# Ubiquitous Eco-City Planning in Korea. A Project for the Realization of Ecological City Planning and Ubiquitous Network Society

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## 1 ABSTRACT

This paper intends to give an overview of the project "Ubiquitous Eco-City Planning in Korea," which is financed by the Ministry of Land, Transport and Maritime Affairs. With the aim to advance the regulations for the planning, construction and management of the Ubiquitous City and to create a ubiquitous city model, the 'Act on Ubiquitous City Construction' became effective as from March 2008. Taking into account political, social and economic requirements, a number of Ubiquitous City projects have been accomplished. From December 2008 on, 40 cities and communities of Korea have been carrying out "ubiquitous city projects" (National Information Society Agency 2008a).

The introduced U-Eco City Project as one of the VC-10 Projects (future-oriented 10 Value Creator Projects in Korea) will last until 2012, thus for 6 years in total and having a test bed.

In the project, the ubiquitous technologies and ecological city planning will be combined in the real urban space and suggest a modern city model, which can create an innovative urbanism and future-oriented sustainable city.

First, I will introduce a general overview of the project, followed by an approach to the ecological landscape planning. As Korea has not firmly established landscape planning instruments, this project will show ways, how ecological landscape planning can be developed and how the planning and IT can be harmonized.

In reaction to the foreseeable future needs, this study aims to search for new planning approaches in order to realize the U-City under the actual circumstances in Korea. It further wants to supply a framework to execute the U-City Projects in a more structuralized and systematic manner.

In order to reach this goal, we want to firmly establish the future comprehensive planning system on the field data from the past U-City development cases and the current U-Eco City planning projects on the one hand. On the other hand we will analyze the relevant existing laws and regulations. Through this process we will be able to name the guiding concepts, features, and important factors for the planning process in Korea.

## 2 INTRODUCTION

The fast growing information and communication technologies in Korea facilitate different derivative technologies and strategies, which all use ICT in varying degrees. Among these technologies is the group of the so-called ubiquitous technologies, which are introduced partly in this paper. The rapid growth of IT and its applications in Korea is capable of improving current urban services, management and infrastructure planning. On the basis of the last 20 years of development and acceleration in the IT technologies and services, ICT makes it possible to innovate the existing industries and to connect fully different industries together or to create new industry sectors, that is, IT can act as a catalyst for divers industries and services.

In the political field, recently the nationwide project "Ubiquitous Eco-City Planning in Korea" was launched and financed by the Ministry of Land, Transport and Maritime Affairs. The project aims to advance the regulations on the planning, construction and management of the Ubiquitous City and to create a ubiquitous eco-city model. The U-Eco City Project will last until 2012 as one of the VC-10 Projects (future-oriented 10 Value Creator Projects in Korea), for 6 years in total.

In the project, the ubiquitous technologies and ecological city planning will be combined in the real urban space and suggest a modern city model, which can create an innovative urbanism and a future-oriented, sustainable city.

## 3 THE UBIQUITOUS CITY DEVELOPMENT IN KOREA

The term "U-City" emerged in the political arena first in 2004. One progressive step toward the realization of ubiquitous society is the enactment of the 'Act on Ubiquitous City Construction' from March 2008. (Kim 2008).

Ubiquitous City should combine physical, spatial urban development with ubiquitous technologies, so that the limitation on physical distance and time can be overcome and a new urban model for a sustainable, intelligent city will be developed (Kwak 2008). On the background of political, social and economic requirements, a number of Ubiquitous City Projects in Korea were completed, and now almost 40 cities and communities of Korea are carrying out 'Ubiquitous City Projects'. The Korean Government has taken an initiative to investigate the trans-industrial convergence projects using IT. The Korean Government is willing to take a leading role in the world and to fasten and consolidate its international competiveness in this area (National Information Society Agency 2008a). Meanwhile, the Korean Ministry of Information and Communication has established the U-Korea General Plan in 2006, and in the following year the General Plan for U-City construction activation.

According to the law, U-City is defined as "a city in which ubiquitous based services are offered at any time and in any place in urban space by realizing high-tech IT, construction, traffic application technologies to enhance urban life quality and city competitiveness" (Ministry of Commerce, Industry and Energy 2007).

The following picture shows which agencies have to accomplish the tasks and their role for the U-City Policy (Korea SW Industry Promotion Agency 2008).

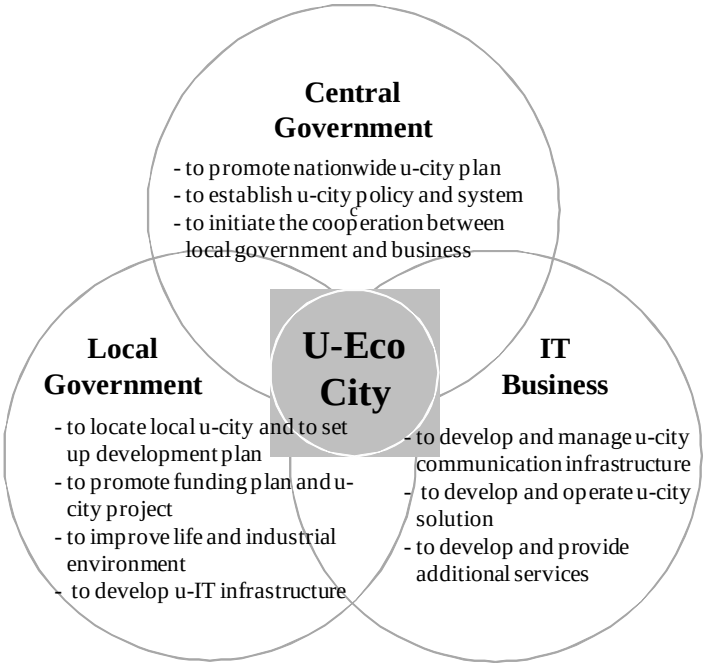


Fig. 1 The Main Body of the U-City Operation Project in Korea

The Act on Ubiquitous City Construction suggests how a ubiquitous planning system will be formed from the central government down to local city authorities. The picture below shows the hierarchical structure of the ubiquitous planning system. On the national dimension, the general plan has the character of a basic plan, including philosophy, principles, executing system, relevant laws and instruments, and the plan will be adjusted every 5 years. On the city level, the ubiquitous city plan is a general plan on the municipal level and serves as a guideline for the ubiquitous city construction projects and the implementation plan. If a city intends to make a ubiquitous city construction project with an area larger than 165 ha, the city has to complete the ubiquitous city plan before the project starts (Kwak 2008).

The ubiquitous city construction and implementation plan includes construction, management, services, financing, and a system to bring forward the project. All these plans do not come into conflict with other laws or plans like municipal general plan according to National Land Planning Act (Kwak 2008). On the other hand, there are many serious concerns about the ubiquitous policy. The lack of executive's

understanding about relevant technologies and services, resulting in budget waste due to multiple investments for the same technologies stipulates some resistance (Cho 2009). Because the ubiquitous city project is a new and innovative trial, there are many try and error possibilities as well as some other problems. One effort to minimize mistakes was the enactment of the law and the guideline for U-City infrastructure establishment (National Information Society Agency 2008b).

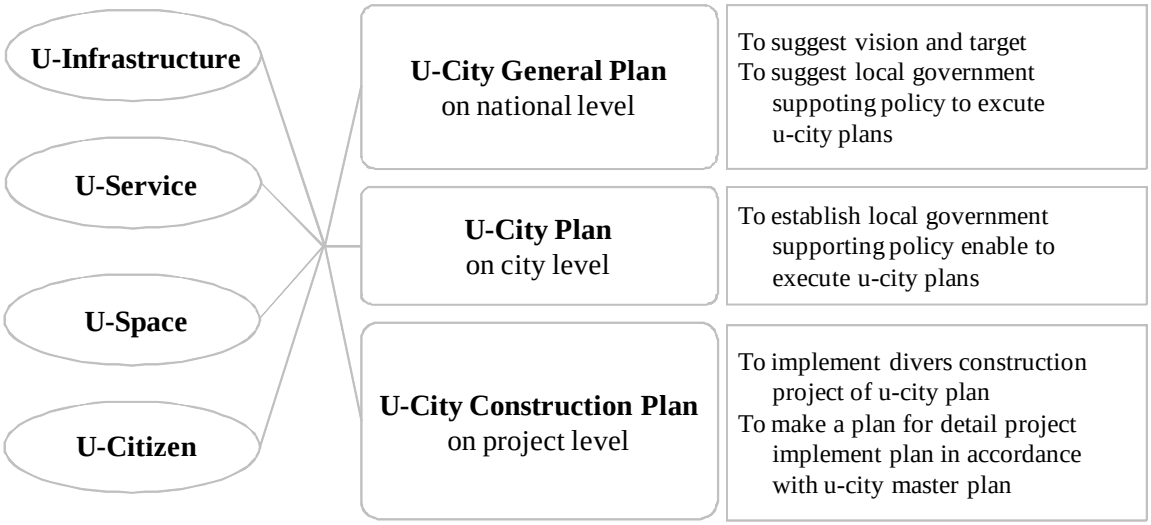


Fig. 2 U-City Planning System

## 4 UBIQUITOUS ECO-CITY PROJECT IN KOREA

While U-City first officially appeared in 2004 and spread remarkably widely in short time, eco-city movement started from 2000 in R&D projects like the G7 project or Eco-Technopia. Through the convergence of the two contents of u-technologies and ecology in cities, the U-Eco City was created in 2007. Before the launching of the U-Eco City Project nationwide, which is described in this paper, KICTEP (Korea Institute of Construction and Transportation Technology Evaluation and Planning) accomplished and published the pre-drafting works (KICTEP 2007).

With the U-Eco City Project being one of the VC-10 projects (future-oriented 10 value creator projects in Korea) , more than 50 institutions like universities, institutes, agencies and IT-Firms participate in it. The project lasts from 2008 to 2013. The U-Eco City is defined as a “sustainable future green city that produces innovative city value with integration of ubiquitous and ecology technology into city space” (U-Eco City R&D centre 2009). The main aim of the project is to construct a future-oriented, sustainable city in which city management technologies based on ubiquitous infrastructure and the ecological system are combined and will create a comfortable urban environment for urban citizen. The vision of the U-Eco City model can be summarized as follows:

- Intelligent city well equipped with information and communication
- Convenient city provided with a functionally well operating public service
- Healthy city promised with amenity and amiable life
- Secure city with effective complex operating system
- Environmental friendly city

This project is organized in five task groups and 17 theme blocks, the total investment budget amounts to □140 billion won (Government Fund: □95.9 billion won, Matching Fund: □ 44.1 billion won).

The whole project covers various dimensions, but here only the third core task, in which our research team is participating, will be presented more detailed. The task ‘U-based eco space construction’ is divided into 4 task units:

- Eco city planning, design, evaluation based on u-technology
- Construction technology of the u-water circulation system
- Construction technology based on low-energy and recycling

- Eco city construction fusion technology based on u-technology.

I want to introduce in the following chapter, how landscape planning in Korea will be integrated in the U-Eco City Project.

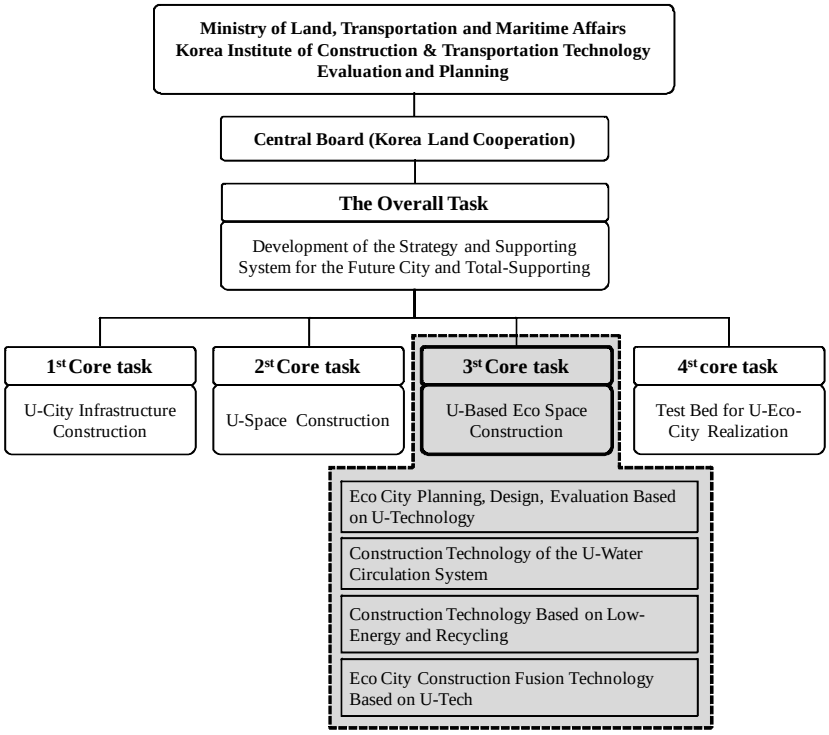


Fig. 1 Organization and Structure of U-Eco City Project (U-Eco City R&D Center 2009)

## 5 LANDSCAPE PLANNING AND U-ECO CITY PROJECT

Unlike many European countries, there is no comparable landscape planning system in Korea. The legal spatial city planning has a lot of deficits in integrating ecological aspects and needs. Such a deficit leads the Korean cities to grow and extend massively and in an uncontrolled way. Whether in the legal city planning or in landscape planning, nature conservation in the city has to be dealt more systematically and to take the form of a legal planning system. Otherwise, the unplanned urbanization and deterioration of the city would be deepending much more.

The law that enables the landscape planning at least is the 'Nature Conservation Law'. The law has some flaws in dealing with nature conservation effectively and systematically in the urban space. Firstly, according to the law, environment itself is divided into the so-called natural environment and living environment and this law is confined only to natural environment. Subsequently, the law has no significant efficacy on urban space, where natural area is scarce. Secondly, the law has not a clear regulation on the landscape planning or ecological planning in the city. The regulation on the planning is not concrete and very ambiguous. Thirdly, the task field focuses to restrictive on the conservation task, for example on the protection of nature conservation areas, endangered species or natural ecosystems etc. As a result, the non-natural areas like cities are to a great extent excluded.

In order to protect and bring nature in the urbanized area, we need to reform the above law in a way that its categorical realm reaches not only the natural area but also the urbanized area. Also the law should suggest a clear system of landscape planning, spatial extension and carry more legal efficiacy.

Being aware of such legal weakness in the planning instrument, the U-Eco City Project is aiming at developing a standard for the landscape planning in Korea. Following aims are pursued:

- to establish a general methodological approach for a landscape planning system
- to suggest the planning hierarchy
- to suggest the planning themes
- to offer ways, how the landscape planning could be combined with other spatial planning in the city.

The following figure shows the whole work scope of the sub-task team 'eco city planning, design and evaluation based on u-technology'. From data collection, analysis and assessment, the crucial information for the planning can be obtained. The whole information is used for the landscape planning on different detail level in a city, from landscape section plan to landscape design.

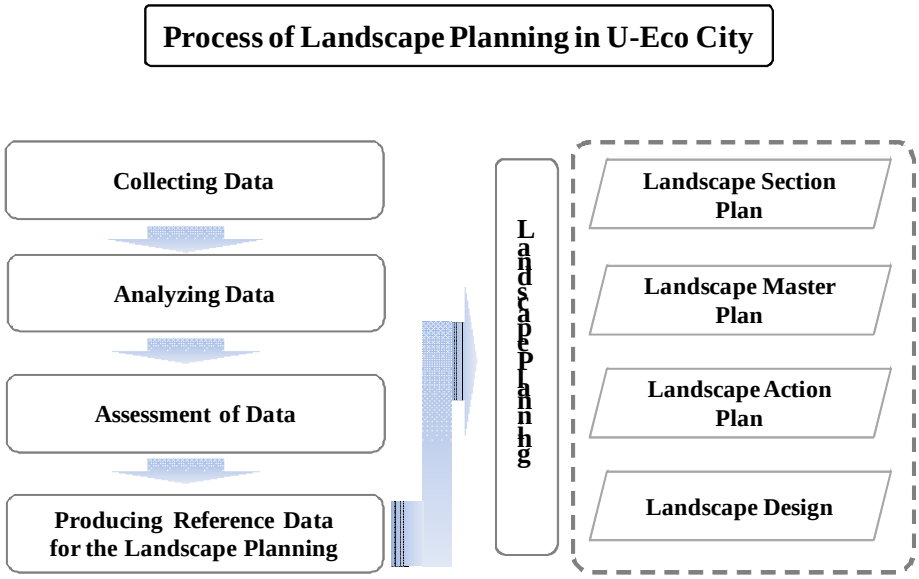


Fig. 4 Process of Landscape Planning in U-Eco City Project

In the project, special strategies will be developed on how the stark pressure to develop and construct can be integrated and controlled in the ecological landscape planning. One strategy is to introduce the competent instrument like the impact regulation in Germany.

At the moment, the project is in the starting phase and its concrete suggestions will be presented soon.

## 6 CONCLUSION

The U-Eco City is a state-financed large project, in which many scientific fields work together for several years. It can serve as a good opportunity to establish a landscape planning process in Korea and show its value to the other participating scientific partners. There has been not yet such a good chance to realize the complete landscape planning in a real city.

On the other hand, it is required to solve the difficulties of converging various technologies and concepts in the project. Because a lot of disciplines are participating, an intense interdisciplinary cooperation is needed.

The difficulty we are confronted with now is how ubiquitous technologies will be matched with ecological concepts in the city (cf. Lee et al. 2005). There has been no experience of ecological science and IT working so close together. Besides, we notice internal resistance by the participants of the totally different scientific fields.

But it can provide not only challenges but also bring opportunities for both parts of science. For the success of the project, extraordinary creative thinking and approaches are required by both sides. In the fourth project year, all adopted technologies and approaches are put together in a real city as a test bed.

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## 8 ACKNOWLEDGEMENT

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