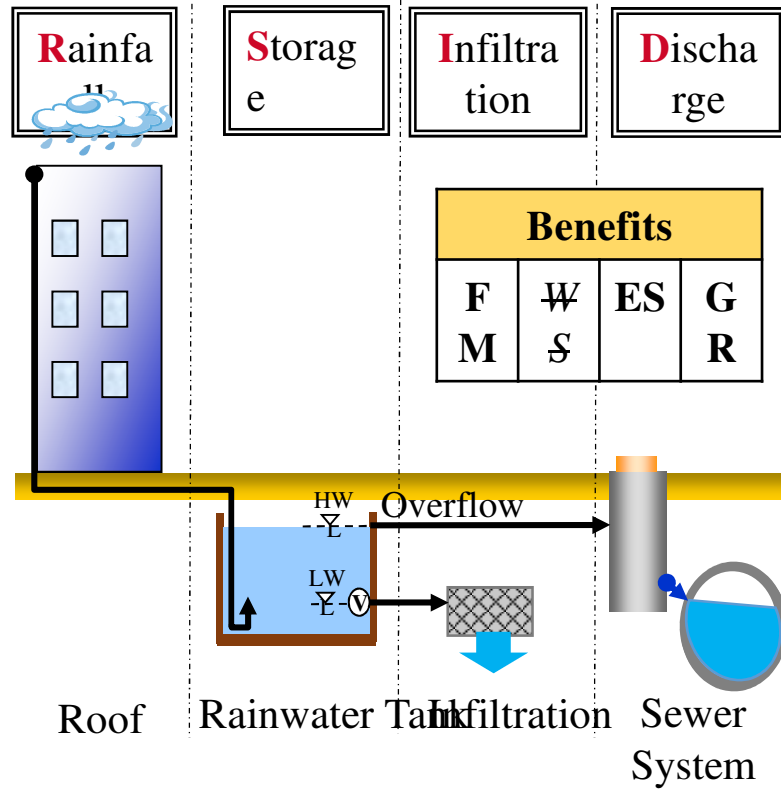
R-S-P-D Model



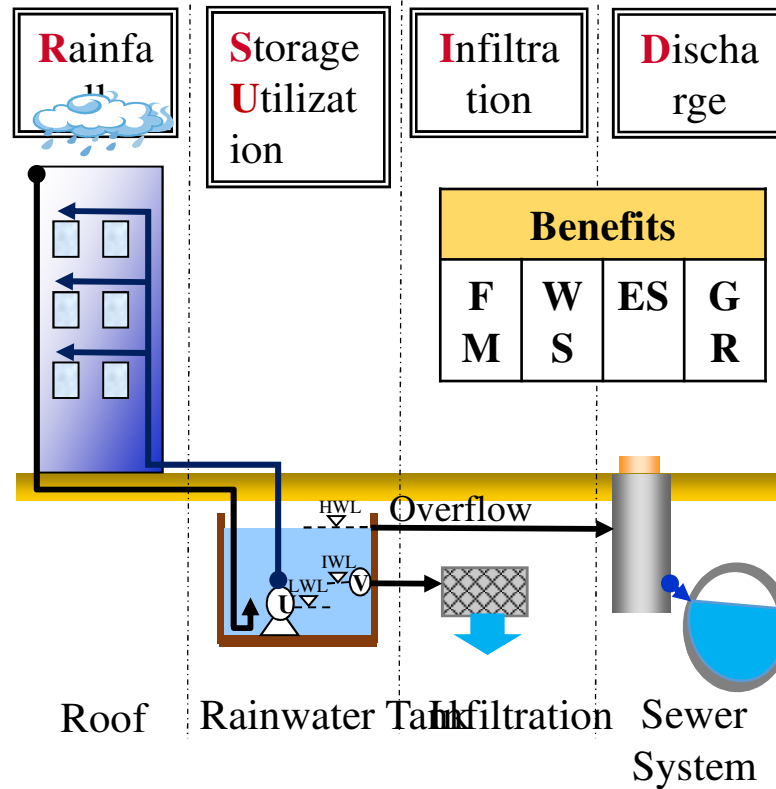
R-S-U-D Model



R-S-I-D Model

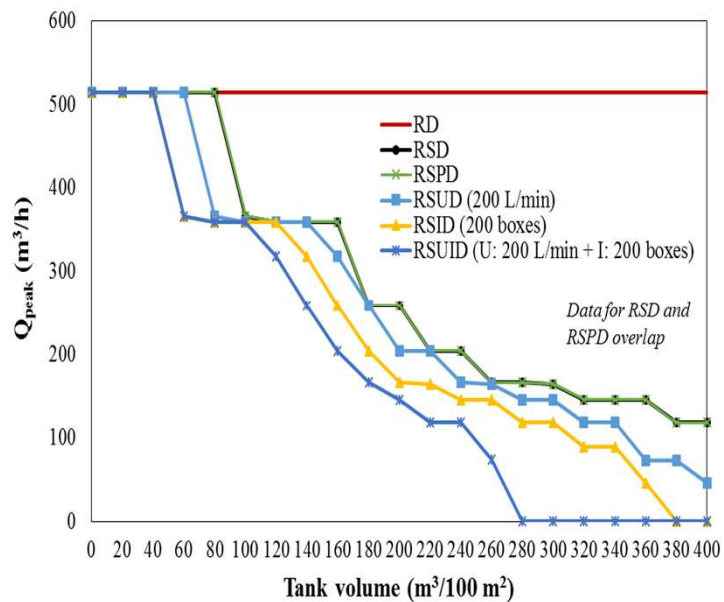


R-S-U-I-D Model

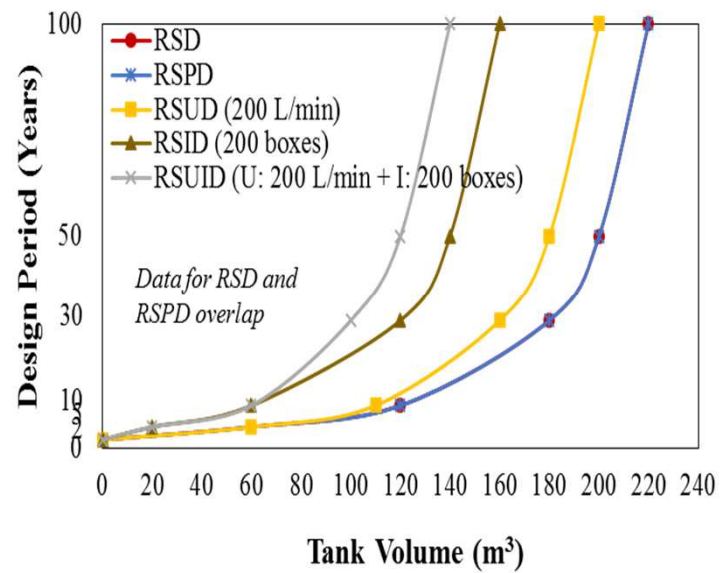


Design Example

Location: Seoul city,
Building rooftop: 2000 m²



TP (Tank volume-Peak runoff) curves

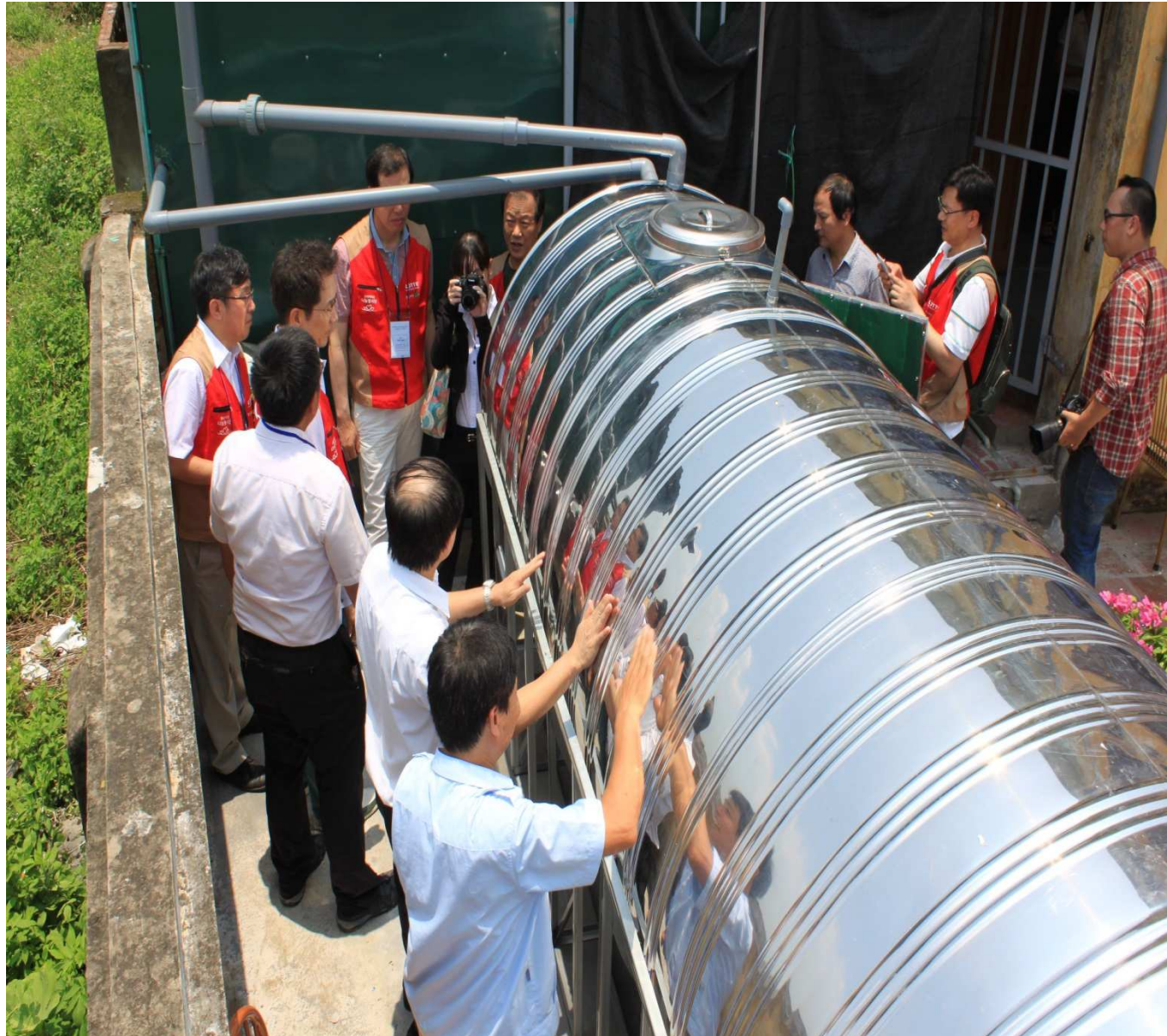


TD (Tank volume-Design period) curves

3

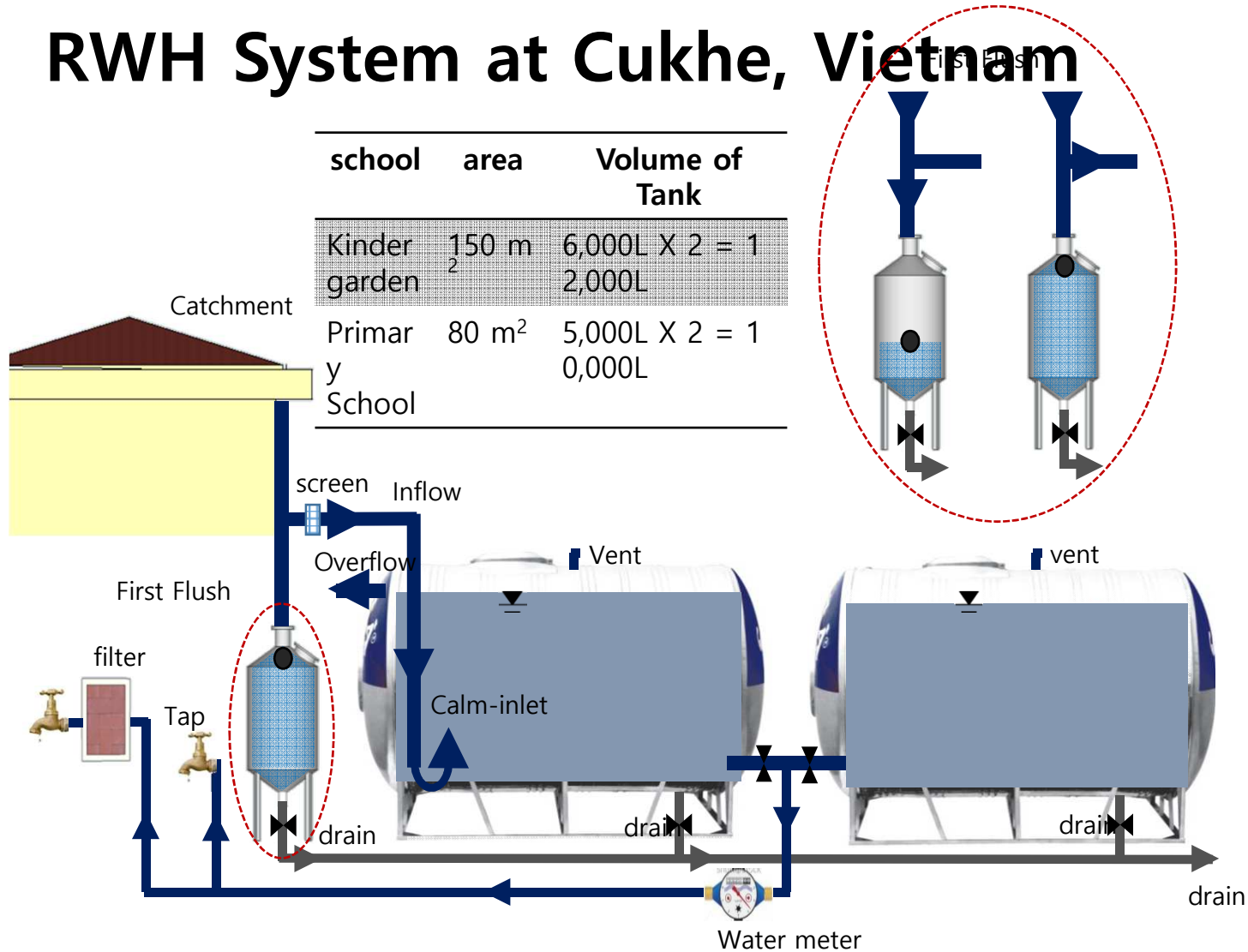
Rainwater For Drinking





RWH System at Cukhe, Vietnam

school	area	Volume of Tank
Kinder garden	150 m ²	6,000L X 2 = 12,000L
Primary School	80 m ²	5,000L X 2 = 10,000L



4

Progress of Rainwater Harvesting and Management in Korea

water management

Several Examples in
Korea

Rain Festival – Seoul city



Watching
Movie in the
rain

Student Competition for Creative Rainwater Ideas– Seoul national

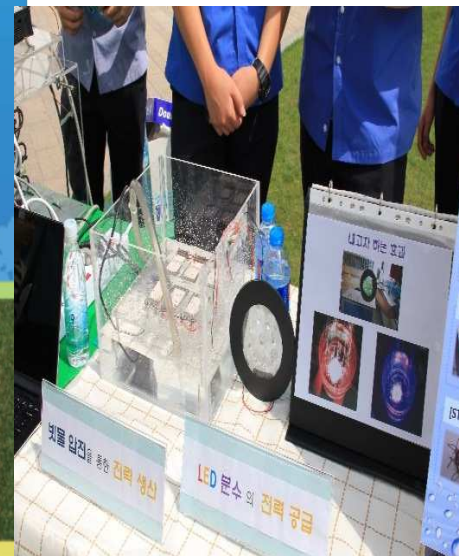
서울특별시 서울대학교 빗물연구센터

서울시-서울대와 함께하는
제4회
전국
창의적 빗물
경진대회



빗물은 소중한 자원입니다.
창의적 사고력과 탐구력을 토대로 빗물의 중요성을 일깨워 물을 절약하며,
빗물 관리와 빗물의 가치를 높이는 환경 시민을 육성하고자 합니다.
여러분들의 창의적인 아이디어를 가지고 도전하십시오!

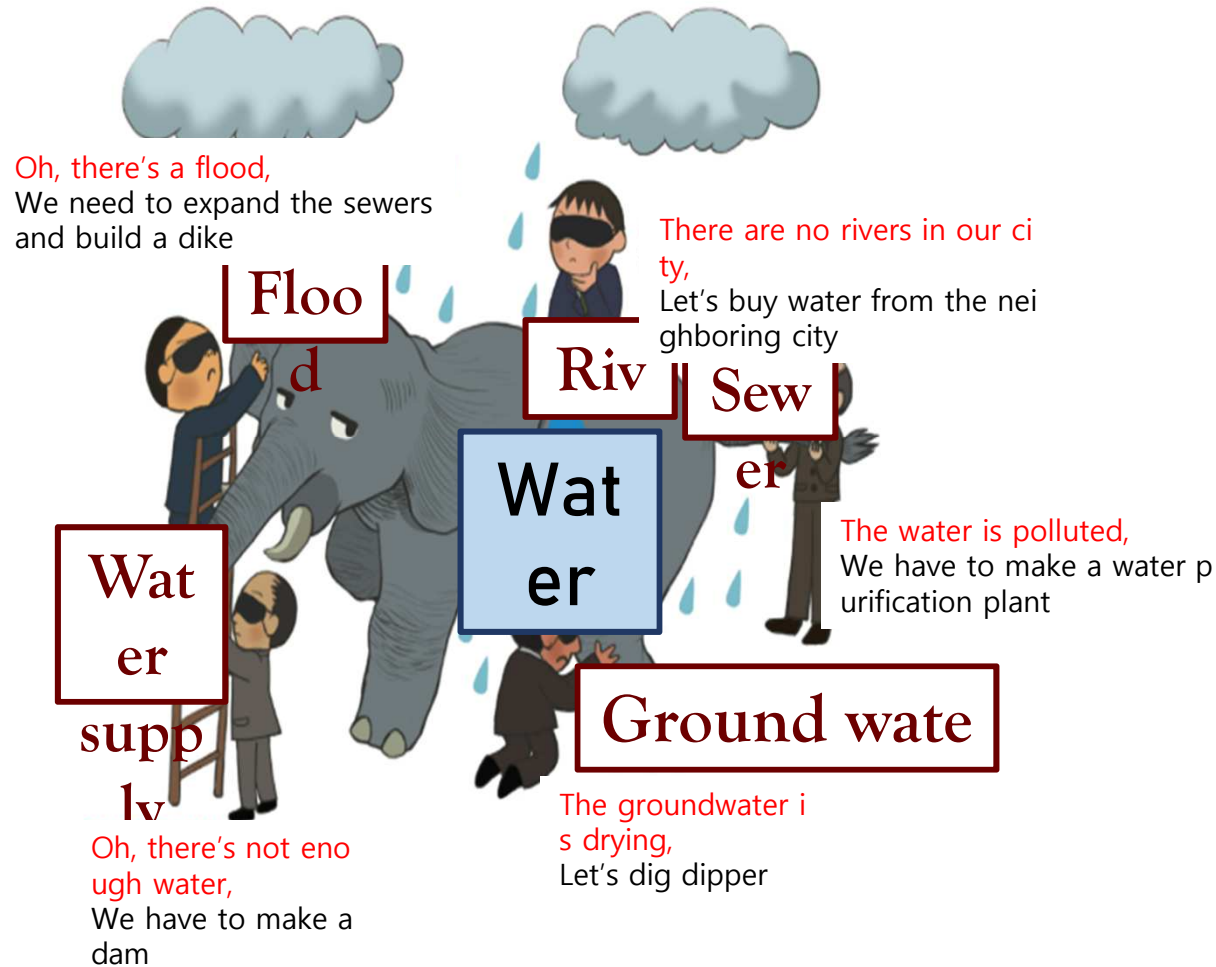
The logo features a lightbulb shape filled with icons of rainwater harvesting, wind turbines, and buildings. To the left, a faucet drips water into a cloud, with rain falling below.



involving politicians
(water management
research group in
M



New Korean Law Integrated Water Management by MOE



Everybody happy Rain Water Management

비
포기
비
포기
비
포기
비
포기

雨
水

金
水



Thank you

Rain is money!