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# **Soul and Soil of Seoul,**

## **about landscape as a tool to identity and sustainability**

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#### ABSTRACT

The present paper is based on the student studio *Urban Open Space* at Seoul National University's Graduate School of Environmental Design, fall 2009. Participating students were: Cho Weerae, Jin Bailian, Kim Hyojin, Lee Myungjae, and Park Mina. The goal of this studio was to discover tools for a sustainable design of urban open space, based on ecology and on slow life; results are evaluated in this paper.

The landscape of western Seoul can be analyzed as a system of Mountains, Rolling hills, Valleys, River terraces, and Fluvio-marine plains. To see how this analysis, and the landscape system itself can be made to reinforce the city, and how landscape-architectural strategies for sustainability can be developed, a test case was set up. Sustainability is then found in design that endeavors to reinforce the urban setting, making use of the natural ecology of the landscape system as it functions in soil, water and vegetation. The use and enjoyment of the urban setting by humans is, on top of this, strengthened by design with a sense of place, or design for identity, which makes use of the older occupation patterns of the landscape system. Using the data from the landscape analysis, urban open space can be developed in city planning, as being part of a comprehensive system of landscape. Urban open space extends and connects to the regional scale of the river Han and the mountain chains north and south of Seoul. The greenway proves to be a successful design strategy, as it connects. Pilot projects by students show how landscape architecture can improve identity and sustainability, based on such a landscape analysis.

#### Keywords:

Landscape analysis, Seoul, greenway, identity, sustainability

## **1. Introduction: Landscape and the City**

A city is an occupation pattern that sits on the substrate of a landscape. In our case, landscape is a system defined by soil, water, topography, potential vegetation, and patterns of earlier human occupation. Landscape seen as such a natural and historical system, contains clues for developing sustainability and identity in the urban environment.

Older cities in particular, such as Seoul, have a history of occupation that is still readable for its original connection with the natural landscape. Favorable parts of the landscape, such as in Seoul the rolling hills, were a good place to live and still form the core of the city. Flood plains along the river Han were in earlier days, of course, not used for building settlements, but were developed more recently with ample economic resources. In the modern city the flood plains are still readable as the large parapet walls of more recent apartment blocks along the river Han.

With increasing technological means, natural parameters have become less important, but they are never absent. Economic resources are required to maintain the urban landscape: the more artificially it is built, the more resources are needed for its maintenance. Reversing the argument it ultimately means that we can not sustain such efforts of maintaining our cities. Therefore, the landscape under today's modern city needs to play its role and called in to improve the sustainability of the urban system. And more than that: if it is readable, understandable, usable, and enjoyable, it brings back identity and a sense of place as well.

## **2 Landscape analysis**

On a regional scale, Seoul is framed by two mountain chains, cut by the river Han. The present study identifies the structure of the landscape of western Seoul on the basis of soil maps. These are interpreted to identify a system with six component parts: Mountains; Rolling hills; Valleys-alluvial plains; Valleys-terraces and fans; River terraces; and Fluvio-marine plains [Fig.1].

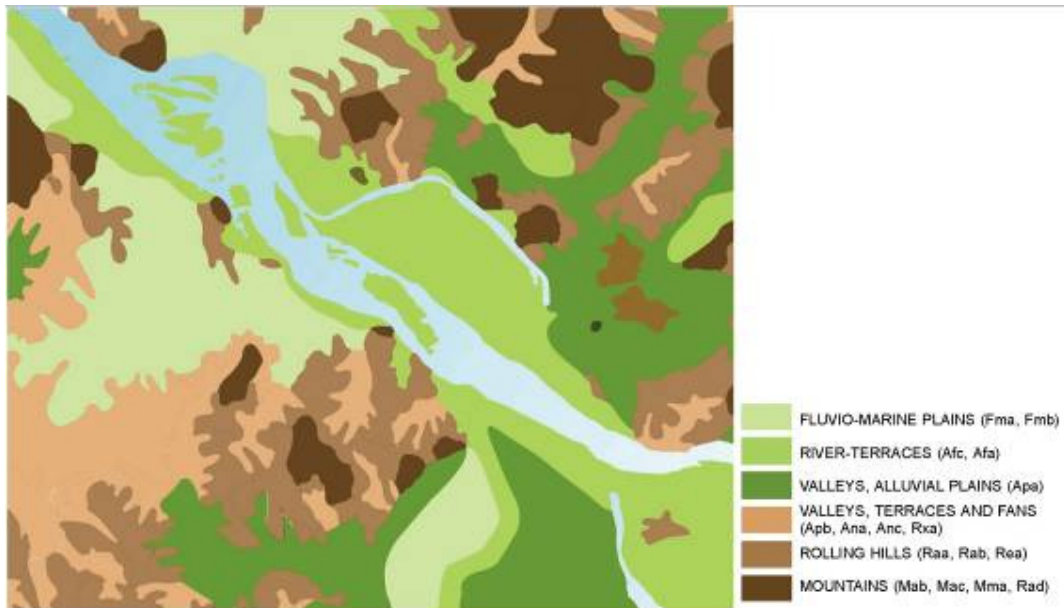


Fig.1 Component parts of landscape derived from soil maps

Each landscape part has typical water characteristics. To give an example: the Fluvio-marine plains are wet and swampy; in the resilient soil, natural streams were always easily adapted to human needs and made into canal systems for drainage and irrigation often of geometrical design, managing the water for large-scale rice cultivation [Fig.2].

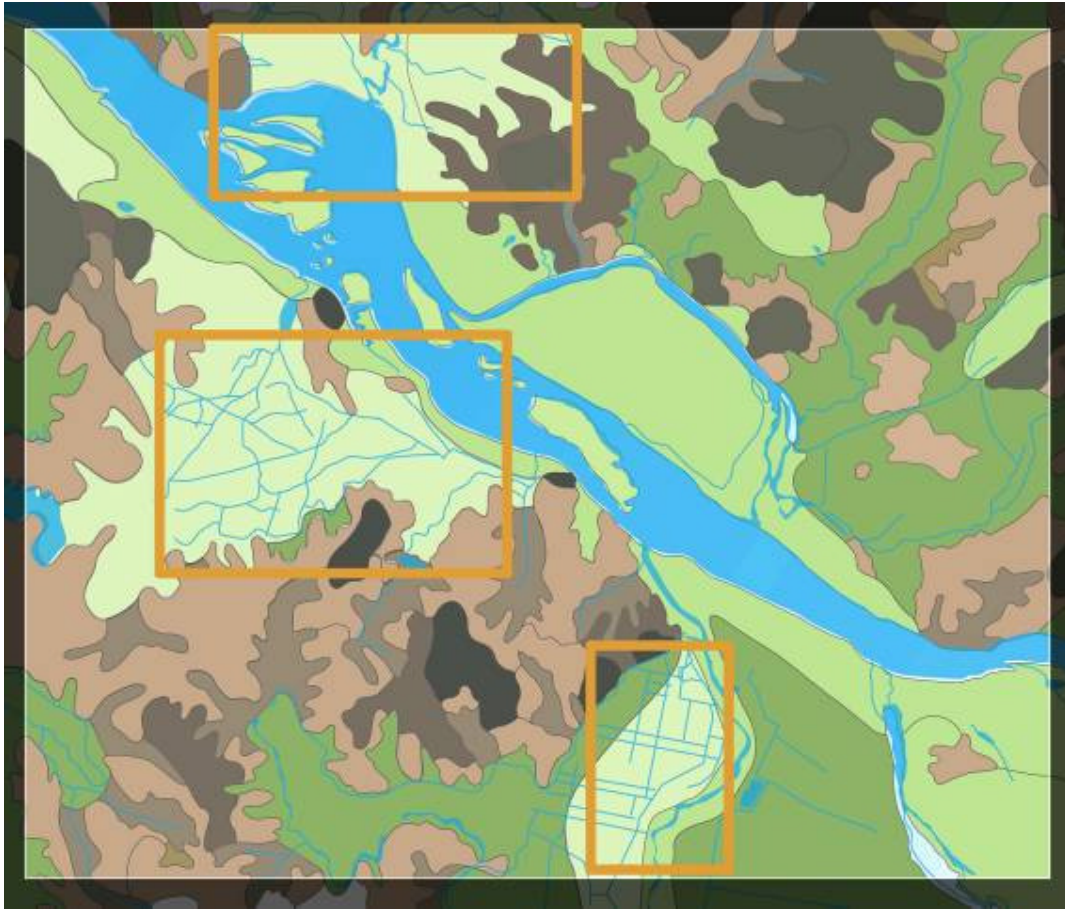


Fig.2 Fluvio-marine plains had a partly man-made system of canals

<b>Table 1</b>	<b>Trees</b>
1	<i>Quercus acutissima</i>
2	<i>Quercus serrata</i>
3	<i>Quercus variabilis</i>
4	<i>Quercus dentata</i>
5	<i>Lindera obtusiloba</i>
6	<i>Rhus trichocarpa</i>
7	<i>Prunus sargentii</i>
8	<i>Pinus densiflora</i>
9	<i>Juniperus rigida</i>
10	<i>Castanea crenata</i>
11	<i>Symplocos chinensis for. pilosa</i>
	<b>Shrubs</b>
1	<i>Zanthoxylum schinifolium</i>
2	<i>Ligustrum obtusifolium</i>
3	<i>Lespedeza bicolor</i>
4	<i>Rosa multiflora</i>
5	<i>Styrax japonica</i>
6	<i>Indigofera kirilowii</i>
7	<i>Corylus heterophylla var. thunbergii</i>
8	<i>Lespedeza maximowiczii</i>
	<b>Herbs</b>
1	<i>Carex lanceolata</i>
2	<i>Aster scaber</i>
3	<i>Oplismenus undulatifolius</i>
4	<i>Pteridium aquilinum var. latiusculum</i>
5	<i>Carex humilis</i>
6	<i>Artemisia keiskeana</i>
7	<i>Spodiopogon sibiricus</i>
8	<i>Atractylodes japonica</i>
9	<i>Pyrola japonica</i>
10	<i>Isodon inflexus</i>
	<b>Vines</b>
1	<i>Smilax china</i>
2	<i>Cocculus trilobus</i>
3	<i>Pueraria thunbergiana</i>
4	<i>Parthenocissus tricuspidata</i>

Each landscape part has its own potentials for developing natural vegetation. Mountains will develop oak and pine tree forests. The rolling hills, to give another example, will have a richer, mostly deciduous forest; traditionally, most of it was under arable cultivation, with some secondary village forests. Unambiguous data about the potential, natural plant ecology are not easily established. Research deals with existing situations, whereas we as landscape architects were rather interested in future, imaginary situations, something that can not be constructed scientifically. However, from a rather rough idea of existing vegetation, a selection of plants for possible vegetation could be made for most of the landscape parts of our analysis. From the known plant communities in comparable landscapes, whether natural or semi-natural, plants were chosen that have edible fruits, conspicuous flowers, or other values that are appreciated in landscape design. These plant lists serve as a guideline for design. For example, mainly distributed on north slopes,

halfway up, in dry soil, we usually find the *Quercus acutissima-Quercus serrata* community. Choosing interesting species from this community we get a list as given in Table 1.

Occupation history gives further clues. Rolling hills and valleys came in occupation early: villages and small scale agriculture developed in complex, and small scale patterns on this rolling landscape of the foothills.

Paths followed contour lines. In many cases a village forest was found close-by, although in the mid 20<sup>th</sup> century already many village forests had disappeared; whole hills were inhabited, as one was free from flooding as well [Fig.3].



Fig.3 Nokbeon, a hamlet on a hill in 1957, now a subway station (Photo Lee Hyongro, National Museum, Seoul)

Still, landscape dynamics are rather low, and the identity is high when compared to the plains along the river. Many landmarks in the human mind, like centers of villages, or old footpaths were found on the rolling terraces and in the valleys. The lower edge of the rolling hills and terraces was a zone where human activity became concentrated [Fig.4].



Fig.4 Built-up area, houses, roads and paths concentrate at the lower edge of the hill (1950)

Today, these are not anonymous places too: many schools and universities in Seoul take up positions in the foothills of the urban landscape, many subway-stations with their concentrations of leisure and commerce are found here, perhaps also because the granite is easily tunneled [see Fig.3]. The rolling hills and valleys form an important identity-core of the city.

The fluvio-marine plains were in use as rice paddy with a dynamic ecology, being flooded now and then, and reworked every year. Later in the developing city the fluvio-marine plains and river terraces as well, were heavily developed during the city's explosive development from the 1970s on. Land was easy to achieve in large lots, and developed often with mass-produced, anonymous apartment blocks. Cheaply bought, easily developed, in the modern city too, the plains and terraces along the river retain the short-term dynamics as they had under rice cultivation. But the ecology of agriculture has now shifted to an urban dynamics that has, seemingly, less

to do with natural ecology. Nevertheless in the mass-produced apartment blocks one still may sense a river-influenced ecology [Fig.5].



Fig.5 The healthy growth of trees, like *Metasequoia*, *Populus*, etc. betrays the abundance of fresh, subsoil water, under the parapet-walls of the apartment blocks along the river Han.

### 3 Greenway Case Study

To test the feasibility of a design approach based on a landscape analysis as above, a case study was set up, to see how the original landscape system of Seoul can reinforce urban open space.

Linear open space seemed most interesting as it may support ecological gradients as a quality of space. While passing through the changing landscape, linear open space may reveal shifts in identity, and increase recognizability. Connecting remaining patches that were linked in the past, time is better linked with space.

In the test case we wanted to cover the whole landscape of Seoul, from the northern mountain range to the southern. Practically speaking this takes shape as a greenway running north-south, from the foothills at Seodaemun



to the foothills at Sinwol, in western Seoul [Fig.6]

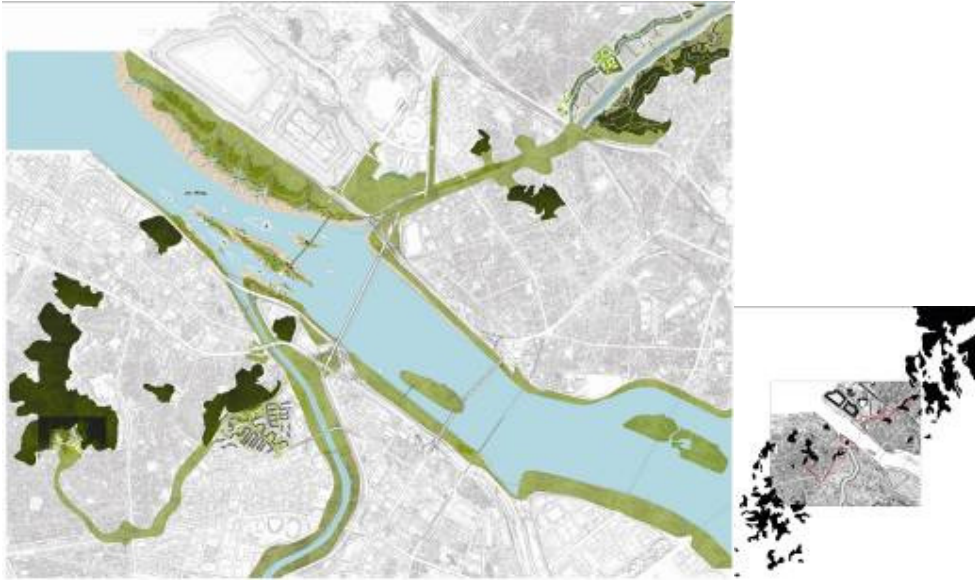


Fig. 6 The proposed greenway connects two mountain chains

Much of today's thinking about the larger planning of Seoul centers around the river Han. In passing, our greenway proposal tests the landscape perpendicular to the river Han too, establishing a greenway that connects the two mountain systems, north and south of Seoul. The river Han cannot be seen as an isolated element, it forms part of the larger system of landscape on a regional scale.

Greenways work as an ecological corridor, and can be made to fit slow traffic systems perfectly. They pose the alternative of the bicycle to commuter traffic by car, and can for example connect high density nodes at stations. Small scale transport systems, such as garbage recycling by barrow, or retail by pushcart, also profit from the greenway. Slow traffic in general generates improvements in sustainability as it is productive without consuming mineral oil.

The assumption was that it would be possible to eliminate some built-up area, and sacrifice it to increase identity and sustainability of the neighborhood as a whole. The assignment was therefore to find first of all the characteristics of the landscape of the neighborhood, by referring to the analysis and secondly to erase these parts of the built-up area that give most

result when redeveloped as part of a greenway for improving sustainability and enlarging the identity of the neighborhood. This is best illustrated with some examples.

### 3.1 Case: Mountains and Rolling Hills

The city has developed growing uphill, even entering the mountains; the result is a loss in clarity. Steep, narrow streets without any specific quality hide the readability of the landscape. Noticeable though in the street scenery is the sudden change in steepness, where rolling hills abut the mountain. The proposal is to erase part of the built-up area on the mountain. This exposes better two Buddhist temples, traditionally at the entrance of the mountain. The entry to the forested mountainside becomes clarified at a point where a stream leaves the mountain and forms a narrow valley. This valley is now used as vegetable garden. The proposed, cleared area gets the same function of urban farming [Fig.7].

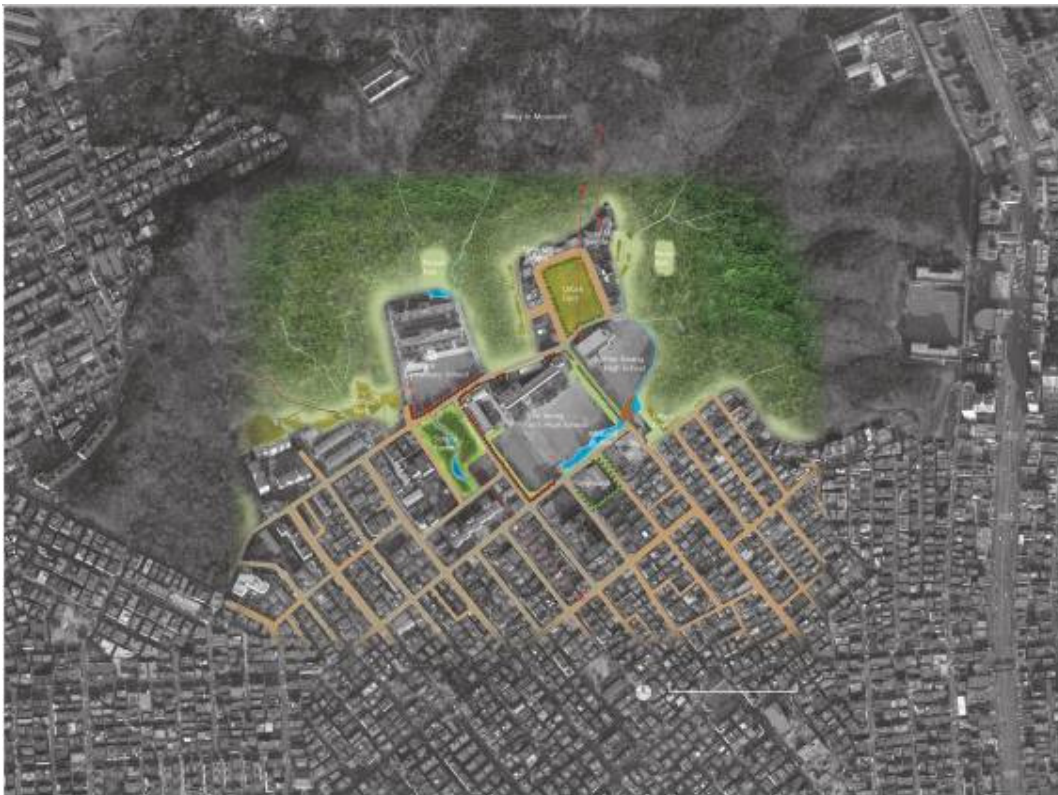


Fig.7 Recognizability of the mountain improved, neighborhood gardening encouraged

Quite some schools are found in this area. Neighborhood streets should be developed as a network for walking, or going by bicycle to school. Along these routes, narrow streams will carry water from the mountain in the rainy season. Part of the school grounds are redone to become water buffering areas, including a school biotope for studying nature. Suggestions for planting design follow the guidelines of our vegetation analysis.

### **3.2 Case: River and River Terraces**

The analysis of the history of the river Han shows, as can be expected, high dynamics, with ever changing courses for the main water thread, and changing topography of the shores. River washes, and islands are appearing and disappearing continuously. The river landscape served as a sponge with a high capacity of retaining water. Presently, the shores are concrete embankments with fixed flood plains that serve to discharge water at peaks. Technically speaking the river is in control. For the landscape though it means that the connection of the river with the rest of the surrounding landscape has decreased significantly. For the natural ecology it means that gradients are missing, although cosmetic efforts, like bringing in wetland zones, show that planning policies are changing in the right direction. For humans the river has become a meaningless gutter that is moreover too wide to be crossed, other than by means of fast traffic. Needless to say that fast traffic does not give a real experience of the river.

Bringing back slow traffic to the river and increase sponginess were the keys to designing the greenway over the river. Moreover inspiration was found in temporary floating structures in past and present that are and were used for all kinds of activities, like fish farming, or a floating restaurant [Fig.8]. Ideas on planting design are based on the natural plant communities along the river as discovered in our vegetation analysis.



Fig.8 The river Han becomes part of the city's urban open space

### 3.3 Case: Fluvio-marine plain and Rolling Hills

Massive high-rise apartment blocks remain, in spite of efforts in landscaping, a rather anonymous place. In this case, the edge of the development, where it touches upon rolling hills, was redone. Some apartment blocks were removed. In the new area the existing hollow of the hills was reinforced to become a neighborhood park with entrance to the hill. It is here that water comes out in the rainy season - it is drawn into the neighborhood in a system of smaller canals [Fig.9].

Planting design follows the guidelines of our vegetation analysis.



Fig.9 Canal systems of the fluvio-marine, suggested by streams that find their spring at the edge of the rolling hill

### 3.4 Case: Valley – alluvial plain, and Rolling Hills

The alluvial valley drains with a canal that is now enforced with embankments. While working on its redesign, a remnant landscape structure of an earlier stream bed was discovered. This is redesigned as a local neighborhood greenway. Reworking the main canal, it was made to connect with the edge of its natural valley, the edge of the landscape of rolling hills. Use was made of remnant parts of blocks of today's urban setting to evoke the idea of village forest that has hamlets. In the reality of contemporary urban real estate these can be understood as high quality, expensive urban villas. Nevertheless, the rest of the village forest should be (semi-) public space for everybody's use [Fig.10].



Fig.10 The edge of the rolling hill is restored at the main canal. The neighborhood is reinforced with restoring a second and older water thread

#### 4 Conclusion

The present paper proposes to introduce the original systems of landscape as an inspiration and guideline to redevelop the urban environment towards more sustainability. Design of urban open space should refer to the system of the original landscape, to the soil and soul of a city; then, an ecological sustainability of the natural systems of the urban fabric can be enhanced, and the readability of the occupation history too. A sense of place, the identity - what could be called the psychological sustainability - is improved as well. This way of thinking about landscape and city planning, poses an important task, with responsibilities, for the landscape architect.

## 【References】

- [1] Map: Institute of Plant Environment, Office of Rural Development (1971), Reconnaissance Soil, Seoul
- [2] Map: Institute of Plant Environment, Office of Rural Development (1977), Detailed Soil Map, Seoul
- [3] Map: Environment Administration (1989), Actual Vegetation Maps, Seoul, (現存植生圖)
- [4] Map: Army Map Service U.S. Army, Washington D.C. (1950), Series L751, Sheet 6526I, Kyongsong, Map 1:50,000
- [5] Dolezal, J., Jong-Suk Song, Jan Altman, Stepan Janecek, Tomas Cerny, Miroslav Srutek, and Jiri Kolbek (2009), Tree growth and competition in a post-logging *Quercus mongolica* forest on Mt. Sobaek, Korea, *Ecol Res* 24: 281-290
- [6] Généro Cité, généreux vs. générique (2008). Participation de la France à la onzième Exposition internationale d'architecture de Venise, Co-édition ACTAR/CulturesFrance
- [7] Jarolimek, I., and Jiri Kolbek (2006), Plant communities dominated by *Salix gracilistyla* in Korean Peninsula and Japan, *Biologia, Bratislava* 61/1: 63-70
- [8] Kamada, M., and Nobukazu Nakagoshi (1993), Pine forest structure in a human-dominated landscape system in Korea, *Ecological Research* 8: 35-46
- [9] Kim, Jung-Un, and Bong-Seop Kil (2000), The Mongolian Oak Forest in Korea-Environment, Vegetation and it's Life, Wonkwang University
- [10] Kim, Kee Dae, and Eun Ju Lee (2005), Potential Tree Species for Use in the Restoration of Unsanitary Landfills, *Environmental Management* 36/1: 1-14
- [11] Kim, Kwi-Gon (1996), Urban ecology applied to the city of Seoul implementing local agenda 21, UNESCO/MAB
- [12] Korean Soils Information <http://asis.rda.go.kr/> (most in Korean language section, see Excel files after registration for research use)
- [13] Lee, Dowon [ed. et al.] (2002), Ecology of Korea, VIII INTECOL International Congress of Ecology, Seoul, Korea: Bumwoo Publishing
- [14] Lee, Eun Bok (1997), Actual Vegetation and Potential Natural Vegetation of Pukhansan National Park, Mid-western Korea, *Korean J. Ecol.* 20/6: 439-450
- [15] Ministry of Environment (1988), '88 自然生態系 全國調查(II-1) 第三次年度 (서울京畿의 植生), Ministry of Environment, Korea
- [16] Song, Jeanhwa, and Yukio Nishimura (2006), Urban open-space plan for a sustainable city: Application to the Tokyo area, University of Tokyo, 12th International Planning History Conference, New Delhi, 2006-12-11-14.
- [17] Steemers, K. (2003), Energy and the City: Density, buildings, and transport, Energy and

Buildings: 35/1: 3-14

[18] Takeda, Y., Satoshi Nakanishi, and Dumun Choe (1994), Phytosociological study on natural summer-green forests in Korea, *Ecological Research*, 9, 21-32

[19] Yim, Yang Jai, and Keum-Chul Yang (1998), Vegetational Changes of Mt. Nam Park, Seoul, *Korean J. Ecol.* : 21/5-3: 589-602

### **Resume**

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