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KGID 2025 Green Growth: The Path to Sustainable Jobs

Toward a Climate-Resilient & Carbon-Neutral Future: Goyang City's Journey

Focused on Climate Adaptation through Green and Water Resilience

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Goyang Special City
is located northwest of Gyeonggi province, adjoining Seoul to the southeast, and the Han River to the southwest

Population
1,075,862 people
465,169 households
(As of July, 2025)

Area
268.08km2
Forest 31.1%,
Agriculture 21.2%,
Land 13.4%, Road 7.6%

Environment
1 River (Han River), 69 Streams
1 Ramsar Wetland
1 National Park, etc.

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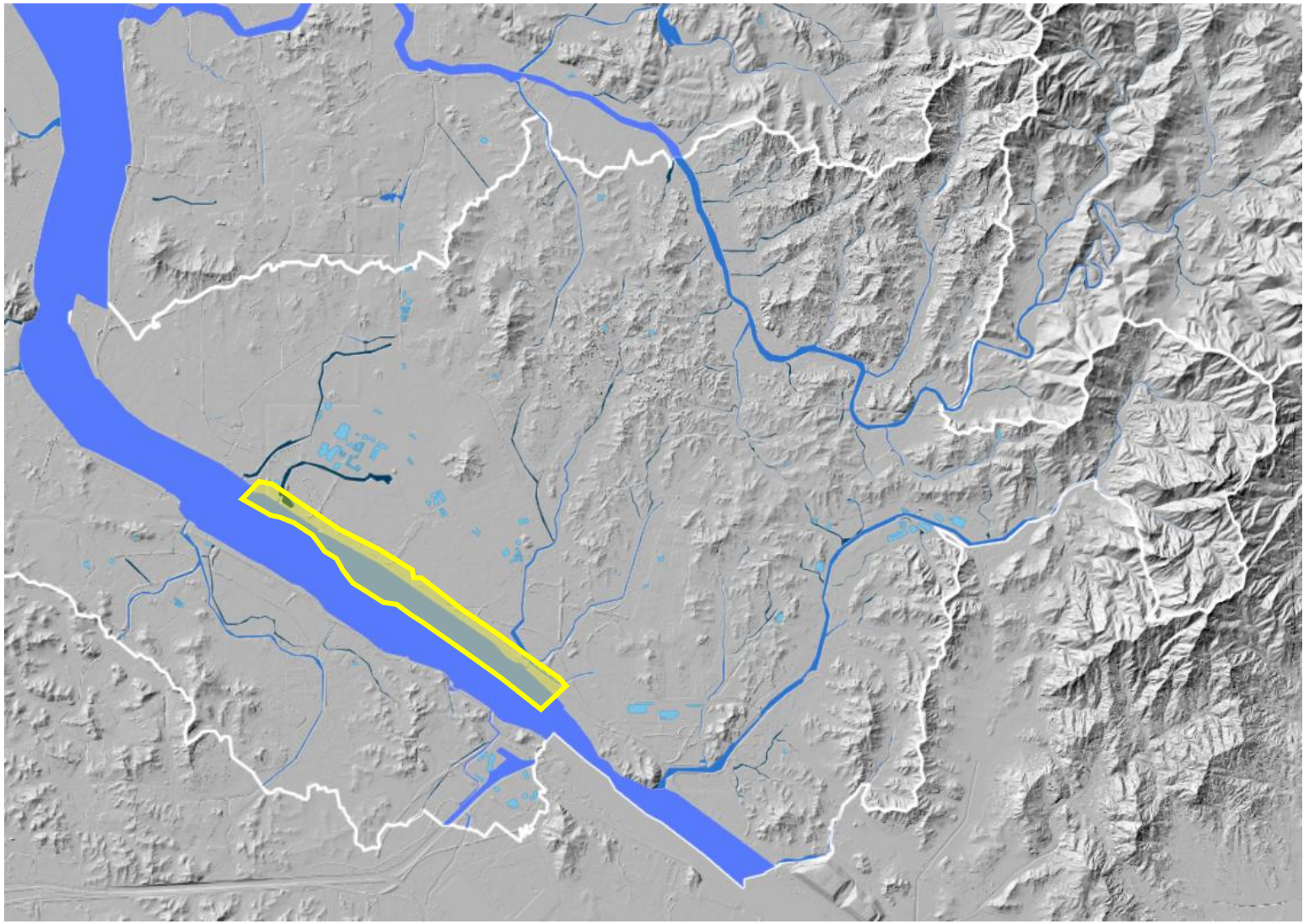
River & streams in Goyang

1 River (Han River), 69 Streams



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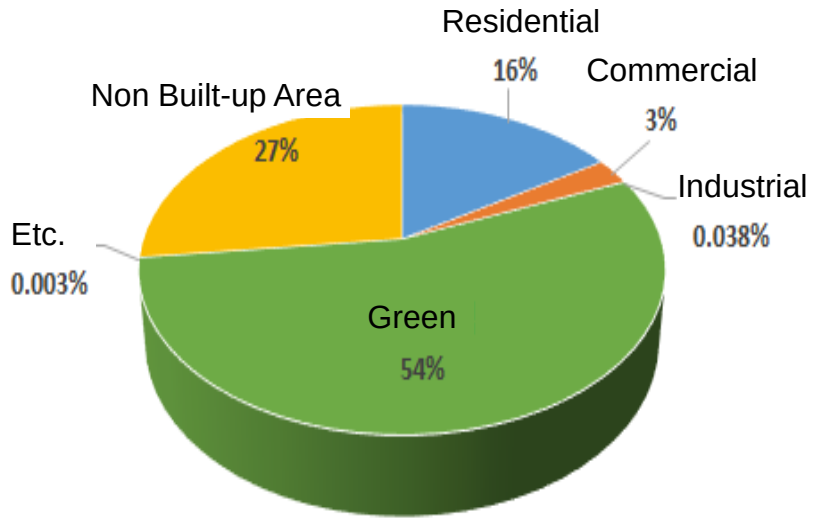
Land use in Goyang (Zoning)

- **Approximately 60% of Goyang City's urban planning zones are green areas**
- 60% of these green areas are included in new development plans and are scheduled to be converted and utilized as residential and commercial zones in the future.

(unit : km2)

Year	Built-up area					Non Built-up Area
	Residential	Commercial	Industrial	Green	Etc.	
2012	34.59	5.64	0.07	150.54	1.19	75.28
2013	34.90	5.64	0.07	150.24	0.23	76.24
2014	35.06	5.65	0.07	150.29	-	76.24
2015	36.48	5.46	0.07	149.85	-	74.56
2016	36.47	5.49	0.07	149.82	-	74.56
2017	36.77	5.49	0.07	149.52	-	74.56
2018	37.77	5.72	0.07	149.85	-	72.99
2019	38.11	5.83	-	149.48	0.71	72.28
2020	38.41	5.92	-	149.10	1.55	71.43
2021	42.85	6.96	0.10	145.09	0.01	71.41



Land Use in Goyang (Zoning) (2021)

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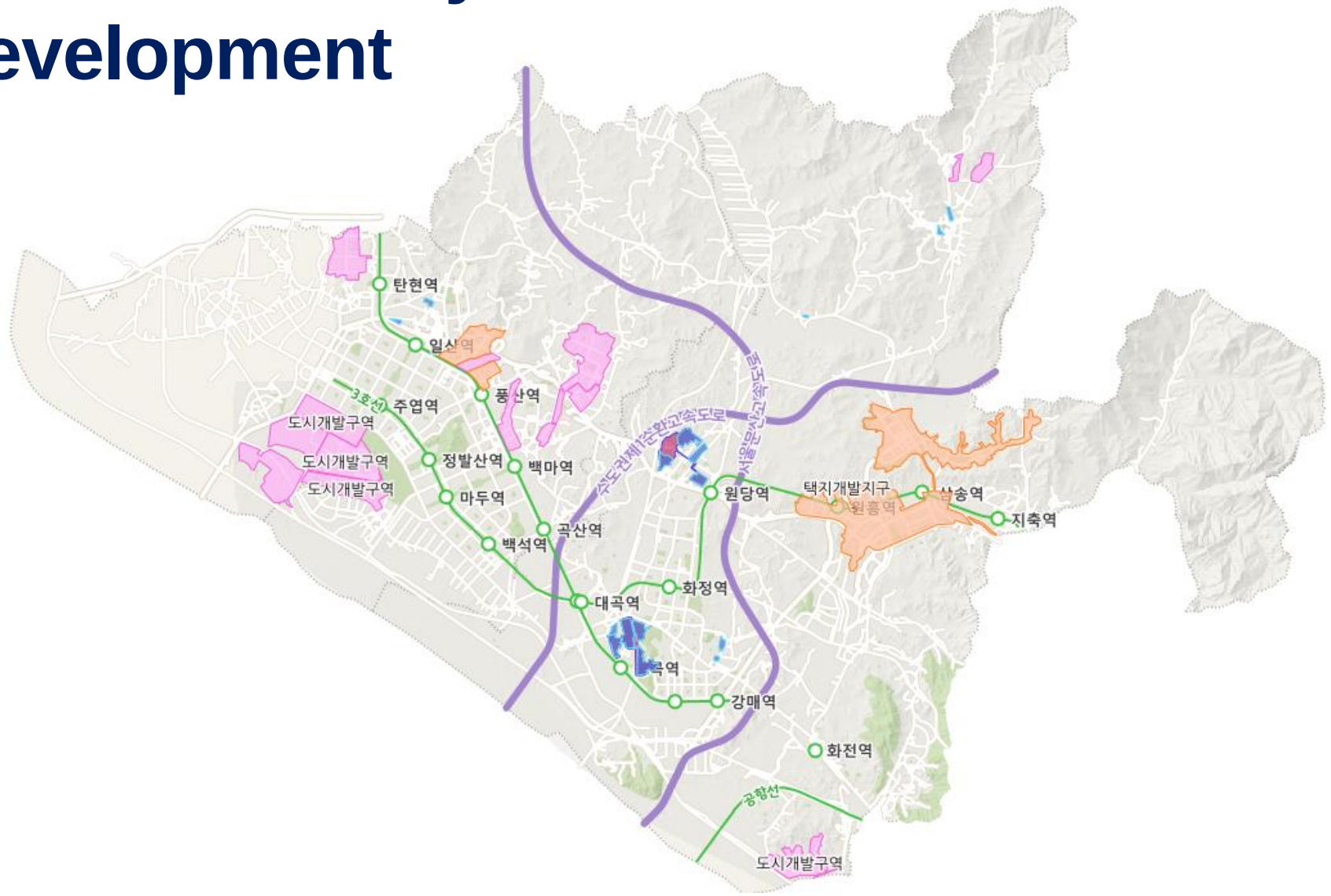
Planned or Underway Land Development



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https://www.yna.co.kr/view/PYH20220808177800060

The Risks Facing Goyang City

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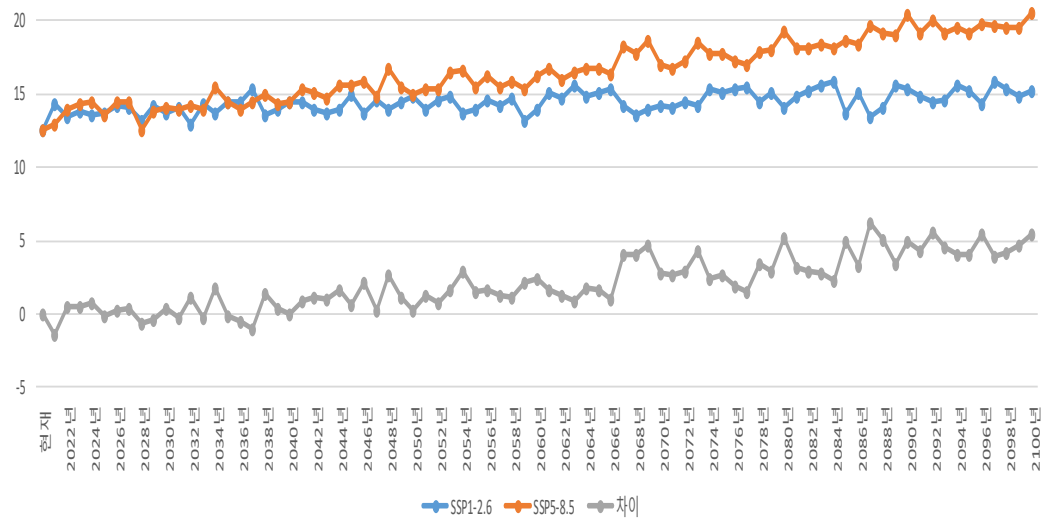
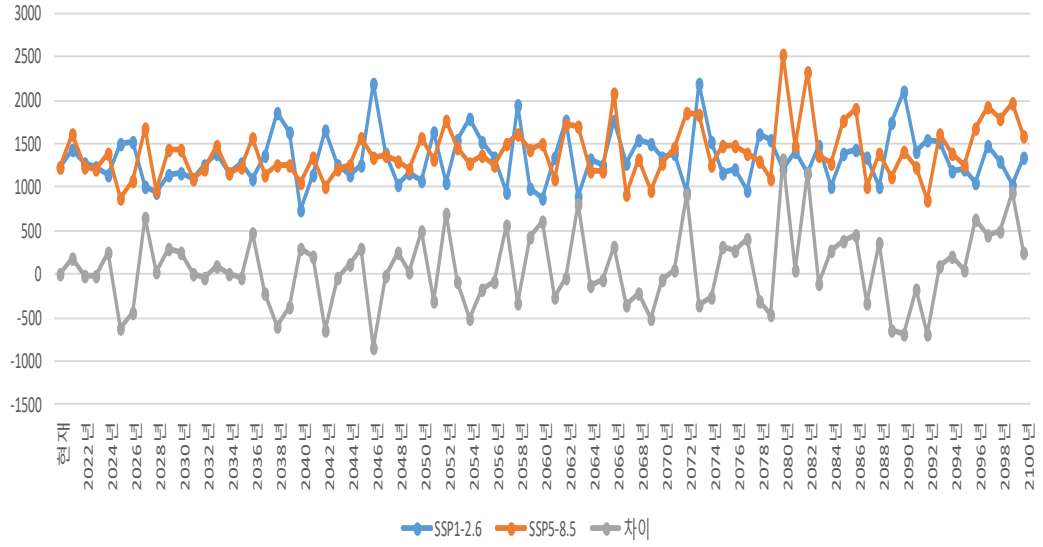
Current status & Projection of Climate

- The average temperature: increase about 1.0°C (2013-2022)
- Monthly average precipitation: decreased by 9.6 mm (92.0 mm → 82.4 mm)

Scenario	Tendency per decade	Avg. Temp. (°C)
SSP1-2.6	+0.17	13.7
SSP5-8.5	+0.81	15.7



Scenario	Tendency per decade	Avg. precipitation (mm)
SSP1-2.6	+18.49	1340.9
SSP5-8.5	+42.74	1408.4



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Current status & Projection of Climate

- Total precipitation ↓ Precipitation Intensity & Daily Maximum rainfall ↑
- **Greater flood risk** despite overall drier conditions

Precipitation Intensity (mm)

Time	Scenario	
	SSP1-2.6	SSP5-8.5
Present(2000~2019)	**16.6**	
2021~2030	**18.6**	**18.7**
2031~2040	18.9	18.2
2041~2050	18.6	19.3
2051~2060	19.7	19.1
2061~2070	19	19.4
2071~2080	19.5	20.5
2081~2090	19.2	20.1
2091~2100	**18.4**	**20.4**

Daily Maximum Precipitation (mm)

Time	Scenario	
	SSP1-2.6	SSP5-8.5
Present(2000~2019)	**131.9**	
2021~2030	**162.3**	**168.9**
2031~2040	166.8	172.7
2041~2050	166.4	178.6
2051~2060	173	187.9
2061~2070	156.2	176.3
2071~2080	185.1	197.7
2081~2090	186.5	171.7
2091~2100	**170.9**	**184.9**

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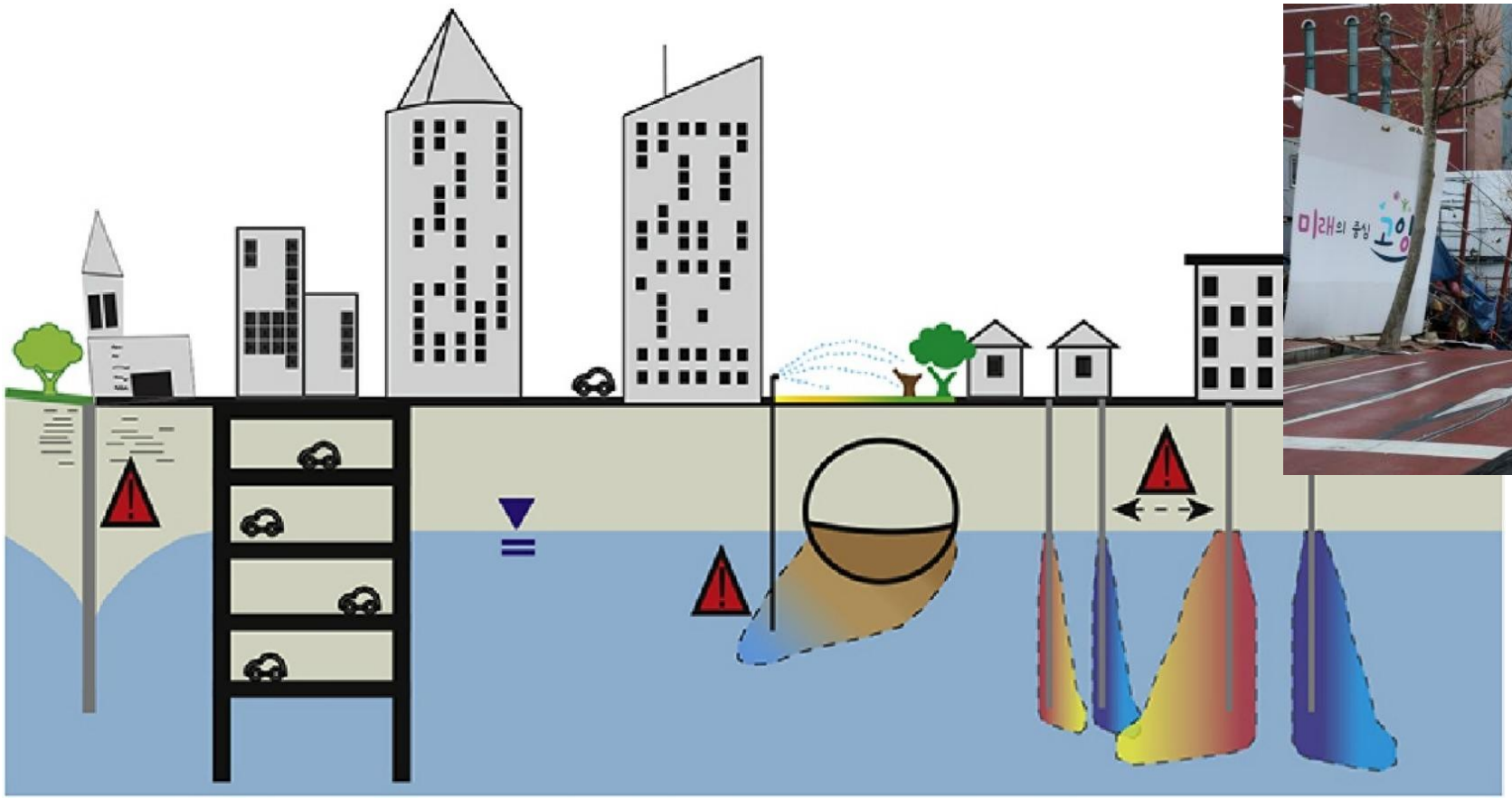
Extreme development of underground structures

→ Sharp increase in the discharge of groundwater



Source : Attard, et al.(2017), Land Use Policy, v.64, p.461-469

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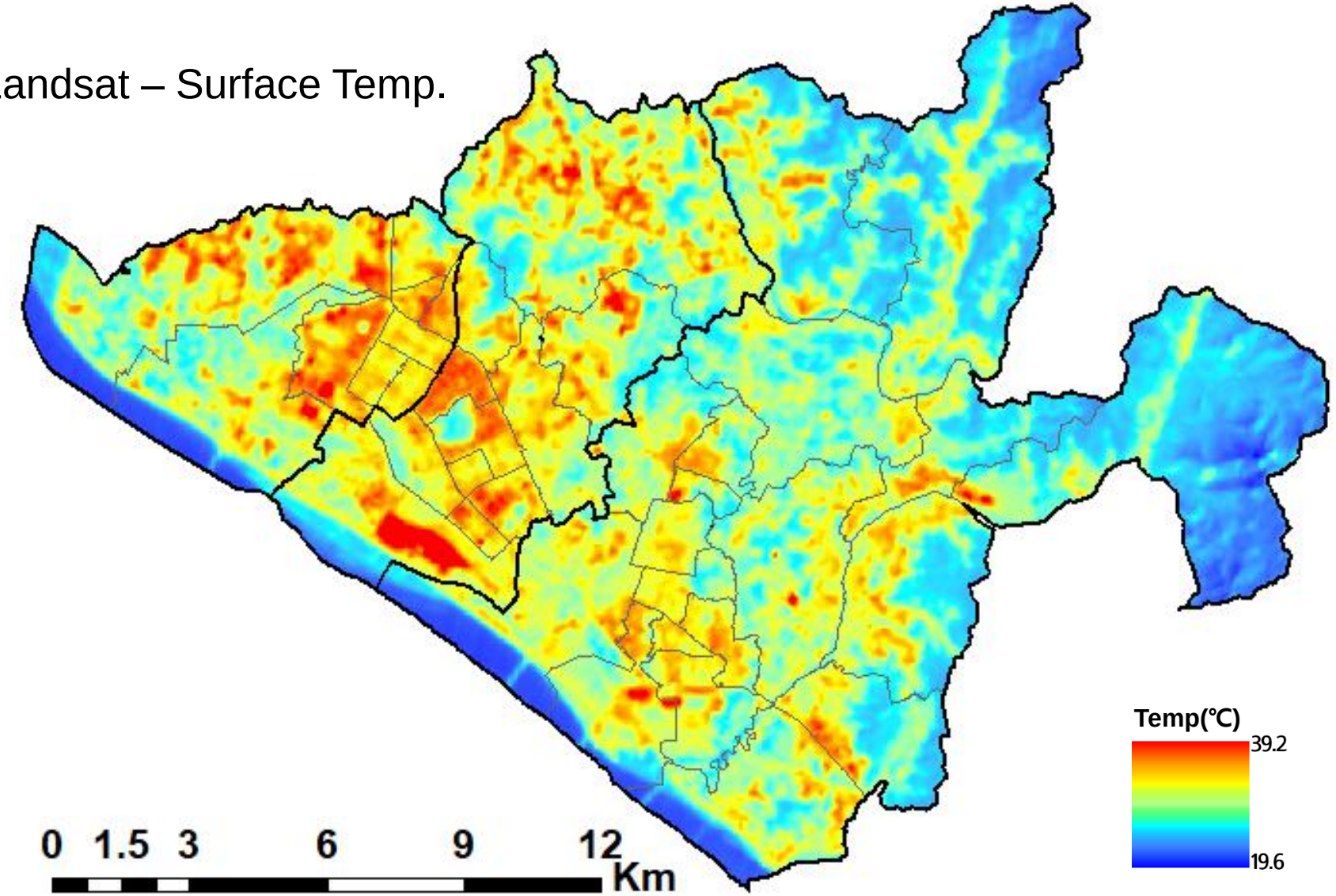
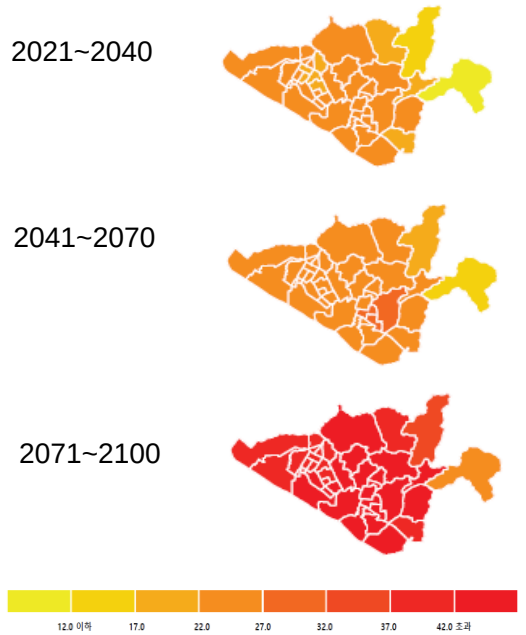
Urban Heat Island

- Landsat – Surface Temp.





Forecast for Days of Extreme Heat

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Urban Forest

To enhance urban greenery and resilience

We built the Urban Forest, Pocket Forest and renovated current parks in the city

Boost of Carbon Sinks with more green areas

Goyang Declaration of Tree Rights (March, 2019)

- Build the basic principles of management of trees on public land
  ➡ A green city where people and trees coexist

Planting 1.05M trees for hope (2018~2021)

- Create urban forests to secure green spaces in the city
- Build a road with the length of 100 ri (39.27km) along with clean river green forest

Key achievements

- Solutions for urban heat wave hazard caused by fine dust & heat island effect
- Absorption of **9,555 tCO_2** annually

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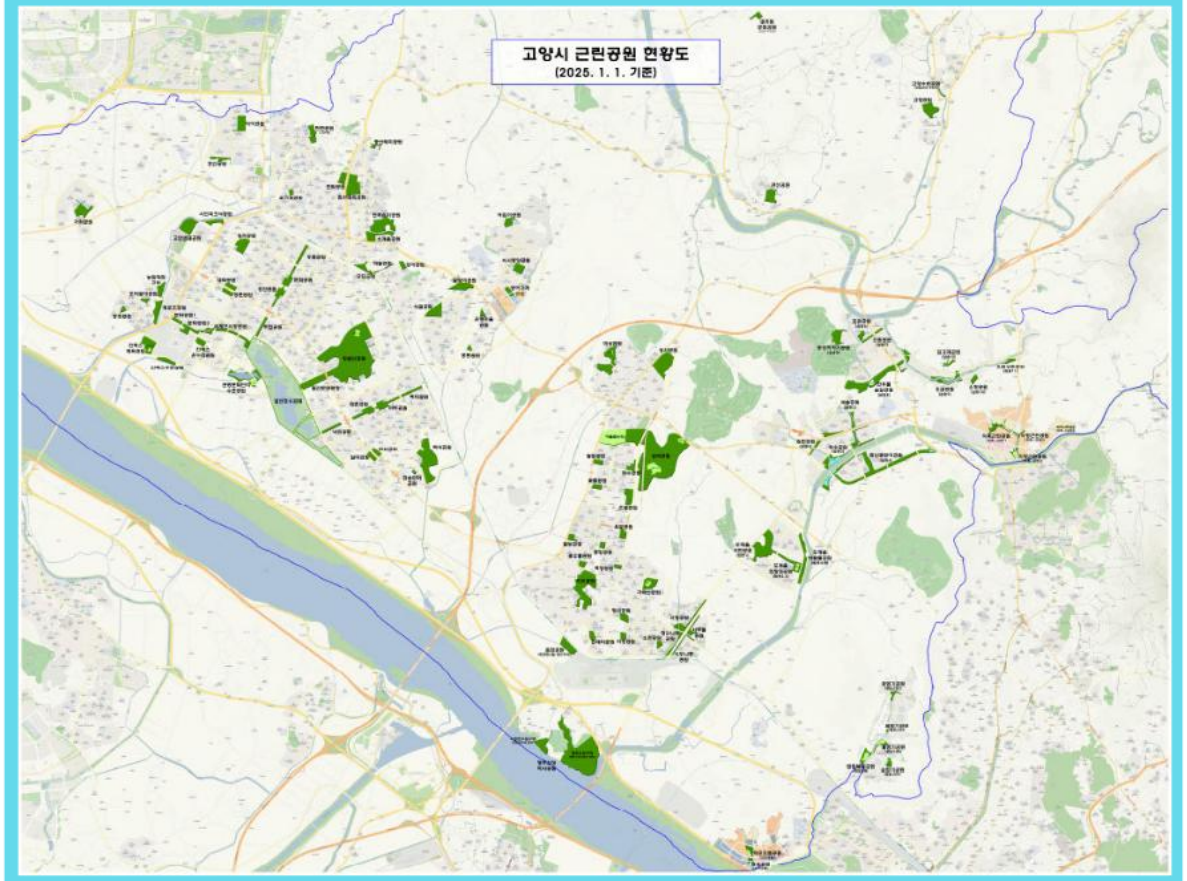
Create More Green Space

Purpose of the project

- **Reduction of fine dust**: Direct, City-Level, natural remediation solutions are needed to alleviate high air pollution levels in the metropolitan area.
- **Mitigation**: Expanding carbon sinks & providing eco-friendly shelters for citizens in reponse to rapid urbanizations and rising temperatures.
- Adaption: Providing citizens with a green space they can enjoy: Improve health & well-being by creating green space within citizens' living areas.
- Building a sustainable Urban model

Key achievements

- Creation of **47** urban forest · pocket forest
- Expanding green space by 8,600 ㎡ using idle land around the residential area



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Gobong-ro
Fine Dust
Blocking Forest

Baekmaro
Fine Dust Reduction
Urban Forest

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Key Achievements

Providing **improved air quality, ecological restoration, climate buffers** and **rest areas** for citizens within the city center

9 New Pocket Forest


Pungdong Sikgol Park


Baekseok Neighborhood Park


Todang-dong Ji-Do Park


Madu-dong Cheongpyeongji

14 Street Forest

24 parks **were renovated**

Reduce unnecessary **paved areas** and expand **green spaces**.

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Sustainable Urban Water Management

Overview

01

Separated sewer system

- Distinct sets of pipes:

sewage & stormwater prevents the overflow of treatment plants during storms, reduces the volume of wastewater requiring treatment, and eliminates the pollution of the sewage system by runoff containing contaminants like oil and heavy metals

02

Multi-purpose design

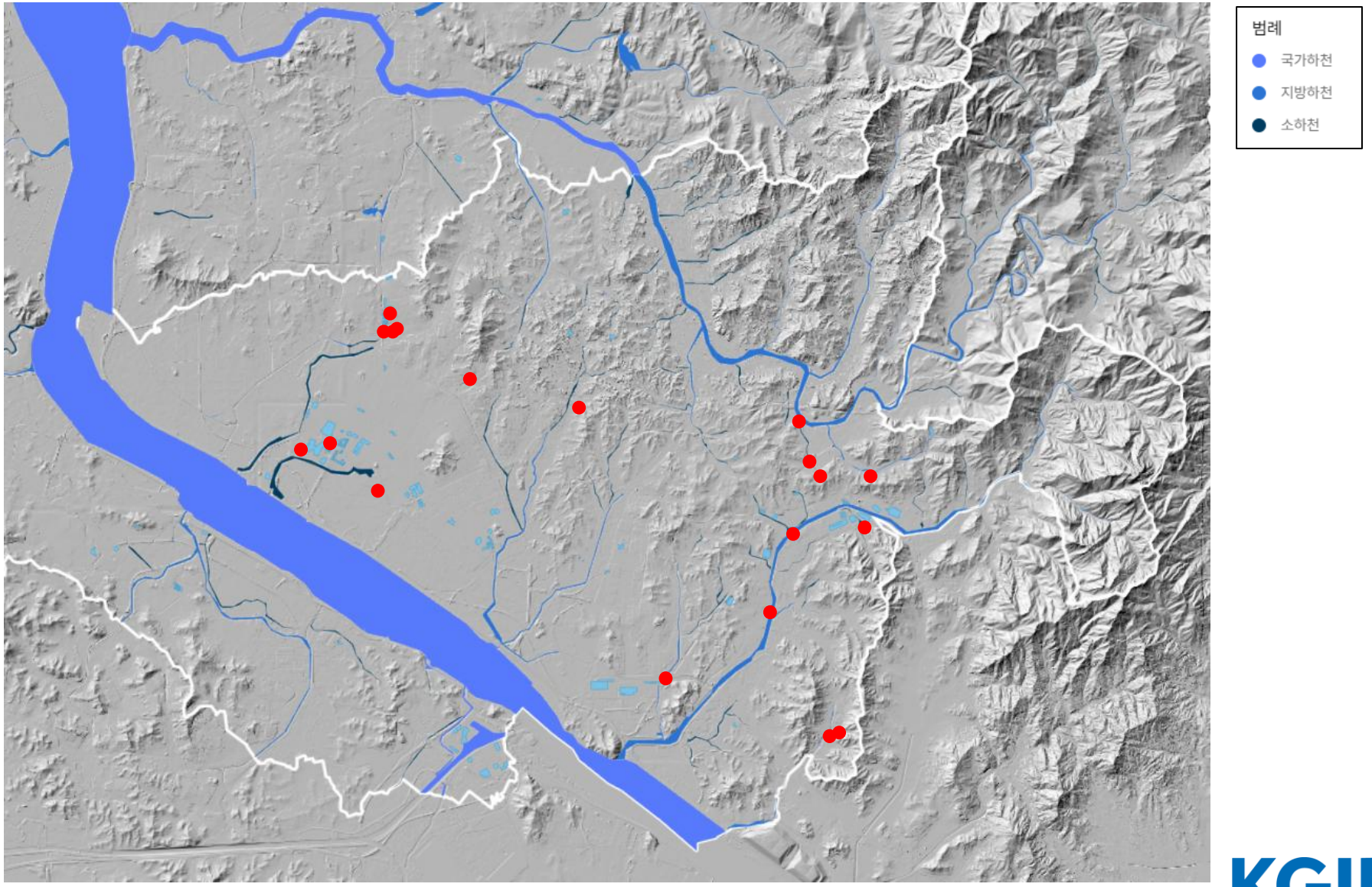
Detention Basins + Retention Basins
flood safety + community use

Flood control facilities

- Total 20 spots
- Detention Basins

  15 spots
- Retention Basins

  5 spots



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Flood Control

01

Detention Basin (Dry Pond)

- Normally dry
- Used for recreation: Basketball courts, trails, etc.
- During heavy rain: Temporary floodwater storage

02

Retention Basin (Wet Pond)

- Maintains permanent water
- Functions as: Wetland habitat, water quality improvement, Community boardwalks & leisure

When developing residential land near rivers, **flood control facilities** must be designed.
We also try to ensure that they serve multiple purposes.

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Reuse “Rainwater” to improve Water Cycle

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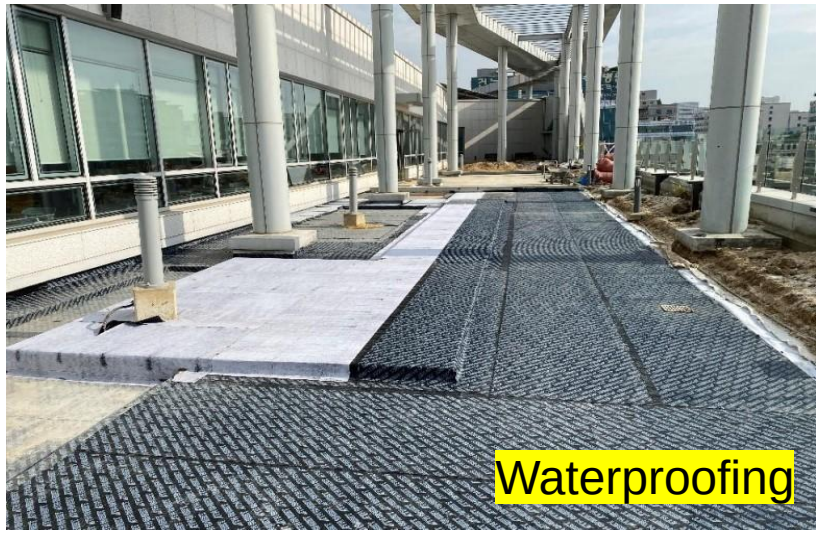
Reuse “Rainwater” to improve Water Cycle



Ilsanseogu Office (2022~2023)

- Rooftop garden with rainwater tanks & PV panels

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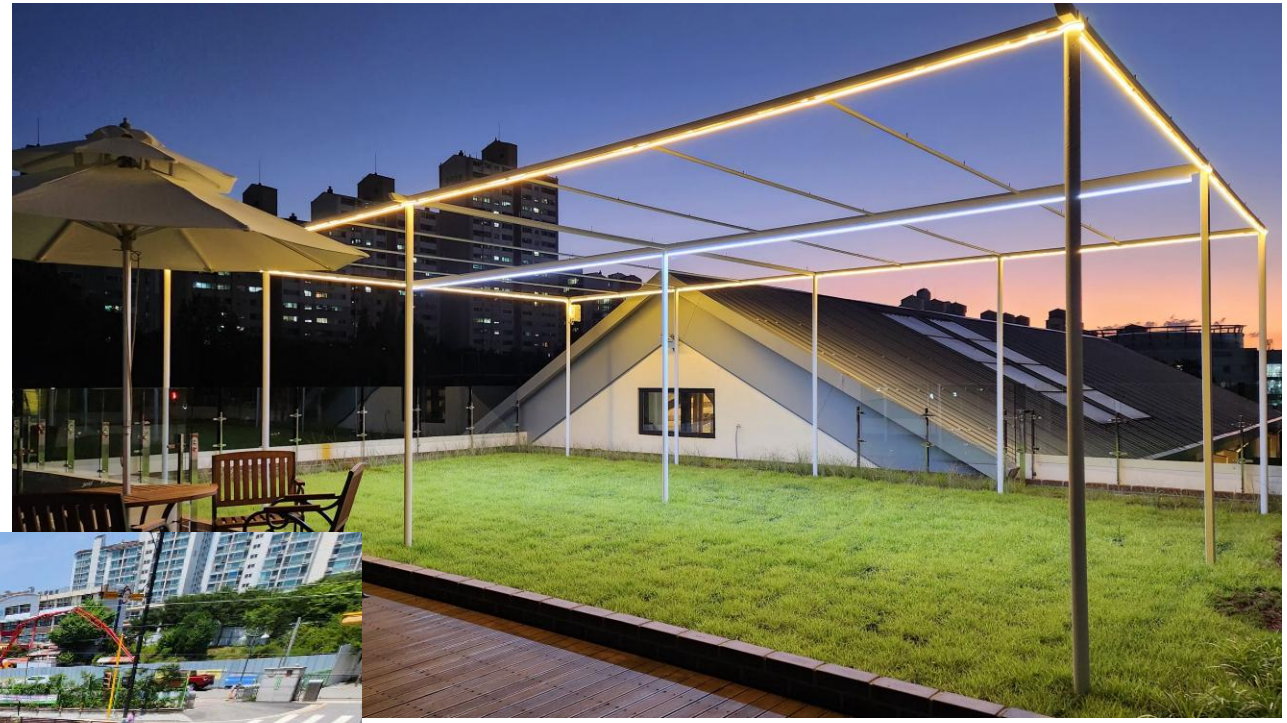
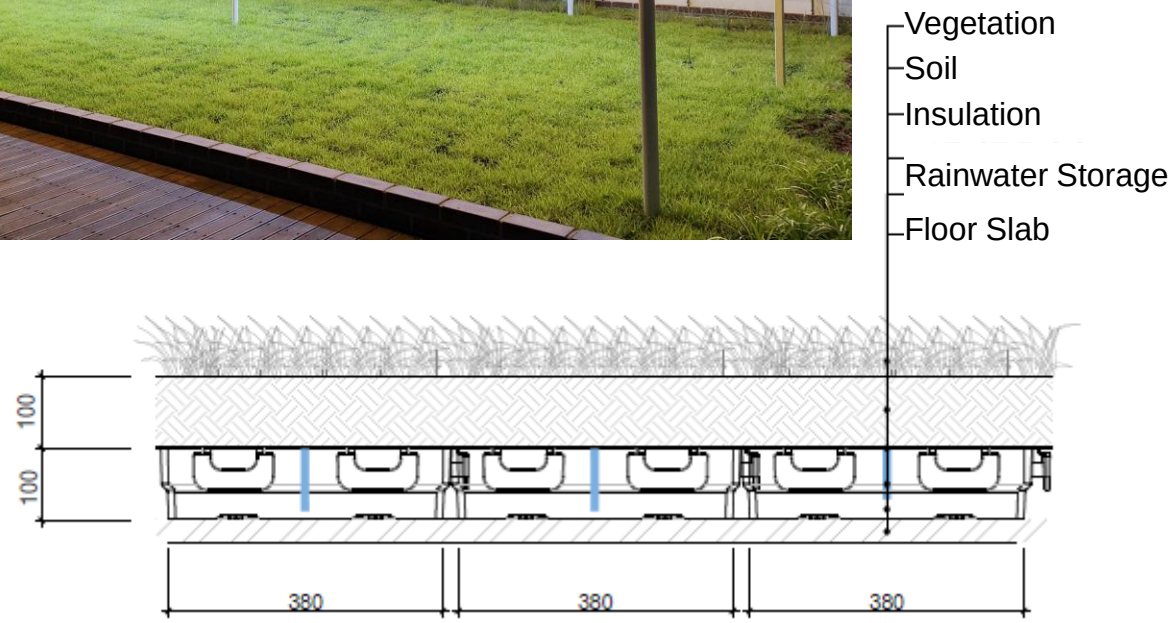
Ilsan Culture & Arts Creation Center (2023~2024)

- Rooftop garden with rainwater storage plates





Rainwater Storage Plate

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Cooling & Clean roads against the Urban Heat island

using a brine sprayer

- Surface temperature ↓
- Suppression of fine dust resuspension
- Reduce sprinkler truck operating costs
- Low facility operating costs

※ Electricity usage costs $1,000/year

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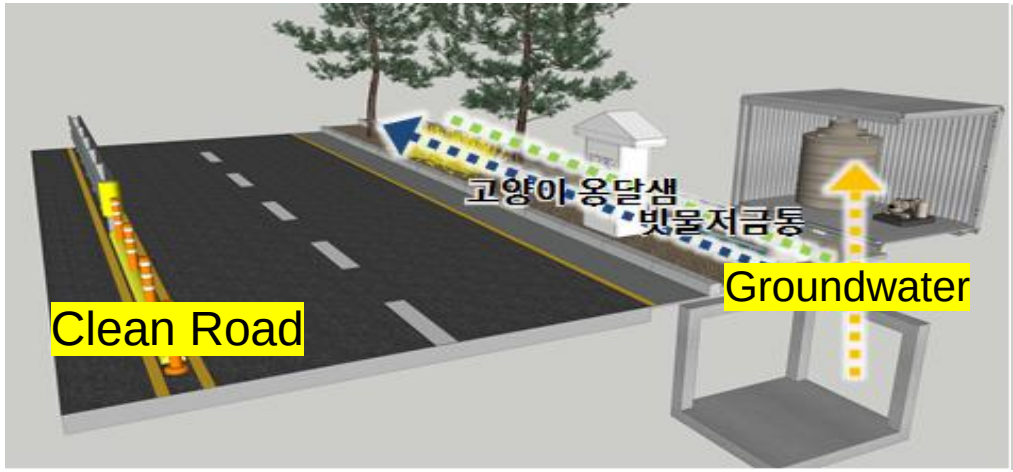
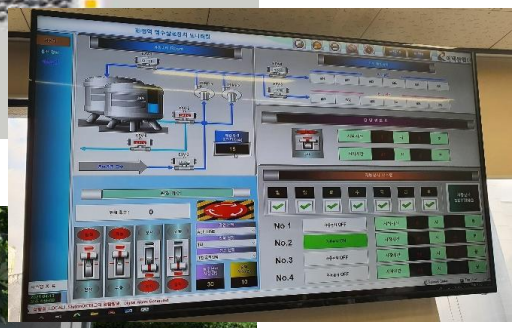
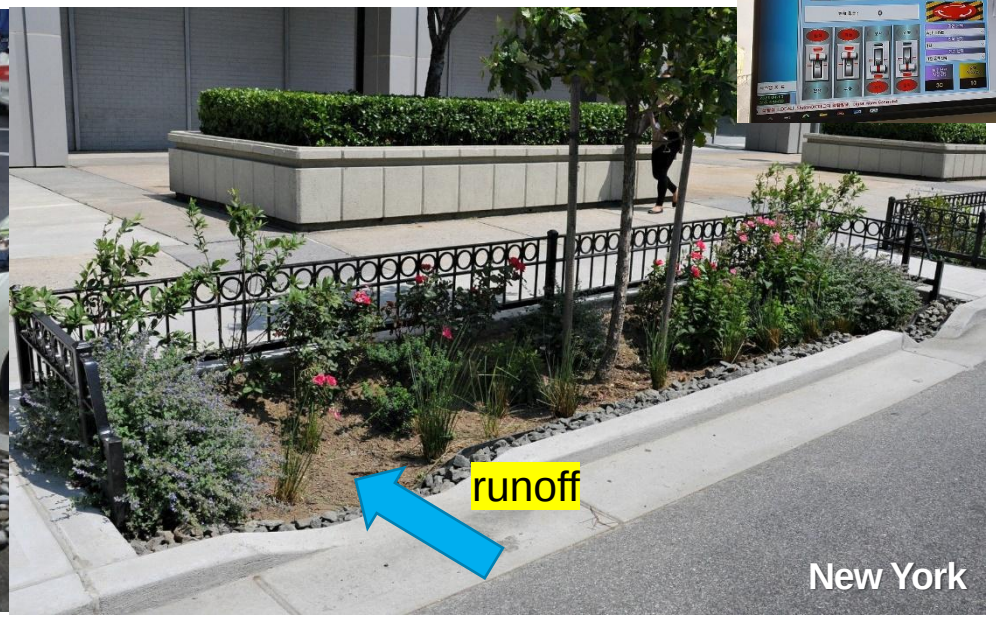

고양아 옹달샘
빗물저금통
Groundwater
Clean Road


수로 연결
수생식물
여과 및 흡착
Groundwater
Drainage




고양이 옹달샘
Groundwater
Goyang


runoff
New York

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“Start small, act local, and grow resilient.”

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Thank you for your attention

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