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ADDING AND CONNECTING MORE PIECES OF URBAN WILDLIFE HABITATS

Tong Mahn AHN Professor, Seoul National University, Korea
Nam Choon KIM Professor, Dankook University, Korea

Urban green spaces are major wildlife habitats
Limited urban green spaces mean limited urban biodiversity

- **Up-Lift Approach (ULA)** - identifying and putting higher priority on cities, or parts of cities, that are most green-poor

- **Green roof promotion program** - subsidizes half the cost of planning/design and construction costs of green roofs

- **Environment friendly building certificate** - gives credits for the certificate if a development project constructs land and/or water biotope

1. Cheonggyecheon stream restoration project in central Seoul
2. green network plan for new national capital city (Sejong city)
3. active promotion of urban agriculture by many cities

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More urban green spaces for people may mean more urban biodiversity


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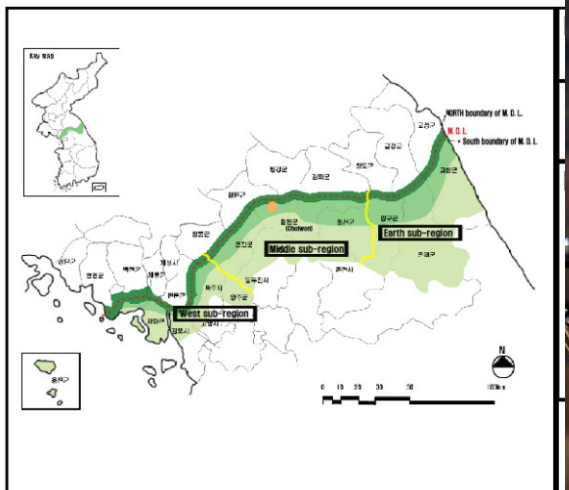
City Map
NORTH boundary of M. D. L.
M. D. L.
South boundary of M. D. L.
Middle sub-region
Earth sub-region
West sub-region
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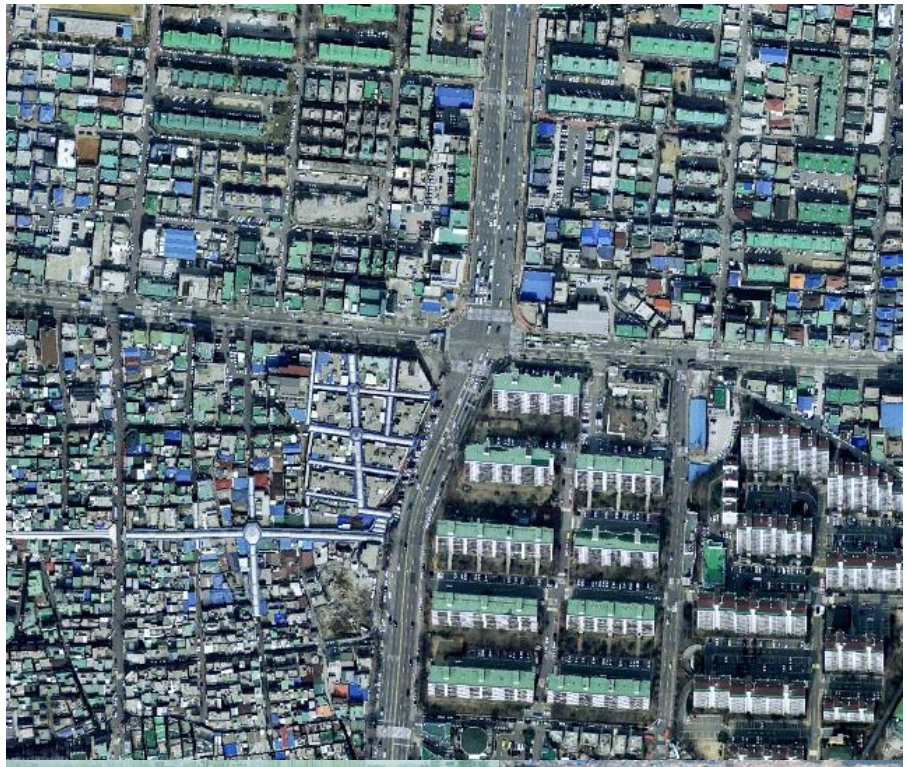


More urban green spaces for people may mean more urban biodiversity

- **Many Korean cities** provide far below the minimum standards of park area per capita (Ahn et al 2013)
- **There are 83 cities** in South Korea. Cities are defined as developed areas housing 50,000 or more people. The biggest is Seoul and its population is over 10 million.
- **Compared to many larger cities in the world**, Seoul city provides much less urban park area per person. (Table 1)

Table 1. Urban park area per person of selected cities (㎡, 2010)

Seoul (Korea)	Paris (France)	London (U. K.)	New York City (U. S.)	Tokyo (Japan)
6.1	11.6	26.9	18.6	4.4

* Source: Ministry of National Land and Marine Affairs, Korea

- **Under the "Urban Parks Act" of Korea**, these 83 cities should provide a minimum of 6m^2 of urban parks per citizen.
- Major types of urban parks are home range parks, and thematic parks. (Table 2)

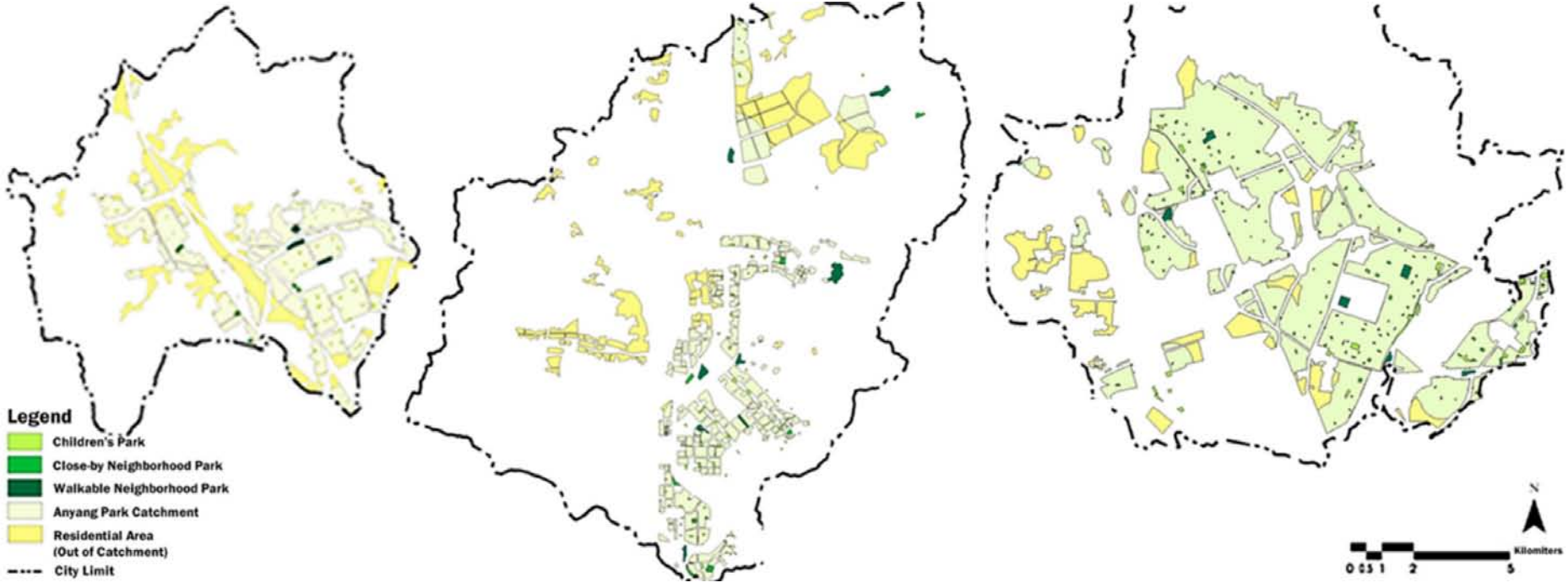
Types of Urban Parks			Catchments
Home range parks	Mini Park		not applicable (n.a.)
	Children's Park		**250m or less**
	Neighborhood Parks (NP)	**Close-by NP**	**500m or less**
		Walkable NP	**1000m or less**
		Regional-NP	n.a.
		Metropolitan-NP	n.a.
Thematic Parks	Historic Park		n.a.
	Cultural Park		n.a.
	Waterfront Park		n.a.
	Cemetery		n.a.
	Sports Complex		n.a.
	Others		n.a.

* Three types of urban parks in bold faces, which have catchment distances, are analyzed in terms of accessibility for three selected Korean cities

Table 2. Types of urban parks in Korea

- much of the residential developments are out of park catchment areas which means they do not have good access to parks within walking distance.

Fig. 1. Urban parks as urban wildlife habitats – analyses of area and distribution in three Korean cities (*Anyang, Seoungnam*, and *Suwon*)



- **Ahn et al proposed "Up-Lift Approach"** to provide more urban parks in cities or parts of cities where most park poor.
- **It means** more area and even distribution of urban parks are for the better uses by peop le and also more habitats for wildlife and for more enjoyment of wildlife by the people.

Cities	Anyang	Seoungnam	Suwon
Area	58.5	141.70	121.01
Residential Area	14.42	17.89	35.66
Urban Park Area per Person (m^2)	2.0m^2	7.42m^2	4.5m^2
Children's Park catchment	7.70 *1 (53.40%) *2	5.89 (32.92%)	4.47 (12.54%)
Close-by Neighborhood Park catchment	2.09 (14.49%)	2.14 (11.96%)	29.59 (82.98%)
Walkable Neighborhood Park catchment	3.30 (22.88%)	6.72 (38.68%)	14.83 (41.59%)
	Total 9.08 *3 (62.97%) *4	Total 9.57 (53.49%)	Total 30.06 (84.30%)

1 Areas of catchment of each type of parks in each city.
2 Above area as the percentage of residential area of each city.
3 Sum of residential area inside any one of the catchments.
4 Above area as the percentage of residential area of each city.

Note: Areas do not add up to the total because overlapping areas have been counted only once.

Discussions for URBIO Workshop

- Do cities with more urban parks, more evenly distributed, have greater biodiversity in Korean cities, and also in other parts of the world? We need comparative studies for Korean cities and also other world cities.

- If urban parks are located human walking distances (approx. 500m ~ 1000m) apart, is it too far away for many wildlife, or close enough? How do we promote connectivity among urban parks?

- Do we need to change legal requirements and guidelines (in Korea, and other nations) for urban parks in order to increase urban biodiversity? If so, what changes?

2

Green Roof Habitats

Green Roof Habitats

- Increasing number of greenroofs are built in Korean urban areas.
- Seoul City subsidize 50% of costs, up to 90,000 Korean Won (approx. US$80)/㎡ for extensive type green roof, and up to 108,000 Korean Won (approx. US$95)/㎡ for intensive type green roof. Some other cities or provinces follow this greenroof promotion program.
- There are also increasing number of researches on the various benefits of those greenroofs. We still need more researches on greenroof benefits for increasing urban biodiversity.

Fig. 2. Greenroofs in Seoul city, and Busan city, Korea


405
403
405


403

Discussions for URBIO Workshop

- Do greenroofs provide urban habitats for more flora and fauna diversity? How much?
- What relationships and exchanges, in terms of biodiversity, the greenroofs have with nearby green spaces?
- How do the designs, uses, and maintenances of greenroofs affect biodiversity on them?
- Are the greenroofs good stepping stones?

3

Environment friendly building certificates

Environment friendly building certificates

- Buildings that get green building certificates are given tax incentives.
- Among many items including better insulations, water saving devices, rain water coll ections, and others, biotopes are given credits for the certificates.
- The biotopes need to meet several to a dozen conditions to be acknowledged as bioto pes.

Fig. 3. Aquatic biotope (left) and terrestrial biotope (right) examples

Discussions for URBIO Workshop

- How much do these biotopes help keep urban biodiversity?
- Are the aquatic biotopes maintained properly year round? Depth and quality of water?

4

Cheonggyecheon stream restoration project

Cheonggyecheon stream restoration project

- The restoration works were completed in December 2005 at the cost of 357.7 billion Korean (US$340 million) for the length of 5.8 km.
- Clean water is supplied by pumping up water from Hangang river. Daily water supply is approx. 120, 000 tons. Stream depth is about 40 cm. It needs two 450 horse power pumps (Only one pump is operated during night times).
- Water is treated by UV for its quality. Electricity bill is approx. 7 billion Korean Won or approx. US$ 0.6 million per year.

Fig.4. Cheonggyecheon stream in 1965, and 2003 beginning restoration works

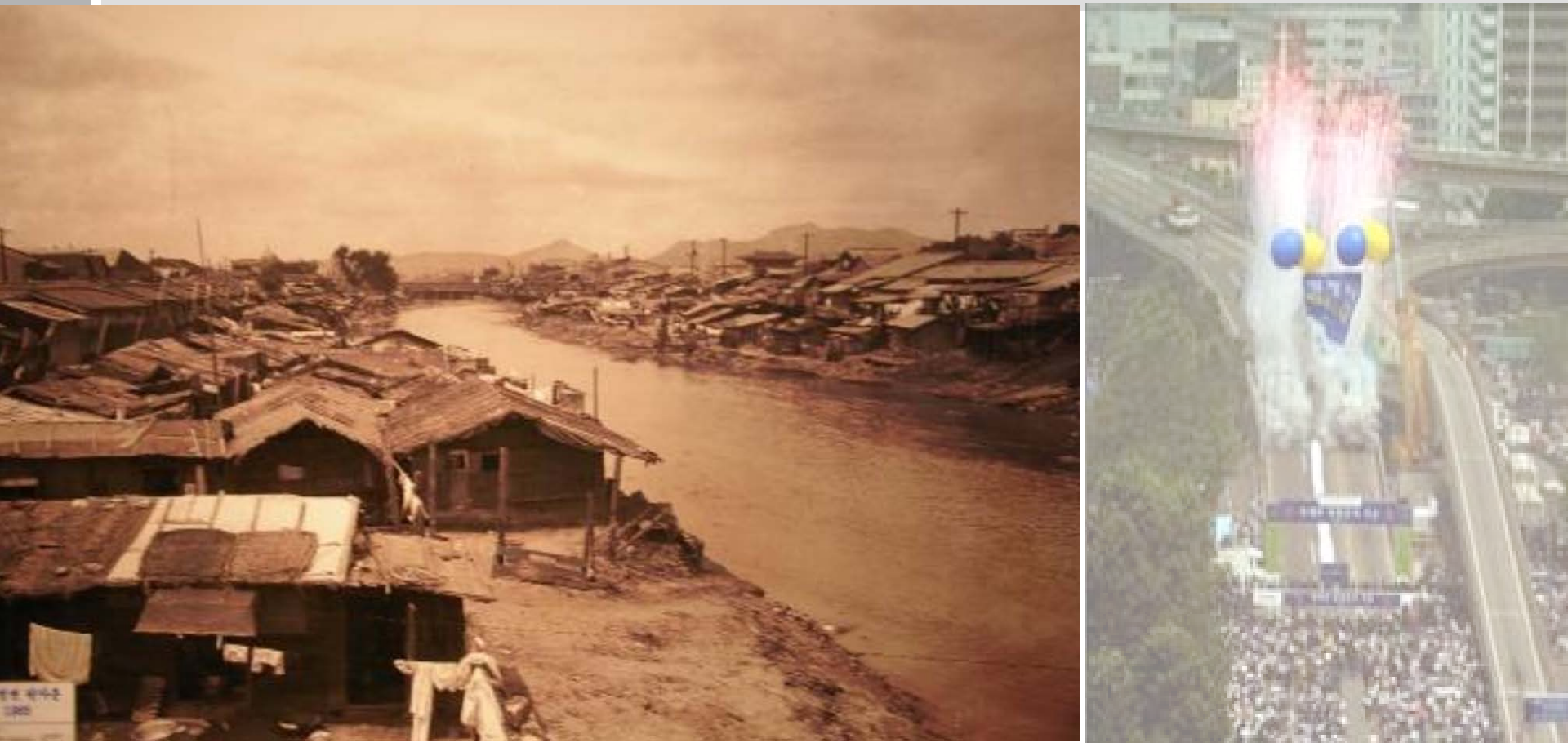
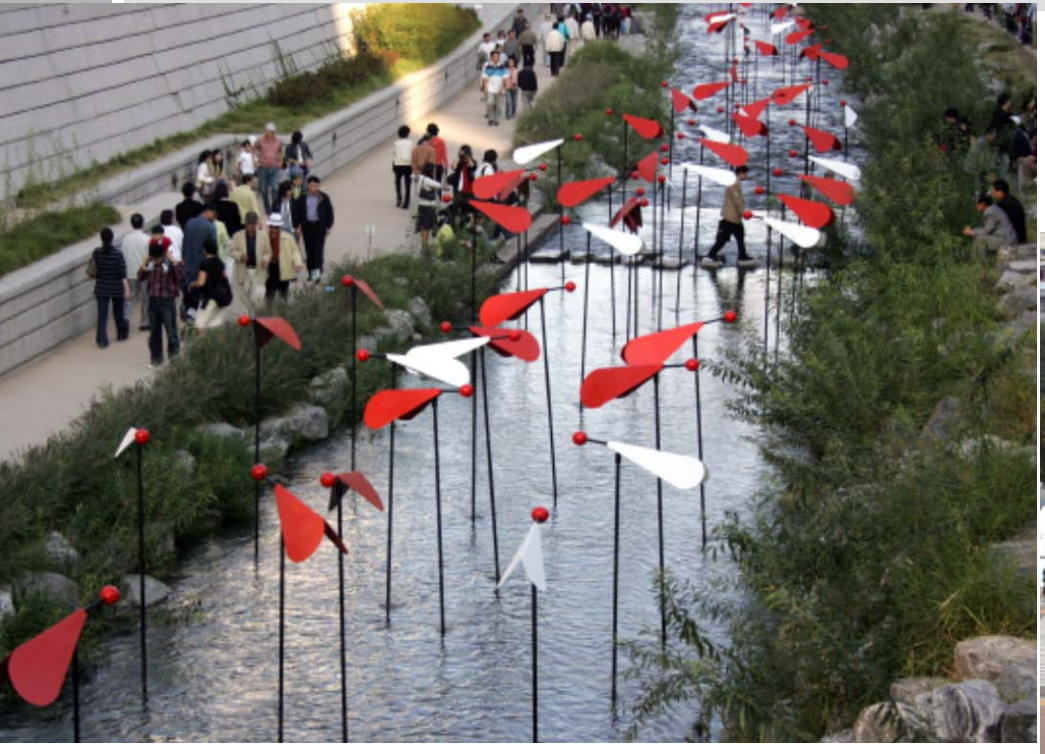


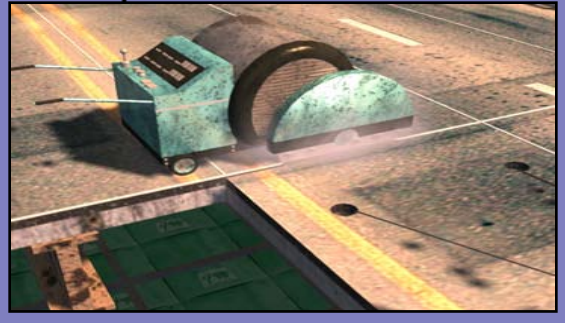
Fig.5. Cheonggyecheon stream restored



❑ Process of Demolition

- Step 1

- Step 2



- Step 3

- Step 4

- Step 5

❑ Design Criteria

- Combined sewage system for rainfall and waste water
- Capacity : 3 times of planed sewer

❑ Combined Sewer System

❑ Thematic Places

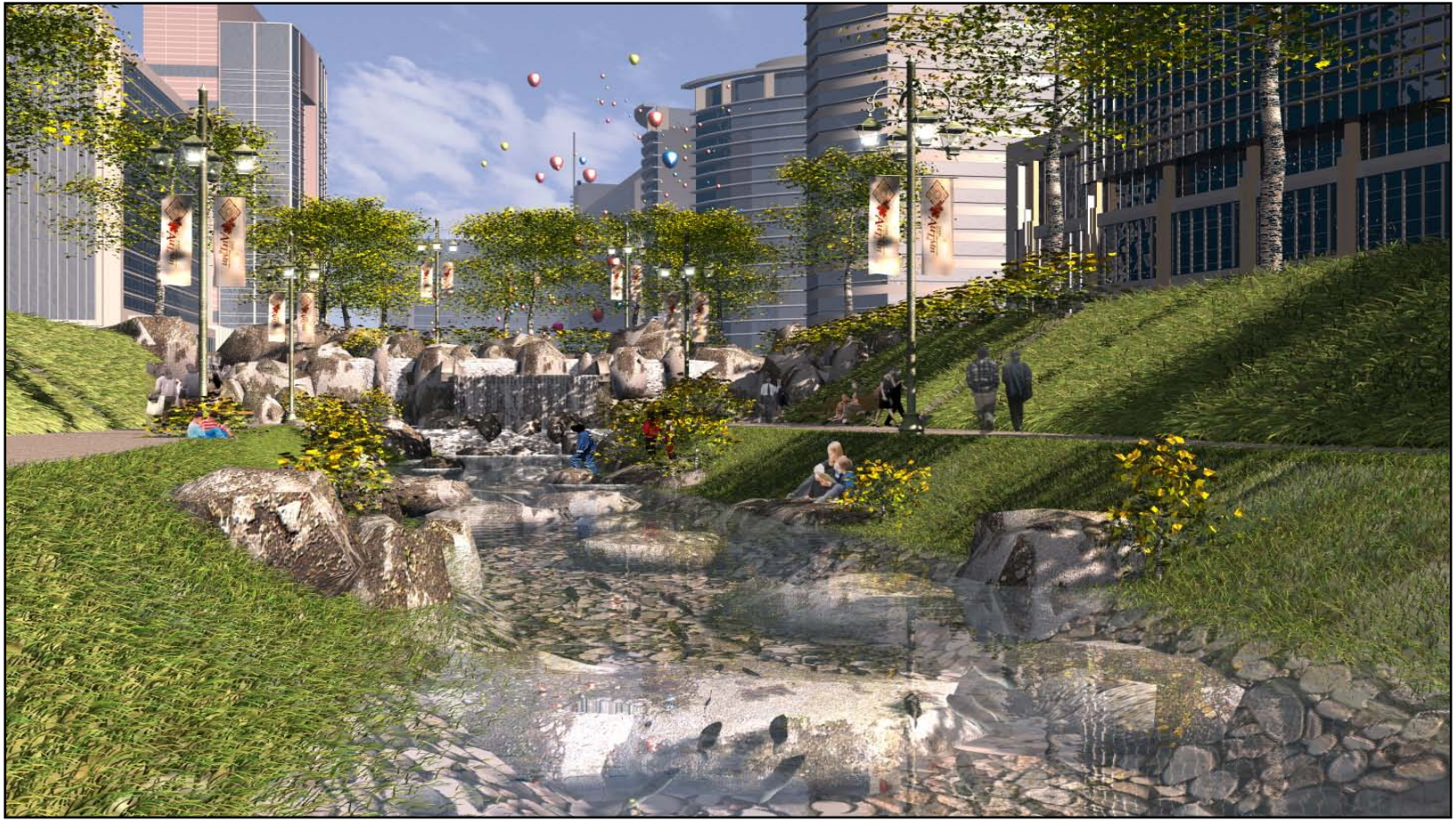
Traces of the past Cheonggye-cheon

Willow marsh

Stone plate for clothes washing

Resting places

❑ Example of the Beginning Area Design



❑ Example of Lighting Design

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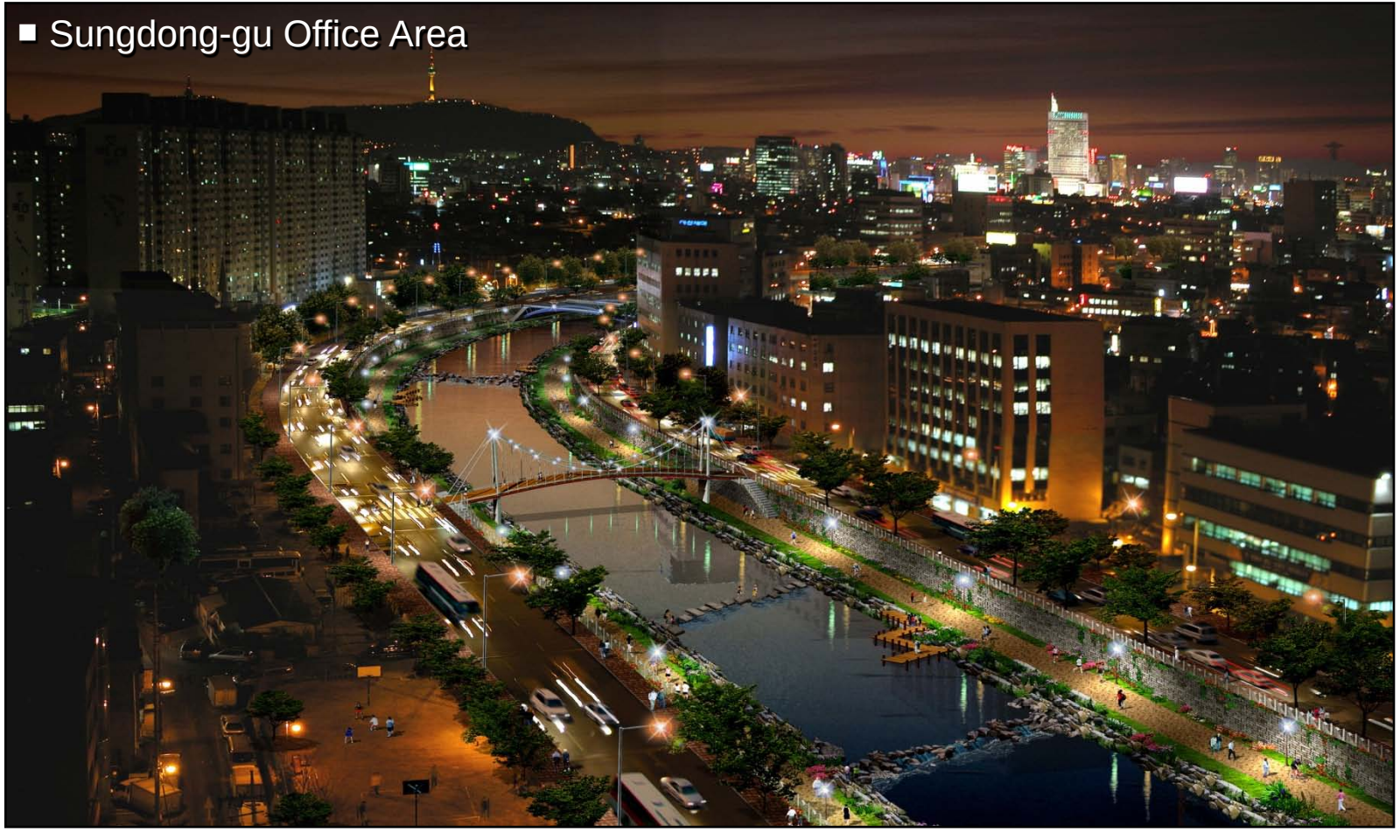
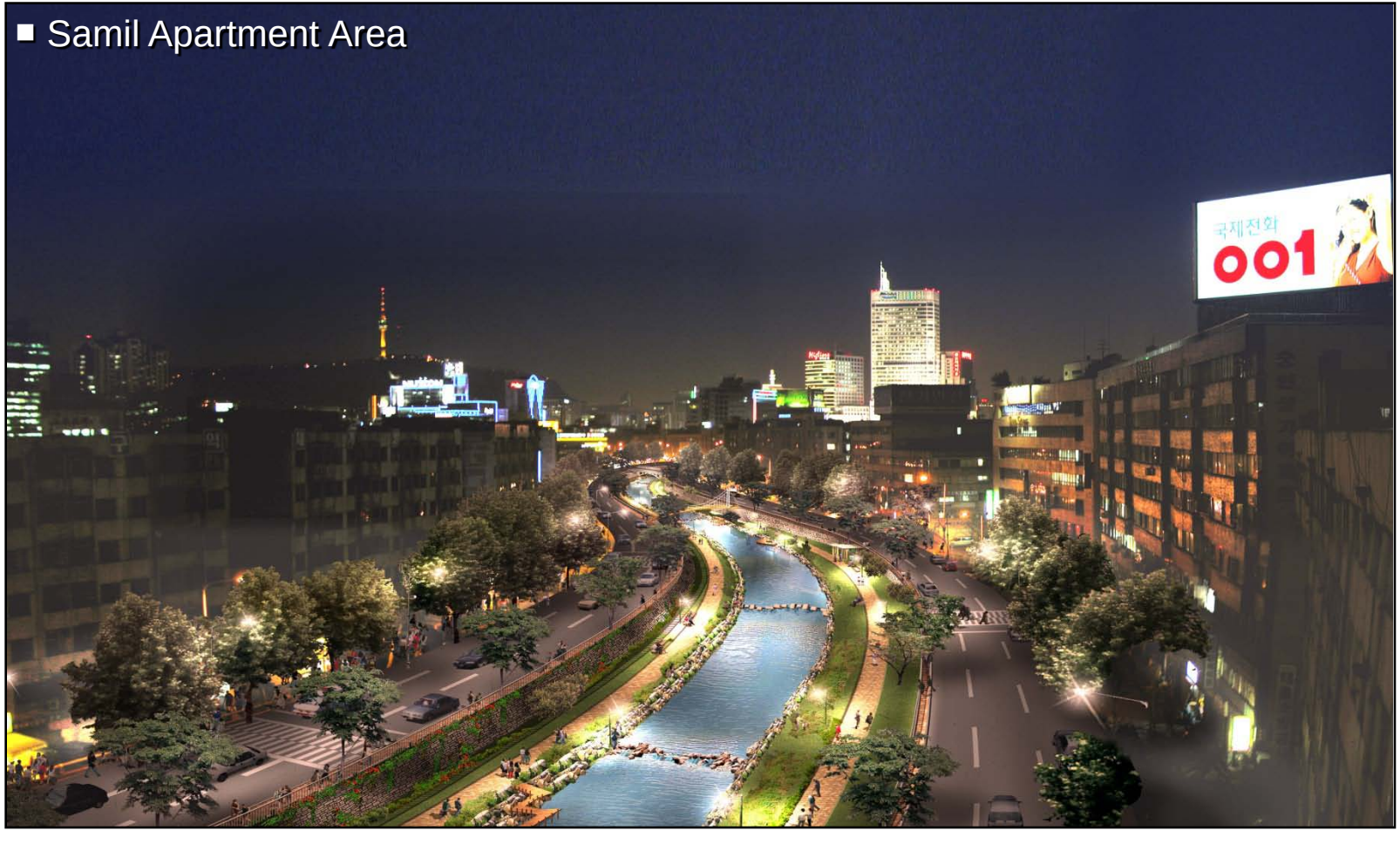


❑ Example of Lighting Design

- Samil Apartment Area



9. Lighting Plan

❑ Example of Lighting Design

- Dongdaemun Market area

Discussions for URBIO Workshop

- Is the restored stream a good habitat help increasing Seoul's biodiversity?
- How does this linear habitat help wildlife migrate?
- How do we compare this restored habitat with other similar size natural stream?
- Can we improve the retaining walls on sides of the stream and make the stream a better habitat?

5

Green network plan for new national capital city (Sejong city)

Green network plan for new national capital city (Sejong city)

- The Sejong city is a planned circular city with huge urban green space in the middle.
- A series of inter connected green spaces are also planned among the circular urban d evelopments.
- Some wildlife passages or ecobridges are planned and being built.

Fig.6. Sejong city plan(left), ecobridge under construction(right)

Fig.6. buildings connected by contiguous greenroofs

Discussions for URBIO Workshop

- How does a planned new city on green field like Sejong city affect biodiversity in t he area?
- May the new city benefit from ecotone effect eventually and have greater biodivers ity than the natural area there before?
- How much biodiversity will the central open space have?
- Will the network of contiguous greenroofs be good connections between central o penspace and surrounding greens outside of the city?
- How functional will the ecobridges be?

6

The other topics

Biotopes

[Backhyun] [Dongbaek] [Dongmak]

Ecological rivers in cities

Seoungbuk river in Seoul

Yangjae river in seoul

Natural restoration in urban areas by Ministry of Environment in Korea

- In urban areas, Korean ministry of environment initiated to establish ecological park called “Natural madang”(Twenty places will be made after 10 years) and ecological playgrounds(One hundred ecological playgrounds will be made in urban areas until 2017).
- Madang means the area where various activity can be happened, it was first used to describe Korea’s open space area inside of traditional house.
- The objective of “Natural madang” is to build ecological restoration site in cities that can be used for development of ecological restoration techniques and for climate change monitoring.
- Various of companies dealing with ecological restoration and climate change were participated in these projects.
- It was started by the law of repayment by environment collaboration aiming to ecosystem conservation and restoration in case of development project needing environment impact assessment.

Natural Madang projects

- The project started in 2012, it is now being under construction
- Total of 20 sites will be constructed, in ten years. The Ministry of environment is planning to invest 100 billion korean won.
- Seoul Project contains several ecological restoration techniques:

Implemented ecological restoration technique	Contents
Ecological revegetation	-planting nearby natural species, potential species -consider carbon sequestration -stratified vegetation planting -observation and monitoring of natural succession
Purification wetland	-non point pollution purification -monitoring the function of dry wetland -proving diverse habitats to increase biodiversity
Environmental friendly trails and decks construction	-considering natural ground form -easy to workable sky decks -observation area for canopy vegetation analysis in forest
Education and resting facilities	-developing education program related to environmental issues. -introducing environment friendly facilities

Natural Madang Project in Seoul(2012)

Natural madang Projects in Busan(2012)

Natural Madang Project in Daegu(2012)

Discussions for URBIO Workshop

- Do regulations for supporting ecological restoration businesses including relevant expertise and company are required?

- How an effort for urban ecological restoration can be accelerated?

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