Summaries

of Research Reports

2004

KRIHS
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National Planning and Development
The Korean Government has been propelling the Close-to-Natural River Project to rehabilitate the damaged river environment since the late 1990's. At present, there is however no rational analysis method to determine the improvement direction of each river district considering river environmental characteristics. Accordingly, this study suggests a reasonable criterion that can divides 65 National Rivers into 266 river districts. After then, it analyzes the environmental characteristics of each river district with using the single measurable index method named “Environmental Index of River District (EIRD)”.

To calculate the EIRD, 16 factors that have great effects on river environment are selected from the river's inherent environment and the Close-to-Natural-River management theories. Each factor weight is also calculated by expert survey and normalized the value of these factors by Z-Score method. After then, the EIRD of 266 districts has been calculated by the linear sum of the each multiplication of factor weight and normalized the value.

The multiple regression package, that is, SPSS is used to ensure the relationship between 16 factors and the statistical significance of analysis results. As a result of verification, 16 factors have good credibility because of the pretty low correlation. And it is showed that the EIRD has higher correlation under the conditions; water quality is getting clear, population near river district is getting lower, the scenery of district is getting better and curvature of district is getting larger. According to the general criterion of magnitude of index, it is analyzed that the necessity of conservation is higher in the case of upper 20% from the score order, while the necessity of improvement is higher
in the case of 20% from the lowest score order in 266 river districts scores. These districts are also calculated EIRD in the patterns of province, river basin and city.

According to the result of analysis, the 4th river district in Soyang River has the highest EIDR(1.003), while the 16th river district in Han river shows the lowest EIRD(-1.063). In the case of 4 stratified items, the highest EIRD in ecological environment item is 4th river district in Soyang River as 0.763. The highest EIRD in social and cultural item is 1st river district in Hyungsan River as 0.265 and the shape item is 2nd river district in Soyang River as 0.265 and water use and flood control item is 3rd river district in Dongjin River as 0.164. In the case of river including the sum of district's EIRD, the river which has the highest EIDR is Nam River as 3.294 and the lowest river is Jungryang river as -2.387. From the result of this outcome, the score of each river district EIRD can be used to decide the priority improvement order and the score of 4 items and each river's EIRD can be used to decide the direction of improvement.

This study aims to suggest development directions for the major North Korean cities in the context of inter-Korean economic integration. Based on the case study on transition economies and quantitative analysis on industrial potentials of the North Korean cities,
directions of industrial restructuring are suggested. This study consists of seven chapters including conclusions.

The first chapter discusses the background and need of the study, research objectives and methods. This chapter also briefly examines some major results of other research activities related with this study.

In Chapter 2, the prospects of inter-Korean economic integration and of direction for economic restructuring are suggested. Inter-Korean economic integration could be implemented in three stages, which are the beginning stage, the expansion stage and the deepening stage. At the beginning stage, we can prospect that North Korea will make use of the agricultural-fishery sector and labor intensive light industry for attracting foreign investments, and will foster new growth industry by bringing up IT sector. At the expansion stage, North Korea will bring up low technology and labor-intensive light industries such as fiber, footwear and toy. Partial restructuring on heavy industries will be possible in this stage. At the deepening stage, the fundamental change will happen in the course of economic reform of North Korea's industries. And labor forces will shift from the heavy chemical and munitions industry to light industries and services on a large scale in this stage.

Chapter 3 presents basic directions of industrial development in the North Korean cities. First, the positive upbringing of producer service is necessary by using geo-economic potentials. At the deepening stage, it will be possible to promote the Nampo-Pyeongyang or Rajin-Seonbong-Cheongjin linkage development as the case of Hongkong-Shenzhen shown. Second, it is necessary for North Korea to corporate positively with South Korea and foreign companies in terms of technology and investment. The corporation with South Korea's company has a special significance as the case of Shenzhen, which has a corporation with Hongkong for its industrial development. Third, industrial developments of the North Korean major cities could be connected with some infrastructure development projects in Northeast Asia such as the TKR-TSR linkage project, Asian highway project, and Siberian natural gas exploitation project.

Basic directions of industrial development in the North Korean cities could be
suggested according to the phase of inter-Korean economic integration as followings.

At the beginning stage, it is necessary to foster export-driving industrial cities and to make use of existing resources. Gaeseong, Wonsan, Shinuiju and Rajin-Seonbong have potentials for export-driving industrial cities in this stage. At the expansion stage, logistic industry and tourist development could be activated in addition to export-oriented industry in Shinuiju, Nampo on the west coast and Rajin-Seonbong, Wonsan on the east coast. At the deepening stage, it is necessary to seek a comprehensive industrial development of cities with compounding export-oriented industries, logistics, tourism, and other functions.

The industrial potential of the North Korean cities is reviewed in Chapter 4. The major findings are as followings. The conditions of industrial location of Pyeongyang, Nampo, Gaeseong and Haeju on the west coast and Cheongjin and Hamheung on the east coast are relatively nice at the beginning stage. Pyeongyang and Nampo are advantageous for labor-intensive industry and some heavy industries. Gaeseong has some comparative advantages over other cities in labor-intensive light industry. Haeju and Hamheung have some comparative advantages in petrochemistry and primary metal industry.

At the expansion stage, the results are similar with the beginning stage. At the deepening stage, Cheongjin, Rajin-Seonbong, and Gaeseong have the second best condition of location following Pyeongyang and Nampo. Pyeongyang has the best condition of all industries at each stage. Wonsan should foster the light industry considering Guemgang Mt. tour. Shinuiju has the comparative advantage on the light industry. Gaeseong is advantageous in the light industry and tourist industry, but it needs to be developed as a cultural-historic city with its abundant historical remains.

Chapter 5 suggests some directions of industrial development for 9 major cities. Conclusively speaking, the upbringing of export-oriented light industry and selective partial normalization of existing heavy industry are important and needed. And a road system to link peripheral areas, consolidation of a network of railroads and harbor facilities are needed as well. Especially Gaeseong, Shinuiju, Rajin-Seonbong and Wonsan which are built up as a special economic zone are pointed to consolidate to physical and institutional infrastructure urgently.
Some policy issues to the two Koreas for developing industries of the North Korean cities are suggested in Chapter 6. Industrial development in the North Korean cities should be implemented according to the changing demands of inter-Korean economic cooperation. Industrial development of North Korea cities is needed to be implemented step by step. At the beginning stage, the infrastructure corporation of governmental levels is very important. It is necessary for the industrial development in the North Korean cities to drive international cooperation especially with the Northeast Asian countries. Japan and China could be important cooperation partners to two Koreas.

To alleviate the tensions from nuclear-weapon developing programme is the first task for developing international cooperation with the Northeast Asian countries. Unless North Korea address the willingness of abolition of nuclear-weapon developing programme to the world, it could be impossible to drive industrial infrastructure corporations with other countries. Also, the openness of information about North Korea's infrastructure is needed because the international society including South Korea, which will invest in North Korea enormously, needs to know about the actual conditions of infrastructure.

Chapter 1. Introduction

Over the last decades, water quality management in Korea has been driven by the
control of point sources of pollution and use of effluent-based water quality standards. Under this regulation, the quality of the nation's rivers, reservoirs has been generally improved as wastewater treatment plants and industrial dischargers have to comply with effluent-based standards. But still many parts of water body are impaired by point and non-point pollution.

The primary objective of this research is to study the impacts of regional economy and land use by implementing Total Pollution Load Management System (TPLMS) in Korea. To attain the primary objective, this study considers following methodologies: Two methods are employed to analyze the impact of regional economy by implementing the TPLMS. One is a micro-model using production function and pollution reduction function, the other is a macro-regional economy model.

The sensitivity analysis is employed for the impacts of the TPLMS on land use change. When the amounts of pollutant elimination are assigned at each city under the TPLMS, then each city (county) has to make a plan to attain the target of water quality standard. We assume that each city treat point source pollutants at first with available methods such as sewage treatment and industrial effluent treatment plants. What is left from point source pollution treatment is burdens of non-point source pollution treatment. At this stage, we consider land use change for the control of non-point source pollution.

Chapter 2. Current Situations and Issues

The TPLMS, initiated in the 'Act for water management and upstream region's resident support in the Nakdong River, Geum River, Yeongsan Sumjin River', recently emerged as a foundation for nation's efforts to meet water quality standards. This act specifies the amount of a particular pollutant (BOD) that may be present in a water body, allocates allowable pollutant loads and provides the basis for attaining and maintaining water quality standards. The act requires that each metropolitan city and province establish a comprehensive plan of total pollution management system. If waters fail to meet nation's standards, each city should establish an implementing plan to comply with water quality standards.
The major issues and problems related to the introduction of TPLMS are as follows: First, there are some insufficient informations such as water flow data, water quality data, unidentified delivery path. Second, the ratio of point source pollution is 62.6% ~ 78.3% in Korea, so this indicates that a counter plan to reduce point source pollution is essential prerequisite. A similar system in the U.S.A., Total Maximum Daily Loads(TMDL) focuses on the non-point source pollution control compared to our approach. Third, side effects on regional economy are not sufficiently considered before the TPLMS is introduced. Forth, there are insufficient experts to implement the TPLMS in local government.

Chapter 3. Relevant Literature Review

There are a few reports related to TPLMS in Korea. These reports demand alleviation of 'natural reservation area' regulations at upstream regions when the water quality meets the nation's water quality standards. Within 10 years of the Clean Water Act's passage, significant improvements in water quality were being reported by EPA but 30% to 40% of waters still fail to meet state standards in U.S.A. Recognition is now widespread that non-point sources are of principal concern. Municipal and industrial sources clearly do not predominate. Instead, a host of non-point sources, in particular from urban and agricultural runoff, loom large. Pesticide, fertilizer, and animal waste runoff from agricultural sector is the single largest contributor to the impairment of rivers and lakes. If more tight standards to point sources are applied, then more burden to industrial activities will be carried. That is why the U.S.A. introduce TMDL programs to control non-point sources pollution.

In Japan, Total Maximum Pollution Loads System(similar to TMDL) is applied to severely impaired waters such as Tokyo Estuary, Ise Estuary, etc. TMDL system is not applied in EU. EU still focuses on point source pollution to improve water quality.

The impacts of environmental regulation on economy are categorized into productivity, employment, economic growth, firm location, foreign direct investment, industrial structure, etc. Researches show various results and suggest some implications. Overall, the
results of studies which examine the impact of environmental regulation on economy are contrary to each other. Although social costs of environmental regulation may be significant, including adverse effects on productivity, studies attempting to measure plant location decisions and net growth effects are either small, statistically insignificant, or not robust to the test of model specification.

Grossman and Krueger (1995) show that economic growth brings an initial phase of deterioration followed by a subsequent phase of improvement. Jorgenson & Wilcoxen (1990) quantify the cost of pollution controls by reporting the results of simulations of the growth of the U.S.A. economy with and without regulation. The results show that pollution abatement has emerged as a major barrier on the economy. Unfortunately, they have not attempted to assess the benefits resulting from a more clean environment. Porter and Linde (1995) assert that the relationship between environmental regulation and industrial competitiveness is not trade-off, but well-designed environmental regulations might lead to improved competitiveness. The researches which handle the relationship between land use and water pollution are very few. Land use is of concern for water quality conditions and aquatic health. Walls and McConnell (2004) have reviewed market-based policies, TDRs, PDRs, and development impact fees, to reduce pollutant levels to the Chesapeake Bay in the future. They found that a combination of TDRs, PDRs, and development impact fees may offer the best options for achieving desirable water quality. Ligtenberg et al. (2004) use multi-agent system to include multi-actor decision making into models of land use change. Bacon et. al. (2002) use Belief Network Model to make a decision for land use change. Belief Network Model is used to estimate what kind of land use is the best option with comparing anticipated benefits of each alternative land use. The approach is illustrated with a case study of the factors that might influence changes from farm land to forestry in marginal upland areas of the UK.

Chapter 4. TPLMS and Regional Economy

Two methods are considered to analyze the impact of environmental regulation on
economy. One is micro-approach using production function and pollution abatement technology function of firm. The responses of firms are different according to the characteristics of firm's production and pollution abatement technology functions when the regulation of water quality is more tightened. If the parameters of production and pollution abatement technology functions are all diminishing returns to scale \((0<\alpha<1, 0<\delta<1)\), then the best response of firm is to reduce products. If the parameter of production function is diminishing returns \((0<\alpha<1)\) and the parameter of pollution abatement technology function is constant returns \(\delta=1\), then the best response of firm is to increase products. If the parameters of firm's production and pollution abatement technology functions are \(0<\alpha<1, \delta=1\) or \(\alpha>1, \delta=1\), then the best response of firm is to produce goods without considering pollution regulation level.

A macro-economic model is considered to capture the impact of environmental regulation on gross regional domestic products. A macro model consists of three part, production, employment, environment. Each part also consists of several equations and total 14 equations are used for the estimation. The case study area is Daegu metropolitan city and we focus on the impact of manufacturing industry of the enforcing water quality standard. The result of analysis shows that gross regional domestic product is reduced by \(0.16 \sim 0.18\%\) point if the amount of pollution treatment is increased by 1% point owing to the TPLMS.

**Chapter 5. TPLMS and Land Use**

The impacts of TPLMS on the land use change are analyzed in this section. First, we have to reduce the difference between the amount of pollution loads and the amount of pollution discharge allowance. Second, we calculate the maximum amount of reduction of non-point pollution in land use using a non-point pollution loads per acre. We simulate the land use change to meet the water quality standards in assuming that the amount of pollution elimination in land use(non-point source pollution) is given by various scenarios. Cheongju city is selected for the case study because this city has well defined GIS data for the analysis.
The results of research show that Cheongju city will confront the shortage of land for urban usage if more than 20% of total pollution reduction are assigned to non-point pollution through land use change. This suggests that sustainable development of city can be achieved by considering the impact of land use change when we assign the amount of reduction of non-point pollution by TPLMS.

Chapter 6. Conclusion

The results of this study give us some policy implications from point of views such as water quality monitoring and data collection, impact on land use and regional economy etc. Related to TPLMS's successful implementation, policy suggestions and recommendations are categorized in three parts as follows:

The first part is related to TPLMS itself for the more efficient performance. Government needs to develop a uniform and consistent approach to ambient monitoring and data collection across water basins. Limited budgets make it difficult to monitor all of waters. So, government should endorse statistical approaches to defining all waters, proper monitoring design, data analysis, and impairment assessment. Monitoring and data collection programs need to be coordinated with anticipated water quality and TPLMS modeling requirement. We need to foster experts related to TPLMS at the level of central and local government.

The second part of policy suggestions is based on the results of chapter 4 which deal with economic impacts of TPLMS. The differentiation of standards of regulation based on industrial classification and scale of firms should be achieved avoiding evenly environmental regulation. If there are lots of administrative burden in carry out differentiated regulation, we need to promote to introduce pollution trading system. We need to have more flexible system or adjust the time schedule of TPLMS implementation through the more comprehensive and quantified analysis of regional economic impact of TPLMS.

The third part of policy suggestions is related to land use change. While we establish a comprehensive TPLMS plan and implementing TPLMS plan, the burden of local
government's budget, impact of industry, urban land use pattern etc. should be reviewed in advance.

None of the preceding studies has estimated the impact of regional economy and land use of TPLMS from regional macro economic models and land use simulation. Therefore, the approaches taken in this study will contribute to the development of impact analysis of TPLMS on regional economy and land use change. The limit of this study is insufficient data owing to the lacks of statistic data related pollution investment. So, the results of this study may not be robust in the interpretation of econometric analysis. For more concrete analysis, we need to accumulate environmental related investment data such as stock and flow investment. With the limit of data related land use and regulation policy, we do not suggest the most reasonable alternative, instead we suggest the various alternatives, which enable decision makers to choose the rational selection for sustainable development and environmental protection.

I - 4

International Cooperation for Industrial Development in North Korea: Based on the Experience of the Former GDR and Poland

북한의 공업지역개발을 위한 국제협력 방향 연구: 구 동독과 폴란드의 사례를 토대로

Sang-Jun Lee, Won-Bae Kim, Moon-Woun Lee, Wendelin Strubelt, Karl-Peter Schoen

RR 2004-1 · March 2004 · 168 pages · Korean

This collaborative study aims at searching effective methods of international cooperation to develop North Korea's industrial regions based on the lessons from the experience in the development of industrial regions in former East Germany and Poland. The BBR in Germany as a partner institution rendered a great help in this study. In particular, the BBR carried out case studies on Germany and Poland. Professor Gorzelak
at the University of Warsaw and Professor Szczpanski at the Tychy Business School provided valuable materials for the case studies on Poland.

The study consists of seven chapters. The first chapter discussed the need of the study with research objectives. The reasons for selecting the former GDR and Poland are twofold. One is the similarity in industrial structure between them and North Korea. The other is that both the former GDR and Poland utilized international cooperation effectively for the development of their industrial regions.

Chapter 2 shows some issues on the industrial development in North Korea. The development of industrial regions usually includes two major components: industrial infrastructure and production facilities. And these components can be discussed by region and by stage. In terms of industrial infrastructure, North Korea's industrial regions are known to suffer greatly from the shortage of electricity and transportation. The expansion of these infrastructure facilities is critical for the recovery and development of industrial regions. Investment in new production plants and equipments is also very much wanted, since most production facilities in the North are dilapidated. In particular, Suncheon and Dukeheon in Pyongan-do and Cheongjin and Kimchaek in Hamgyeong-do are known to suffer severely from the dilapidated production facilities and the shortage of infrastructure.

In the short to med-term, transportation infrastructure in and around a few major industrial areas is the most urgent item to focus on since the delivery of raw materials and inputs is critical to the normalization of the existing production facilities. In the long term, the infrastructure foundation of the existing industrial regions should be completely overhauled in addition to investment in new production facilities. Region-wide infrastructure networks such as railway, road, and energy distribution should be built when localized infrastructure demands are met.

The renovation of production facilities in the North requires an enormous sum of investment. Given the absolute shortage of investment resources in the North, the participation and assistance of the international community is essential. Such international assistance will not only help financing of infrastructure building but also contribute to the transfer of technologies, management know-how, and professional manpower.
As expected in the closed economy, international cooperation in the industrial development of North Korea has been negligible except for the former Soviet assistance in the early years of industrialization in North Korea. Recently, the North Korean government attempted to host foreign investment in the Rajin-Sonbong economic and trade zone but the result was disappointing. Needless to say, international cooperation is highly unlikely unless North Korea's nuke problem is resolved. Even if we assume a peaceful solution of the nuke problem, there remains an issue of how to (re)develop the industrial regions of North Korea.

In Chapter 3 and 4, the experience of international cooperation in the former GDR and Poland are reviewed. In the renewal of the old industrial regions in the former GDR, the EU programs played a significant role. In particular, the project called, FOCUS(The Future of Industrialized Cities and Regions undergoing Structural Changes) was carried out to help formulate the redevelopment strategies for the mid-east industrial regions. The project recommended a need to cooperate among the old industrial cities and regions to solve their structural problems through the exchanges of their experiences.

A successful example of renewing an industrial region can be found in Riesa, which was an old steel city in Sachsen. At the time of German unification, Riesa had a steel mill, which employed 12,000 workers. The number of workers was reduced to 4,000 after restructuring over four years. The key factor for the success of Riesa lies in the close cooperation among the local, regional, federal actors such as the Riesa Company, the city of Riesa, the county of Riesa, the Lander of Sachsen, and the Labor Ministry of the federal government for the restructuring of the steel mill and their concerted efforts in hosting foreign investment. The financial support from the federal government, the European Union, and the Treuhand for the infrastructure building and employment stabilization was another critical factor for the success of Riesa.

In the case of Poland, the role of the European Union was perhaps greater than that of the former GDR. Two EU programs of STRUDER and PHARE were particularly influential in rebuilding the industrial regions of Poland. These two programs rendered assistance in the areas of training, infrastructure development, environmental preservation,
and the development of administrative infrastructure. In addition, Poland received a great help from international financial agencies such as World Bank. Among the energy and transportation projects, the Katowice Heat Supply and Conservation Project supported by IBRD (The International Bank for Reconstruction and Development) helped increase the energy efficiency as well as reduce environmental pollution in the Katowice region. Another example supported by IBRD is the refurbishment of railways in Poland. The purpose of the project was to reduce surplus labor in the railway operation system and thereby to increase the operational efficiency. Within two years between 2000 and 2002, the number of workers was reduced from 182,000 to 145,000 persons.

Poland also provides a successful example of special economic zone, which has important implications for North Korea. The special economic zones in Poland were implemented as a policy tool to achieve the goals of attracting foreign investment and balanced regional development. As of September 2003, there are 15 special economic zones in Poland and they are given special privileges of tax exemption. The Katowice special economic zone was designated in June 1996 and it has 4 sub-zones consisted of Gliwice, Tychy, Sosonowiec and Dabrowa, Jastrzebie and Zory. The Katowice special economic zone as the largest one in Poland has thus far hosted 110 enterprises employing 12,500 workers.

In Chapter 5, some lessons from the experience of the former GDR and Poland are defined. North Korea shares similarities with Poland and the former GDR at the initial stage of the latter's reform and opening. For example, all of them share the characteristics of an industrialized socialist economy. North Korea is, however, far behind Poland and the former GDR in terms of reform and opening. Poland and the former GDR had already high levels of reform and opening even before they began a transition to market economies. We can also point out an additional contextual difference: Poland and the former GDR had a more favorable environment than does North Korea right now to seek international assistance. The role of the EU and international financial agencies was significant for Poland and the former GDR, whereas North Korea has not many countries to depend on for its economic survival except for China and partly South Korea.
Therefore, North Korea's economic position will not get better unless the security issue surrounding its nuclear development is resolved.

The major lessons from the experiences of Poland and the former GDR with respect to infrastructure development can be summarized as follows. First, the role of government is essential in infrastructure development. For example, the federal government of Germany rendered a large financial assistance for the expansion of transport, energy and communication facilities in the old industrial regions of the east. Investment in infrastructure building by regional governments was an important factor for the success of the Katowice special economic zone. Therefore, it is a must for North Korea to make an exemplary investment in infrastructure in limited areas to obtain international assistance as well as to attract foreign investment.

Second, North Korea should learn how to utilize international cooperation for its infrastructure development. As indicated in the experiences of Poland and the former GDR, the EU provided an umbrella under which many infrastructure development projects were carried out. The role of the World Bank was substantial for Poland. As shown in the example of FOCUS, North Korea can learn a great deal about industrial restructuring and infrastructure development from China, in particular, the northeastern provinces and the Russian Far East. Setting up a network with these provinces and sharing information and experiences will help North Korea in developing the strategies to redevelop their old industrial regions.

The third lesson is concerned with the importance of environment. The example of Riesa, where the soil contamination issue in the old industrial sites was thoroughly addressed before the conversion of the sites for new uses, is a reminder for North Korea. Fourth, North Korean policy makers can learn the importance of social stabilization measures in any restructuring efforts. For both cases of steel mill restructuring in Riesa and railway restructuring in Poland, retraining and reemployment programs helped stabilize unemployment problems arising from restructuring. Fifth, it is more advantageous to utilize the existing industrial areas rather than to build new industrial areas in terms of costs and environmental damages.
A few lessons can also be learned from the experiences of Poland and the former GDR with respect to hosting foreign direct investment. As shown in the examples of Riesa and Katowice, the concerted efforts of central and local governments are essential to attract foreign direct investment. North Korea has to be much more active in marketing their special economic zones in addition to building up physical and institutional infrastructure. As indicated in the example of Katowice, North Korea's policy makers should develop strategies differentiated by zone, e.g., each zone's location, industrial characteristics, etc., in order to host foreign direct investment.

Chapter 6 suggests some policy directions for international cooperation for industrial development in North Korea. Given the dire economic situation of North Korea, North Korea should first seek international cooperation in the redevelopment of its industrial areas. East European experiences suggest, however, that such efforts should be directed to secure an institutional base for international cooperation. In this regard, the INTERREG-CADES of EU could be a good example to emulate. Setting up a program for “Infrastructure Development of Industrial Areas in Northeast Asia” would be useful. Through this program, North Korea can share experiences of similar industrial areas in China and Russian Far East. Also, it is easier to secure funds through this program from neighboring countries and international agencies than to secure by North Korea alone. Bilateral cooperation with China, Russia and South Korea rather than multilateral cooperation would be easier in the border areas, where adjoining countries can promote mutual interests with North Korea.

In order to attract foreign direct investment, it would be better to develop small and medium sized industrial parks in the areas, where infrastructure is relatively well endowed, rather than large-scale special economic zones. This will not only make North Korea able to concentrate its scarce investment resources in a few parks but also raise the likelihood of success in attracting foreign direct investment. Finally, to effectively develop the industrial areas in North Korea, it is necessary to devise a strategy of staged international cooperation by the three parties--North Korean government, foreign enterprises and international agencies. In the early stage, it is desired to pursue
infrastructure development by international assistance. At this stage, North Korea can set up a few industrial parks with favorable policy privileges for foreign direct investment. In the later stages, North Korean government can consider the nation-wide infrastructure development program in consultation with international financial agencies.

With sustainable development establishing itself as a global trend, sustainable tourism has also been gaining attention these days. In Korea, ecotourism and green tourism have recently attracted significant attention as two of the main kinds of sustainable tourism. These two sectors continue to see market expansion despite the fact that they are still in their initial stages. Moreover, the Ministry of Environment, Ministry of Agriculture and Forestry, and the Ministry of Government Administration and Home Affairs have been actively pursuing related policies for their development.

Despite growing interests, however, there are too few cases of sustainable tourism in Korea that can be differentiated from existing tourism developments. There are even criticisms that sustainable tourism is actually damaging the environment, and not effectively linked to the growth of regional economies.

Chapter 1. Introduction
Korea's central and local governments have been promoting the sustainable development of Korea's tourism industry, yet it has been found that their policies are
similar to already-existing strategies or processes for tourism development. This hinders the government's target to achieve sustainable development of Korea's tourism industry, not to say successful cases.

This research aims to explore ways to vitalize sustainable development of Korea's tourism industry, focusing on ecotourism and green tourism. It analyzes current systems and policies of the nation's sustainable tourism industry, related issues, and developmental cases that have been achieved so far. Suggestions of various government tasks for a successful development of sustainable tourism will also be posed. The method of research covers use of literature, empirical data, and interviews.

Chapter 2. Concept of Sustainable Tourism

The importance of protecting or preserving the environment has been consistently raised in the global tourism industry since the beginning of 1960. Yet, efforts for environmentally sustainable tourism did not actually start until the WTO and WYYC adopted Agenda 21 for the Travel & Tourism Industry in 1996.

Sustainable tourism refers to a “development that meets the needs of the present without compromising the ability of future generations to meet their own needs including tourism.” Sustainable tourism brings social equity, economic efficiency and environmental conservation into harmony. This research sets these three factors as preconditions for successful development of sustainable tourism. Sustainable tourism includes various types of tourism, with ecotourism and green tourism being the two representative types. The purpose of ecotourism is to understand environment and culture; therefore, development focuses on conserving the environment and benefiting local areas and their inhabitants. The development of green tourism, on the other hand, focuses on attracting people living in the cities to rural areas, forests and seaside villages where they enjoy their leisure time and various unique experiences that these places provide.

Chapter 3. Current State of Sustainable Tourism and Problems

This research analyzes laws and systems related to ecotourism and green tourism, as
well as the current state of these businesses. It attempts to deduce possible problems. Currently, the Ministry of Culture and Tourism, Ministry of Environment, Ministry of Maritime Affairs and Fisheries, Korea Forest Service, and Rural Development Administration promote various related policies for sustainable tourism. But these governmental policies lack concrete initiatives in terms of a detailed business road map or well-organized system.

Chapter 4. Cases of Sustainable Tourism Developments

This chapter analyzes several cases of sustainable tourism found in Korea and draws out some problems facing the current state of sustainable development. Togomi Village of Hwacheon (located in Gangwon Province) was selected as an area for green tourism analysis, and the Migratory Birds Ecotourist Area in Cheorwon Plain was chosen for ecotourism.

The Migratory Birds Ecotourist Area was developed for the purpose of creating a bird watching tour. The Cheorwon area was selected as an ecotourist area where cranes including white-naped cranes inhabit. Meanwhile, Togomi Village in Hwacheon is a representative case of green tourism; it was a typical agricultural village seen in Korea as a place without any special scenery, or resources. But now, more than a million people visit the site every year for the agricultural experience and products.

Yet it has been found that the current sustainable tourism development lacks sufficient contents for planning, management, profit creation and distribution, environmental explanation and educational programs. Other problem included low participation of inhabitants, issues surrounding the use of regional resources and their conservation, low cooperation between all interested parties, and poor linkage to regional societies.

Chapter 5. Preconditions for a Successful Sustainable Tourism

This chapter analyzes current laws, systems, policies and development cases of sustainable tourism, based on the three principles of sustainable tourism development, which are economical continuity, environmental continuity, and socio-cultural continuity.
We were able to draw out several preconditions for a successful sustainable tourism based on this analysis.

According to the analysis, government tasks for a successful promotion of sustainable tourism can be summarized as following. First, development methods should be changed to take local society and software-oriented developments into greater consideration. Second, it needs to ensure that there are continuous demands for sustainable tourism, and a reasonable profit model needs to be created. Third, financial resources should be obtained and efficiently executed. Fourth, parties promoting the development should be more systematically organized, leader cultivation should be promoted, and a stronger participation of inhabitants and cooperation among parties needs to be realized. Finally, the use and management of environmentally friendly resources are also necessary.

More detailed and necessary changes to development methods include the need to direct greater development needs towards regional communities, greater participation from the regional population, and software-oriented updates. As for detailed plans to create a reasonable profit model, a continuous demand for ecotourism and green tourism needs to be ensured, new sources for profit should be sought out, and profit models should be developed.

In order to secure resources and build an efficient system for their execution, diversification of resources and improvement of business operation system need to be promoted. To form a systemized organization and induce cooperation, a system linking inhabitants should be made, leaders should be cultivated, participation of inhabitants and expansion of their role should be strengthened, and cooperation among those interested parties should also be promoted. To use environmentally friendly resources, sustainable development and management systems should be created, and areas for ecotourism and green tourism need to be searched.

**Conclusion**

Although the government has been promoting regional growth through tourism development, simply focusing on existing tourist areas is a limited strategy at best. Thus,
it is introducing sustainable tourism as an alternative. Nevertheless, it is difficult for the government to achieve a target of sustainable tourism only referring to the existing laws, systems, policies, and development methods in place.

For a successful development of sustainable tourism, efforts are needed to nurture development methods, promotion systems, and the skills of those executing such programs. The use of resources should also be kept within a sustainable level allowed by the environment. This means that a development strategy, centering on regional inhabitants, industries, and resources needs to be sought. Such promotion will depend on successfully researching and creating a new development model, and studying ways to induce the participation of regional residents.

This study was planned to answer two fundamental questions. Why development and environmental conservation tend to conflict with each other? How can we reconcile both sides of the conflict? We believe that an acute conflict surrounding a national land development project or policy, in particular, would be resolved considerably if the true value of the environment could be quantified. In order to help resolve or avoid such a conflict, this study makes some practical suggestions as to how and under which conditions to value the negative and positive impacts of a national land development
project on the environment. This study has seven chapters, as follows.

Chapter 1. Introduction

This chapter introduced the background, rationale, purpose, study area, and the framework of the study, focusing on the case of land development, especially road and dam constructions. This chapter reviewed the main contents of the study: the selection of cost and benefit items to be used for environmental valuation; the application of these items to the assessment of individual projects; the trends and cases of environmental valuation applied to policy making, domestic and abroad; and how to incorporate environmental valuation into the Korean institutional system of assessment.

Chapter 2. Public Projects and Theories of Environmental Valuation

Decision making about whether to conduct a public project(or policy) in question or which one to choose from the alternative projects requires judgement about the rationale for the decision. One of the most frequently visited criteria for the rationale is whether the associated benefits outperform the costs, which means the cost benefit analysis(CBA). This chapter briefed the role and trend of CBA, and summarized the theories of environmental valuation that is used to quantify environmental costs and benefits.

Defining ‘environmental value’ as an ‘umbrella’ concept, i.e. where it encompasses both ‘environmental benefit’ and ‘environmental cost’, as well as both ‘use value’ and ‘non-use value’, the environmental valuation methods were classed into two broad categories: revealed preference method and stated preference method. We introduced the main features of replacement cost method(RCM), travel cost method(TCM), hedonic price method(HPM), contingent valuation method(CVM), and choice experiments(CE).

Chapter 3. Environmental Valuation of National Land Development Projects: Experiences and Problems

In this chapter, we learned about the problems of environmental valuation from the experiences of major large-scale development projects of this country that were reassessed
as a result of acute conflicts between the developers and the environmental conservationists: namely, projects associated with Saemankeum Tideland, Kyungin Canal, Seoul Outskirts Circulation Highway, and Kyungboo Express Railroad.

We found that the current FS(Feasibility Study) and PFS(Preliminary Feasibility Study) regulate to incorporate environmental valuation into the CBA, and that a guideline from the Ministry of Construction and Transportation regulates to monetize the benefits of reduced levels of noise and emission from roads and railroads. Both of them further request to use valuation techniques wherever developed. However, there seemed to exist no apparent regulation by which the costs incurred due to increased levels of airborne particles and noise, ecosystem destruction, etc. have to be monetized.

We checked the results of reassessments made recently of the economic feasibilities of the four large-scale projects mentioned above. We confirmed, from the comparison of the CBA results with and without consideration of the environment, that some of the projects whose economic feasibilities were validated without reflection of monetized environmental costs may not necessarily turn out to be feasible when such costs are included. Moreover, the reassessment process per did not appear to follow a rigorous and objective environmental valuation.

The following implications were drawn. First, environmental values, both use and non-use values wherever possible, should be incorporated into the assessment of economic feasibility of a large-scale land development project that has environmental and/or biological impacts. Second, the cost and benefit items and the techniques of environmental valuation should be standardized to ensure a correct environmental valuation, and thereby to reach a mutual agreement between the developers and the conservationists. Lastly, study results derived based on the stated preference method should always be validated with respect to potential biases and methodological limitations germane to the method.

Chapter 4. Environmental Valuation and Policy Making in Major Countries

In this chapter, environmental valuations used for policy purposes in the following countries were reviewed: the USA, the UK, Japan and Korea. As for the USA, the
demand for environmental valuation has increased for policy making and compensation liability purposes. We reviewed the guidelines provided by Environmental Protection Agency, the Department of Interior, the US Army of Corps of Engineers, etc., and studied the trends in the guidelines on the environmental valuation techniques including the CVM developed since the Exxon Valdez accident.

Environmental valuation does not have any legal recognition in the UK. However, the Government has long been supporting private sector studies on environmental valuation, especially since 1998 when the Prime Minister emphasized to assess the economic feasibility of public expenditure using CBA. We reviewed the cases in which environmental valuation is emphasized or applied by the HM Treasury, Department for Environment, Food and Rural Affairs, Forestry Commission, Department for Transport, etc., before listing major UK studies.

Individual Departments of the Japanese Government developed separate guidelines on CBA in 1996 when the new Cabinet announced a new scheme to improve the efficiency of public investments. Since around this time, environmental valuation techniques have been developed considerably mainly in the fields of environmental economics and civil engineering, leading to the accumulation of empirical studies and an increased interest in the environmental valuation for CBA purposes. The former Ministry of Construction provided an integrated guidance on the CBA, and suggested for a guidance on the ‘extended’ CBA that measures environmental costs and benefits of a project. Various kinds of manuals for the ‘extended’ CBA are available, specific to individual projects. However, they do not involve environmental costs - they only concern environmental benefits.

From the early 1990's, efforts have been made in Korea to estimate various kinds of environmental values. The demand for the standardization of environmental valuation and the selection of its items have continued to increase, especially being influenced by the ‘extended’ CBA used to reassess the Saemankeum Tideland project. The Government is trying to find ways of incorporating environmental feasibility and environmental valuation into policy making or institution to avoid a national project meandering due to an acute
conflict surrounding environmental protection. Several Departments of the Government are supporting some base studies on environmental valuation and its applicability and are planning to utilize the study results for FS, PFS and EIA (Environmental Impact Assessment).

Chapter 5. Criteria for Environmental Valuation of Major National Land Development Projects and Their Application Schemes

The reliability of the cost and benefit items of environmental valuation is crucial for CBA incorporating environmental impacts. This chapter showed a six-step procedure under which reliable items are selected, and provided the criteria for environmental valuation and their application, focusing on the cases of road and dam construction projects.

In the case of dam construction, the recreation values of dam reservoir and waterfront and the improved water quality of the downstream were selected as the items of environmental benefit. The environmental cost items selected were loss of amenity value, habitats and species, and destruction of cultural heritages and historical sites. We chose environmental valuation techniques including the TCM, HPM and CVM, item by item, suggesting two types of manuals that can practically be used for these techniques.

The environmental benefit items selected for road projects were the effects of improved driving conditions on reducing air and noise pollutions, whereas the cost items selected were the effects of car driving on alleviated air and noise pollutions and loss of habitats and species. We chose the TCM, HPM, CVM, etc. and three possible types of manuals.

Chapter 6. Enhancing Policy and Institutional System

In this chapter, we discussed how to improve the functioning of the CBA of national land development projects affecting the environment and at which stage to apply environmental valuation. We suggested to standardize the criteria and procedure for valuing the environmental impacts, as follows. First, both positive and negative impacts
should be considered. Second, the procedure of environmental valuation should be generally accepted by the public. Third, the economic efficiency of a project should be assessed. Lastly, such a procedure should not be too difficult to follow.

We emphasized that, apart from the EIA that requires a scientific assessment of environmental impacts, the economic and technical feasibility of a project should be assessed based on a CBA that uses quantified environmental values. We suggested to proliferate the use of the ‘extended’ CBA, which considers the environment, by preferentially applying it to all projects that are large in scale, likely to have serious environmental impacts, or under dispute; by expanding environmental cost and benefit items, by ensuring an objective EIA; by accumulating reliable data; and by amending relevant laws and guidelines. The chapter also looked at the possibility of incorporating environmental valuation into the EIA, given that the EIA system allows the public to present their opinion on a public project.

**Chapter 7. Conclusion and Future Study Arenas**

The ultimate goal of developing the criteria for and the methods of environmental valuation is to provide a preparatory and constructive solution to the conflict between development and conservation surrounding the implementation of a national land development project. The mere dichotomy between development and conservation can not reconcile both sides of the conflict. The developers or the conservationists getting a fixed idea and sticking to it will make the conflict and distrust to reach at their height. Both sides need to make, therefore, a constructive discussion, believing in a third choice somewhere between the two extremes. This study intended to stimulate such a discussion by emphasizing the reconciling role of environmental valuation.

Despite the fact that environmental values should be reflected in a national land development project, it may not be easy to monetize environmental costs and benefits. This study attempted to illustrate mainly with road and dam construction projects how to select and apply the items of environmental costs or benefits. Unfortunately, we realized a number of obstacles should be raised in order for these items to be incorporated.
into the Korean institutional system. In order to derive reliable environmental values for a national land development project, the criteria for and principles of environmental valuation should be established and consensus in policy making process needs to be built, as follows.

First, the use and non-use values of the environment should be identified clearly and objectively. The environmental costs and benefits of a project should be reflected in the policy making process. All the relevant information about the externality of the project should be completely open to everybody and all the interested parties should be allowed to take part in the policy making process if they want to.

Second, the objectiveness and reliability of the results of EIA should be secured in order to make the associated environmental valuation to be reliable, enough to result in a mutual agreement between the developers and the conservationists readily.

Third, environmental valuation techniques need to be refined continually, paving the way for a better environmental valuation in the future. In particular, techniques suitable for Korean situation should be developed with respect to their applicability, reliability, data availability and cost-effectiveness when applied to Korea.

Lastly, and as future study arenas, we suggested that the limitations and obstacles raised so far need to be overcome through the practical application of any constructive suggestions, and that governmental support for the proliferation of environmental valuation study should be expanded.
The Presidential Committee on Balanced National Development (PCBND) report the New Vision of the National Territory to the president on January 29th, 2004, the day when the Era of Localization and Balanced Development was announced by the president of Korea. This report synthesizes papers prepared by authors from fifteen research institutions who participated in the writing of the strategic report on the new vision of the national territory. This report supplements the contents of original manuscripts and coordinates differences arising from authors with different research background. The overall objective of this report is to enhance the quality of original report to a higher level. Consultation as well as supplement of manuscripts by experts were employed to provide the theoretical and philosophical background of the long-term territorial vision and specific implementation strategies.

The strategic report on the new vision of the National Territory is consisted of the following sections: background and role of the New Vision; diagnosis of current situation; trends and prospects of internal and external conditions; vision and paradigm of the new territory; five strategies; regional development based on interregional linkages; new partnership through localization; future image of the new territory; implementation agenda of the new territory; and road-map of agenda.

The chapter on the background and role of the new territorial vision presents the concept of the new territorial vision, the background of the new vision and the relationship to the fourth comprehensive national territorial plan. The next chapter presents a comprehensive diagnosis on the current economic structure of industries,
finances and science and technology, entrapment of per capita income of the nation into
ten thousand dollars, and problems of land use and management.

The chapter on the trends and prospects presents analysis on various topics including
changes in internal as well as external circumstances in East Asia and Korean peninsula,
prospects of changes in the structure of national territory, and factors of threats and
opportunities regarding territorial development.

New territorial development demands a significant paradigm shifts: from quantitative
growth led by the central government to qualitative growth led by local governments;
from uni-polar territorial structure to multi-polar territorial structure; from isolated
regional development to inter-connected regional development; from development oriented
growth to environment friendly development; and from domestic orientated territorial
development to international orientated territorial development. The vision of the new
territory is to build the Dynamic Korea through the innovation led strategy, contrasting
to the input driven strategy of the past.

Five strategies are proposed to achieve the vision of the new territory: an innovative
territory, a multi- nucleus territory, a networked territory, a sustainable territory, and a
globalized territory. In addition, special emphasis is placed on the concept of
inter-connected development among regions with specialized characteristics. Examples of
areas of inter-linked development of regions include manufacturing industries, education
and cultural industries.

The chapter on the formation of new partnership based on the decentralization of
administrative functions emphasizes cooperation and mutual learning among industries,
academics, researchers and public institutions that including the governments for the
innovative and endogenous development of region. For smooth functioning of the
partnership, specific roles of the central government, local governments and private sector
are presented. The central role is expected from the Regional Committee on Innovation
that represents various sectors participated in regional development and is formed at
regional and local level.

The last chapter is the future image of the new territorial development. Selective
socio-economic indicators and the configuration of comprehensive territorial structure called the Dynamic Korea in the 21st Century are presented. Territorial structure of the nation is consisted of three coastal axes and six regions, which is called phi plus hexagonal structure. The new territorial structure is expected to promote the balanced regional development within the country and accommodate launching posts to the outside world, enabling national cohesion and improved national competitiveness.

The new territorial vision is expected to serve as the basic guideline for the future national territorial development. Physical infrastructure, specialization of industries and institutional foundation should be integrated to perform the key role for the innovation driven balanced territorial development. The future image of the country is the one with high incomes and high quality of life comparable to leading advanced nations. The formation of balanced and innovative territory is the key for that goal.

This research aims to come up with environmental management measures to support the sustainable use and development of river-mouth areas with conserving their environmental values and functions. The project is carried out for three years and this report is the result of the first year's research that focuses on setting river-mouth boundaries and classifying river-mouth areas and developing managerial strategies. It was conducted by four think tanks affiliated with the Korea Council of Economic & Social
Research Institutes (KCESRI)

We set the boundaries of river-mouth areas for 14 representative rivers in South Korea, considering their features in terms of physical status, terrain, geology and land use. The land area reaches the upper limit influenced by tidal movements. The maritime border is set on the basis of river-mouth's terrain, geography and usage. And the width of the area is set to include all the basin of branches that flow into the river.

We analyzed the present status, environmental pressure, and responsive management for the river-mouth areas based on basic materials. The results show that most river-mouths in Korea have been intensely damaged from excessive use and development and this trend will be lasting for a long time.

Those areas have 77 industrial parks including more than 300,000 factories, and big ports that can accommodate 45.6 per cent of Korea's total ship freight. 45.5 per cent of Korea's overall reclamation area, i.e. 328.9km² is concentrated in those areas and their wetland is expected to decrease 30 per cent by 2011. And population growth rate in those areas is 3.6 per cent for the past five years, which is much larger than 1.9 per cent of national population growth rate. Such intense use and development of river-mouth areas has brought severe damage to most of them. Despite this tough situation, the management of those areas is treated separately by government branches and the effective managerial strategies have yet to be set up.

We classified river-mouth areas into several types to effectively manage them on the basis of their features. First, according to existence and nonexistence of an estuary dyke, we divided them into the artificial river-mouth and the natural one. The natural river-mouth is then subdivided into the tide-dominated delta river-mouth, the tide-dominated salty one, and the wave-dominated salty one by terrain features. And apart from these classifications, the three grade of management are imposed over the river-mouth areas according to the degree of pressure of use and development.

As for the managerial strategies, we specify them according to the river-mouth types. First, for the artificial one, we suggest evaluating economic efficiency of the estuary dyke, improving the operation of the dyke, dredging the river bottom, minimizing the diversion
of surrounding farmland, and developing waterside parks.

Second, for Han River-Mouth, a tide-dominated delta river-mouth, because it is absolutely necessary to conserve it as the only natural one in Korea, we suggest designating the wetland preservation area or the intense managerial area, developing an environmental managerial system, carrying out comprehensive investigations, and making a model of eco-cultural tourism.

Third, for the tide-dominated salty river-mouth, it is necessary to maintain the present wetland area, to develop measures for the management of the existing preserved areas, to induce quota system of the natural shoreline, and to do research on the central government's support for related investigation and research.

Last, for the wave-dominated salty river-mouth, it is desirable to strengthen pre-evaluation of waterfront constructs, to purify the polluted area, and to appraise environmental impacts strictly.

We need to establish rational water allocation principle by permit system and prepare institutional provisions for reorganization customary use of water, promotion of efficient water use and prevention of water conflict. The final objectives of this study are the suggestions of amendment of ‘River Law’ for water allocation system, reinforcement of water use conflict resolution, establishment of watershed management system, etc.
Contents of Study

This study have been carried out focusing on water allocation policy for three years. The first year has been spent for the foundation of introduction of efficient water allocation institution, and the second and third years have been spent for the establishment of water allocation mechanism, suggestion of acts, institutions and policies for the amend of current water related to the laws respectively. Based on each year's objectives, more detailed research contents are as follows.

First, we review current water allocation system and find some of problems such as vague criteria of water allocation, management neglect of customary and vested rights of water use, conflicts of articles of water use rights between 「Civil law」 and 「River law」, environmental water use, and technical problems related to water allocation.

Second, various types of water allocation—administrative allocation, water right, compact between water users, user based allocation, etc.—are examined and applicable factors in Korean water allocation system are suggested, that is, reinforcement of current permit system, negotiation and compact between users and establishment of river basin organization which are selected as the most applicable factors in Korea.

Third, we examine how foreign country's water allocation laws and practices are changed to meet social, economic and cultural change surrounding water.

Last, a new water management organization—integrated watershed management organization—is suggested as the most desirable mechanism for water allocation. Finally, amendment of 「River law」 is suggested to legislate the above mentioned factors to be implemented efficiently.

Results

1) Improvement of water allocation system

- Linkage and enlargement of water allocation organization
  We need to establish a new river basin management organization, and its important
roles are collecting water allocation permit data, establishing and implementing water quality and quantity plans and mediation of water disputes. A three-part implementing strategy is recommended; watershed plan, sub-watershed plan and site management plan. A watershed plan can reflect the broad directions, goals and targets. A sub-watershed plan will confirm the goals and objectives of the watershed plan. A site management plan will present the designs of specific best management practices, subdivision grainage designs and details of enhancement or rehabilitation programs.

- Specialization of Flood Control Office

A water use of surface at Local I, II river level and national river can be allowed respectively by local government and Flood Control office through water budget analysis. But the shortage of water flow data, non-expert of officials, and incredible water budget analysis are obstacles for rational water allocation. We need to enforce and enlarge the functions of Flood Control Office for more comprehensive efficient water allocation at the level of river basin.

2) Arrangement of water allocation laws

- Registration of customary water use

It is desirable to investigate and analyze customary water use and integrate the customary water use into permit system in River law. We do not have a constructed data on customary water use. Therefore, the best way to integrate customary water use into permit system is to accept all of current customary water use. We need a temporary stipulation for registering customary water use. All of registered customary water use allow for 5 years water use temporarily. Temporary water use permit owner should report the amount of water use every year. Based on the water use report, Permitter finally decide the amount of water use permit and notice the users. We need to differentiate the registered customary water use and non-registered customary water use to promote voluntary cooperation of registration.
Improvement of application form and permit processing

The lack of clear water use stipulation brings about water disputes. The suggestions for more reasonable and efficient water use are as follows.

First, we need to improve water budget analysis for more accurate allocation of water permit. The permit of water use should be based on comprehensive and systematic evaluation procedures by research institutes.

Second, we need to break down permit types for dry and normal season to meet the shortage of water. Current water permits are assigned by water use types such as municipal and industrial water, irrigation water respectively. The severe problem is the amount of water permit is more than the available water for dry season. So, we need to substitute seasonal permits or senior and junior permits for current yearly base permits.

Last, more efficient water use is expected when it requires all applicants submit a application sheet with withdrawal point, effluent point and regular monitoring plans. Current application form requires only the purpose of water use and the amount but we need to require more information such as return flow amount and discharge point.

Improvement of water dispute process

All of the water related disputes are handled at the Flood Control Office by the petition of disputers. The Flood Control Office suggests the best resolution alternative through the practice working group. The practice working group reviews the matters of disputes and derives the available alternatives and submits them to the Flood Control Office.
A Proposal for Building Peace Belt in the Western Sea Border Area between North and South Korea

평화벨트 구축을 위한 서해 남북접경지역 이용방안

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The western sea of the two Koreas is in the middle of conflict between North and South Korea. This area has been always a breaking point against the effort of keeping peace in the Korean peninsula. Peace keeping is not a main issue in the planning field. However, peace building can be. Mutual developments of space in the conflicted area, in particular the border region between North and South Korea, may enhance the peace building. This article, in this respect, deals with an area, called ‘Peace Belt,’ that makes peace building in the highly conflicted territory. Several case studies are used for the analysis of peace building in the area. The result of the article indicates that peace building needs a process of mutual peace development in the conflicted sea area through creating common fishing perimeter zone, developing tourist points, rehabilitation of cultural heritage and local cooperation for a zone of life.

Introduction

The western border region of the two Koreas is composed of five islands in the Republic of Korea (South Korea) and coastal areas of the Democratic People’s Republic of Korea (North Korea). Since 1953 after the Korean War, this area has been the symbol of the conflicts between North and South Korea. Geographically, the five islands surround North Korea’s south-western coastal area. In a highly conflicted area, the five islands are areas of strategic importance in military perspective. In the view of North Korea, the five islands are blocking not only its military mobility but also economic activity. Thus, this area is the most conflicted area between North and South Korea.
Recently, inter-Korean cooperation such as Seoul-Gaesung railway-road connection and the Gaesung industrial complex has marched steadily. However, fisheries and the Northern Limit Line (NLL) problem in western sea-coast island area are causing military collisions such as the 1998 west naval encounter and the 2002 sea combat. Since these frequently occurred disputes and series of military tension in western sea area of South-North border line region are becoming an obstacle in promoting of South-North reconciliation, plan preparation for permanent South-North peace entrenchment in this area is requested.

Peace keeping is not a main issue in the planning field. However, peace building can be. Mutual developments of space in the conflicted area, in particular the border region between North and South Korea, may enhance the peace building. This article, in this respect, deals with a space, called ‘Peace Belt,’ that makes peace building in the highly conflicted area. Establishing the Interchange Cooperation Area (ICA) and the Individual Interchange Cooperation Project (IICP) is the main tools to use space in the Peace Belt of the western coastal area of North and South Korean border region.

This research is composed of six sections. After this introduction, the history of the area will explain the geographical location and area history focusing on the conflicts between North and South Korea. Then, the Peace Belt in the border region is introduced as a South Korean national project. After that, case studies of peace building efforts in conflicted areas are examined in researching the experiences of conflict resolution in other countries’ sea border disputes. In the result section, the direction of the ICA and IICP is suggested using the case studies. Finally, conclusion will lead to some issues for further research.

**The Peace Belt in the Border Region**

The Peace Belt is first suggested in the Fourth Comprehensive National Development Plan (2000-2020) in South Korea. The slogan of the national plan includes the notion of integration of the land, the Korean peninsula. The Peace Belt is a spatial plan to practice the integration of North and South Korea.
Conceptually, the Peace Belt is a space especially set up to create and spread peace toward the divided Korean peninsula. It is also a political space consciously and intentionally established to bring peace to the region filled with military tension and to boost simultaneously a peaceful atmosphere. Finally, it is a place for exchanges and cooperation in the Demilitarized Zone (DMZ) and border area between North and South Korea, and a region symbolizing harmony, prosperity and peace, in which the world comes together.

Thus, the Peace Belt aims to systematically prepare for joint utilization of the DMZ and the border area between North and South Korea. This project is to stimulate exchange and cooperation in the border area between North and South Korea establishing a zone of peace and the basis for reunification. Moreover, it is to preserve the natural ecology created in the border areas around the DMZ, discover and preserve historic cultural resources, and jointly utilize natural resources.

The promotion of the Peace Belt project approaches step-by-step process: preparation phase, formulation phase, and completion phase. The preparation phase is when North Korea begins promoting its opening to foreign contacts, generating limited cooperation between North and South Korea. The formulation phase is when North Korea expands the scope of its opening policy, facilitating exchanges and cooperation between North and South Korea. The completion phase is when free economic exchanges and cooperation between North and South Korea take place before political reunification. Specific promotion measures for each phase are as follows:

In the preparation phase, the major cooperation projects include the systematic restoration and expansion of North and South Korea’s transportation network, joint investigation of the ecosystem in the DMZ and border region, designation of the biological preservation areas in the border region, preparation of measures to prevent disasters such as floods and fires, and commencing the Peace Belt project by mutual agreement. It is time to commence the peaceful area formulation by peacefully utilizing the DMZ.

In the formulation phase, the major projects include the creation of cooperation
complexes, and preparation of the implementation measures, joint preservation and utilization measures for major ecological resources, industrial development cooperation, joint investigation and establishment of preservation measures for cultural and historical relics, and expansion of the Peace Belt.

In the completion phase, the major projects include the establishment of the special economic zone, the establishment of the special tourism zone connecting North and South Korea’s famous tourist points, and the establishment of the international peace complex hosting international agencies in the western DMZ to complete the Peace Belt.

**The First Proposed Peace Belt Project**

The first proposal of the Peace Belt Project is suggested in a report, “A Study on the Peace Belt Blueprint in the Border Region in relation to the Reconnection of Gyeongui and Donghae Railroads.” (Kim et al. 2003) The Peace Belt projects in this report mainly focus on the inland area, DMZ and vicinity area.

The proposed cooperation programs’ locations are conceptually based on the promotion of permanent peace and harmony on the Korean peninsula through exchanges and cooperation, maximum generation of the potential in the central area of the Korean peninsula, and preservation of the natural environment, through environmentally friendly land use. Basically, the location of cooperation involves a detailed analysis of the candidate areas in terms of the infrastructure facilities, economic circumstances, and social conditions. Based on conceptual, physical, and individual socio-economic characteristics, Jangdan area in Paju was found to have excellent basic facilities, and Jangdan and Cheolwon areas were both found to possess excellent economic conditions. In addition, Jangdan, Cheolwon, and Goseong areas all displayed superiority in central place functions. As a result of the analysis in the report, three areas (Jangdan, Cheolwon, and Goseong) are chosen to be the Interchange Cooperation Area (ICA).

In addition, the cooperation projects, including the Individual Interchange Cooperation Project (IICP), were chosen specifically based on such criteria as 1) the impending issues which both Koreas have common interests; 2) economic profits stemming from
cooperation between the two sides; 3) preservation of the major ecological, cultural and historical resources; 4) possibility of North Korea’s participation; and 5) impacts on cooperation exchanges and prospects for a peace settlement. As a result, the selected projects include the transportation network connection; joint utilization of water resources; preservation and management of the natural environment; industrial development; and discovery and restoration of the cultural and historical resources.

The Status Quo of the Area (Issues of the Area)

This study deals with the west sea area of the peninsula, while the first Peace Belt project dealt with the inland border area of it. Planners have mostly concentrated their efforts on the land side while the sea side still remained of the 1st importance Although it is hard to treat sea area in the planning arena, the border line is also existent in the sea of the conflicted area. While inland border line is called the DMZ, the sea border line is called the Northern Limit Line (NLL) in Korea. After the Korean War, the NLL is always problematic as for both military perspective and fishing economy between North and South Korea. In this part, the Peace Belt in the west sea area must be analyzed through researching the issues of demarcation line and fishing economy so that the cooperation projects could be examined. The followings are the history, status quo of the NLL and the fishing environment.

Northern Limit Line (NLL)

After the ceasefire agreement between the United Nations and North Korea in July 27, 1953, U.N. headquarters (Mark Clark, U.N. Forces Marshal) evacuated navy force and established current Northern Limit Line including five islands such as Bakryeong, Daechong, Socheong, Yeonpyeong, and Udo on the west coast that is situated north than west extension of inland truce line. While U.N. headquarters reported to North Korea the NLL in August 30, 1953, North Korea did not reply to the request. From that time, the NLL is used as the demarcation line in the west sea of the two Koreas. Since North Korea’s naval power was weak with primitive warships, North Korea may
not need to appeal sea demarcation line. Thus, there hasn’t been any problematic situation in the NLL until the beginning of the 1970s. However, when North Korea imported Soviet Union’s high-speed warships in the beginning of the 1970s, the North Korean government raised the issue of the NLL through continuous invasion of the line. Conflict started and has been unsolved until now(2004).

Although it is still the problematic, there has been an effort to compromise the demarcation line. In 1989, the Basic Compromise of South and North Korea that North and South Korea jointly decided, defined that “the demarcation line is designated as a management region that both Koreas have managed until that time.” This means that North Korean regime approved the NLL to be demarcation line in the west sea area. Though such agreement existed, the conflict has not been reducing in this area. Recently, there were even small wars between North and South Korean warships in 2000 and 2002.

Thus, the NLL is the part of ceasefire agreement, not the part of reasonable compromise by an international law like the United Nations Law of the Sea Convention. The NLL, currently, is only maintained with balance of power, both military and politics, without any visible demarcation line. Probably, a peace treaty may bring a sincere discussion for a demarcation line without antagonistic atmosphere. Yet, a peace treaty needs some actions about peace building between the two Koreas.

**Fishing Environment**

In this area, fishing is the most important foundation for the common economy of both North and South Korea. For both Koreas, the economic size of fishery in this area is relatively smaller than the other areas in two Koreas. But the dependency on the fishing economy is higher. In particular, North Korean Navy depends on fishing in its management based on self-sufficient economy. That is, North Korean fisherman is composed of military personals. Many conflicts take place when North Korean warships protect its fishing activity.

Meanwhile, in these days, ships Chinese ships are coming into along the NLL and
do fishing in this area, and causing additional problem. In 2004, fishing output is highly reduced in this area due to Chinese over-fishing. Since the sea around the NLL roles for nurturing crab, which is the main fishery subject occupying 60% of South Korean crab fishing and obtaining foreign money for North Korea, over-fishing in the NLL has harmfully impacted Korean fishery industries on both sides. Thus, the necessity of marine protected area is also raised up so that both states protect fishery resources and prevent this area from illegal activity of Chinese fishing.

**Area Potentials: Tourism and Haeju Seaport Development**

Tourism is an important part of local economic development in these days. Currently, the most well-proceeded Individual Interchange Cooperation Project (IICP) between North and South Korea is also tourism, especially practiced in Geumgang mountain of North Korea. Recently, in 2004, Geumgang mountain begun to tour through land road across the DMZ, and thus entices much more tourists in the mountain than the time the way is only limited by ship did. Though this area’s tour resource is not so much as Geumgang mountain, proximity to densely populated areas such as Seoul and its vicinity may function this area as tourist points. Furthermore, with the opening of Gaesung Industrial Park in 2004 the tourism in this area has been expected to begin in the near future. The most attractive tour resource in the area is a clean blue sea in Bakryeong Island in South Korea that is the almost only blue sea in the west sea of two Koreas. On the other side of Bakryeong Island, coastal areas of North Korea are traditionally attractive for tourists. Also, historical remains and natural environment in North Koran coastal region are another attractive tour points. Haeju in North Korea is the only middle size city that is the most populated area in the study area. Traditionally, Haeju has been an important seaport, strategic fortress, and the center of local economy. Thus, lots of historical remains and natural resources in Haeju are attractive to be developed for tourist points.

Haeju seaport is currently used for naval base for North Korean navy. Yet, originally it was used for civilian economic activity like trade with foreign countries. As North Korea open the door, the function of this seaport will be very important for North Korean
economy. In particular, as the Gaesung Industrial Park could be main area for manufacturing industries in two Koreas, the function of Haeju will be the center of container seaport with Incheon in South Korea.

**Case Studies of Peace Building Efforts Red Sea Marine Peace Park**

Gulf of Aqaba is the semi-enclosed sea surrounded by Jordan, Israel, Egypt, and Saudi Arabia, located at the north end of Red Sea. (Crosby et al., 2002) Aqaba Bay is mostly composed of more than 1,800m deep sea level, while northern sea level of Aqaba Bay is relatively shallow and forming a continental shelf. In this northern part of Aqaba Bay, reef is well developed. Also, it is the only reef area located at the highest longitude of Indo-Pacific Area.

Based on this beautiful reef resource, Jordan and Israel that share northern Aqaba’s 41km coastal areas, had tried to develop tourism. However, such development had been harmful not only for reef ecology but also for tourism itself. The reef in this area had been too much exploited and polluted by development and abuse of reef by tourists. One country’s coastal development cannot avoid direct harmful effect to the other country’s reef ecology in this area, since two countries share the small area. Thus, both countries need to commonly protect and preserve the reef area in Aqaba Bay so that they maintain sustainable tour development.

In 1994, Jordan and Israel made a peace treaty, called ‘Treaty of Peace.’ In this treaty, article 23 emphasizes Aqaba(Jordan) and Eilat(Israel) for mutual development and preservation such as mutual tour development, common custom, free trade area, air cooperation, and pollution control. In 1996, two countries made another important agreement, ‘Agreement on Special Arrangement for Aqaba and Eilat,’ including mutual efforts to preserve the environment of Aqaba and Eilat such as the Red Sea Marine Peace Park (RSMPP) for the protection of reef eco system.

The RSMPP's main program includes research cooperation for reef-related subject and regulation policies for reef protection. The research cooperation deals with physical environment and the effect of human socio-economic activity to environment and
resources in Aqaba Marine Park in Jordan and Coral Reef Reserve in Israel. These research and policies was coordinated by Aqaba/Eilat Coordination Committee as a RSMPP’s main delivery system. The committee coordinates opinions from Jordan Aqaba Special Economic Zone Authority and Israeli Nature and Protected Areas Agency.

With the aid from international organization, USAID/MERC (Middle East Regional Cooperation), the program begins in 1999. Through this RSMPP program, Jordan and Israel has been making a peace building not only in the Aqaba Bay but also in national level for two countries. (Crosby et al., 2002)

**Fisheries Conservation Cooperation in Bering between U.S. and Russia**

In 1977, U.S and Soviet Union declared Exclusive Economic Zone (EEZ) in Bering Sea. Foreign fishing ships are allowed to do fishing in EEZ, but must crop within the quota given by U.S. From 1984, U.S. even cut the quota and increases joint investment for foreign fishing. In 1988, the joint investment is the only way to do fishing in EEZ.

Foreign ships under this regulated fishing condition go to high sea, Donut Hole in Bering Sea, so that they do fishing for the Alaska pollack, which is a highly migratory fish stock. About 90% of the Alaska pollack is supposed to be originated within both U.S. and Soviet Union EEZ. The U.S. central government felt that they must regulate fishing activity even in the high sea, Donut Hole. U.S. suggested this subject to Soviet Union in 1989 and Russia in 1990. At last, the first Convention on the Conservation and Management of Pollack Resources in the Central Bering Sea was held in Washington, D.C., in 1991, with the participation not only of Russia and U.S. but also from foreign fishing countries such as Korea, Japan, China, and Poland. Although there were lots of struggle in compromising, foreign fishing countries decided to voluntarily stop the fishing activity (Moratorium) in the Donut Hole for two years (1993 to 1994) at the fifth Convention held in Moscow in 1992. Also, Russia and U.S. stop fishing within EEZ at the same time. At the 10th Convention in Washington, D.C. in 1994, long-term regulation program for conservation and management of Bering high sea was compromised among six participated countries.
The principle of the compromised conservation program is to first conserve fishing stock and to second allow fishing based on conservation situation. Every annual meeting decide Allowable Harvest Level (AHL) based on technically examined pollack amount and Individual National Quota (INQ) if and only if pollack amount exceeds 1.67 million tons. Although foreign countries have disadvantages in the high sea fisheries due to strict standard, one thing evident is that coastal countries with mutual cooperation have successfully preserved their fisheries resources against the foreign over-fishing.

Discussion and Conclusion

Building Peace Belt in the western sea of two Koreas cannot avoid sea-related subject such as fishing cooperation and demarcation line on the sea. Though it is hard to connect that sea issue to the planning subject, Korean situation forces to study the most conflicted sea area, and thus complete Peace Belt, which is currently semi-completed in that the Peace Belt centered on DMZ is only part of border area, for the purpose of peace keeping and even further peace building in the border areas. This study suggests that in order to make peace keeping or building in the area, fishing cooperation with designation of common fishing area in the NLL is necessarily demanded at first. Also the conservation of crab resource, which is straddling fishing stock between North and South Korea, is absolutely demanded. In the conservation issue Chinese intervention in fisheries should be dealt with respect to the cooperation of coastal countries, North and South Korea. For the long-term, tourism and the development of the region is another concern for this study, but it is only plausible after some peace building actions between two political regimes.

This study suggests that sea ranch is an imminent task for reasonable use of the sea area for the purpose of both peace keeping and peace building. Since this sea ranch roles both for fishing and conservation, the sea ranch may satisfy two regimes. In particular, for North Korea fishing issue is more important than conservation issue, due to the current economic degradation in North Korea. Yet, the scarcity of crab resource under the over-fishing by Chinese illegal fishing does not allow only the common fishing area.
The scarcity of crab should be overcome by nurturing crab. But conservation by marine protected area demand long-term periods for harvesting crabs, at least four to five years. North Korea economy cannot endure this circumstance. Thus, the sea ranch is chosen for both fishing increase and conservation of crab.

The locations of the sea ranch should be satisfied for both countries. According to survey by Korea Research Institute for Human Settlement(KRIHS) in 2004, the residents living in five islands of South Korea preferred the location between Bakryeong fishery district and Yeonpyeong fishery district. Also, the survey showed that residents prefer the location around NLL. Thus, this study suggests that the most plausible location must be the NLL area between Bakryeong fishery district and Yeonpyeong fishery district. Yet, the location must not disturb North Korea’s maneuvering and bring also its psychological antagonism by blocking all the way along the NLL. As a result, the sea ranch is limited in certain NLL area between Bakryeong fishery district and Yeonpyeong fishery district. Probably, several points between the areas may be designated by two countries’ cooperation.

Hence, the local organization must be needed to create and manage the sea ranches. Research organization should be executed for the purpose of establishing new ranch area. The annual meeting between the two countries is also necessary to decide the final location of sea ranch and issues for future management. Through this delivery system, this area’s peace keeping and building could be dealt in a continuous manner. The experiences of the conflict resolution in the RSMPP and the Convention on Bering Donut Hole explains that such local organization of research and decision making is so much important to maintain and develop the compromise between countries.

As a result, Individual Interchange Cooperation Project(IICP) in the short-term Peace Belt construction in the western sea of two Koreas include creating sea ranches in the NLL areas between Bakryeong fishery district and Yeonpyeong fishery district. Also, creating local organization carrying research and annual meeting between North and South Korea is IICP in the short-term.

In the long run, IICP is related to tourism and area development. The long term peace
building is much related to the Interchange Cooperation Area (ICA), since the ICA should be decided in a way that it is encompassing all the IICP. While the short term IICP provides milestones for fundamental cooperation through accomplishing imminent tasks, the long term issue is related to the regional development. While the former is more likely to be peace keeping, the latter concerns for peace building and even further development for regional prosperity. Thus, the long term IICP and ICA are closely connected to each other.

The long run IICP in this study area concerns for tourism and Haeju development in North Korea. In the case of tourism, the North and South region centered on Backryeong Island is the one spot of tourist points by either ship through Seoul and Incheon or road through Gaesung. The second spot is centered on Haeju. In the case of Haeju, seaport development will help resurrection of the past economic affluence with contributing material movement to Gaesung Industrial Park. Although currently Haeju has a problem of shallow sea height, the present sea sand digging out for the purpose of exporting sand to South Korea may enhance the capability of seaport function if and only if it is intentionally proceeded. That is, in order to be a seaport function, Haeju need some fundamental construction such as digging out sea sand and expanding pier.

Such long run IICPs make ICA area be chosen; North and South area centered on Bakryeong Island and Haeju City. While Bakryeong Island is more focused on tourism, Haeju area is more likely to be complex city by the sum of tour and industrial development. Also, Haeju area includes Yeonpyeong Island as a South Korean counter part.

Until now, given the conditions the IICP and ICA are induced from short and long term plausibility of individual project. However, these projects can be successful under the condition of believes between North and South Korea, and the help from international society.
This study aims to develop strategic approaches to special economic zones in North Korea focusing on the demand and supply factors. In this study, the demand and supply factors were largely defined by inter-Korean economic cooperation and the economic cooperation in Northeast Asia.

The study consists of seven chapters. The first chapter discusses the background and need of the study together with research objectives and methods. This chapter also briefly examines some major results of previous research related with the topic of. This study focuses on Gaesung Industrial Complex, Geumgangsan Tourist Zone, Najin-Sunbong Economic Trade Zone, Shinuiju Special Administration Zone, Wonsan City and Nampo City. Although special economic zones not exist in Nampo and Wonsan, these cities have high potential as new special economic zones. To identify the strengths and weaknesses of special economic zones in North Korea, survey methods are utilized to analyze the market's general assessment on the potential opportunities for SEZs and the major obstacles to developing SEZs in North Korea.

In Chapter 2, achievements and problems of the special economic zones in North Korea are discussed. Confronted with economic difficulties, the North Korean regime has to devise ways to introduce foreign capital and technology through the establishment of SEZs and improved foreign relations. North Korea has endeavored to establish special economic zones in the Najin-Seonbong area since the early 1990s as China did, but the
result is insignificant. It is because North Korea has borrowed the form not the substance of the Chinese special economic zones. Therefore, it is necessary for North Korea to meet the institutional requirements for special economic zones.

North Korea has announced the Shinuiju Special Administration Zone, Geumgangsan Tourist Zone and Gaesung Industrial Zone in 2002 as special economic zones mainly for investment from South Korea and other countries. These moves are aimed at realizing economic gains and the stability of its regime by demonstrating its willingness internally and externally to open its doors to the outside world. At the same time, they signified the North's intention to expand inter-Korean exchange and cooperation. What has been lacking in North Korea's efforts to modernize economic management to date is attention to the role of incentives. To overcome and correct these deficiencies of the North Korean economy, SEZs should be operated and managed with economic rationale and market principles.

There are many lessons that North Korea can learn from other countries' experiences in developing SEZs. Chapter 3 reviews the lessons of transition economies focusing on the demand and supply factors. Two special economic zones of Poland and China are reviewed. In this study, the demand and supply factors of special economic zones of Poland and China are defined as the main factors introducing policy implications for North Korea. Two cases provide a successful example of special economic zone, which has important implications for North Korea. Special economic zones in Poland and China were implemented as a policy tool to achieve the goals of attracting foreign investment.

The Katowice special economic zone in Poland and Shenzhen special economic zone in China give some policy implications for North Korea as follows. First, investment demands of foreign companies must be considered as one of the most important factors for developing special economic zones in North Korea. Second, the active role of the North Korean government is an important factor for the success of the special economic zones. The North Korean government must render a large financial assistance for the development of transport, energy and communication facilities in special economic zones.
North Korea has to be much more active in marketing their special economic zones in addition to building up physical and institutional infrastructure. In order to attract foreign direct investment, it would be better to develop small and medium sized industrial parks in the areas, where infrastructure is relatively well endowed, rather than large-scale special economic zones. Also, they show that adequate infrastructure and locations are important to success of special economic zones.

Chapter 4 assesses development potentials of the special economic zones in North Korea. As opportunities for SEZs North Korea is an emerging market in Northeast Asia. North Korea is actively searching for measures to promote cooperation with China, Russia and the other countries in Northeast Asia in a range of economic fields. With the volume of Sino-North Korean exchanges exceeding 1 billion 23 million US dollars in 2003, China continues to be North Korea's largest trading partner. The North Korean regime must take into consideration the importance of the linkages between Shinuiju and China in the development of the Shinuiju SEZ.

With respect to locational merits of Shinuiju, the city has the potential to develop thriving SEZs through subregional economic cooperation with the Chinese city of Dandong. The development potential of Shinuiju and Rajin-Seonbong can be found in their geographical advantage. Compared to other areas of North Korea, Shinuiju and Rajin-Seonbong have the high possibility for the successful development of SEZs because of their geographical proximity to China and Russia. Countries with high investment potential for Shinuiju and Rajin-Sonbong are China and Russia. The North Korean regime must have considered potential investor candidates.

Weaknesses of SEZs in North Korea are the lack of hard infrastructure, lack of global standards and institutions. The majority of respondents in survey cited resolving nuclear problem(50%), improving hard infrastructure(23%) and legal issues(15%) as largest hindrance to the success of SEZs in North Korea. North Korea is in competition with regions in Southeast Asia and China to attract foreign investment. However, the general investment conditions in North Korea are extremely weak in comparison to those of
Southeast Asia and China. Nonetheless, it is difficult for North Korea to improve its poor investment conditions in a short period of time and create an investment environment that possesses a competitive edge. Under these disadvantageous circumstances, it is important that North Korea utilizes a distinctive strategy for attracting foreign direct investment and the entry of South Korean firms to North Korea.

New policy directions and development strategies on special economic zones in North Korea according to the demand for special economic zones are suggested in Chapter 5. Basic directions for the development of SEZs in North Korea are as follows. First, SEZs should be developed by utilizing investment demands for industrial infrastructure in Northeast Asia. Second, efforts should be made to maximize the advantage of geo-economic potentials of each site. Third, the development of SEZs should be linked to the development of infrastructure in Northeast Asia. Fourth, the development of industrial sites should be a model of restructuring industrial structure in North Korea. Fifth, adequate functions and size should be considered in developing SEZs.

Strategies for mobilizing foreign investment to SEZs in North Korea should take into consideration how to create an attractive environment for investment as well as how to capitalize the momentum of inter-Korean economic cooperation and the economic cooperation in Northeast Asia. The Rajin-Seonbong Free Economic and Trade Zone (FETZ) should be redeveloped as a new center for international trade and logistics. Enhancing the infrastructure should be the first priority for the success of the Rajin-Seonbong FETZ. The Shinuiju SEZ should be developed as a regional center for trade and logistics. In the long run, Shinuiju and the neighbor city, Dandong can be developed as an international trade center together.

Based on the new strategies, Chapter 6 suggests some policy issues of developing special economic zones and South-North cooperation. Preferential treatment should be given to foreign firms entering North Korea and efforts should be made to legally and institutionally guarantee investment incentives provided by policy statements in North Korea. Major obstacles to attracting foreign investments in North Korea such as the high cost of transport, unreliable power supply and telecommunications should be
removed.

In the short-term, policy efforts should focus on making adequate legal provisions for rent or lease of assets such as land, buildings and equipment. What will be necessary is to create basic conditions to attract investment: some transparency, a reasonably clear operating environment, ability to bring money and out of the country, essential financial services, provisions on the arbitration of disputes, etc. The North Korean regime should establish and revise foreign investment-related laws and some special laws for SEZs.

The success of a special economic zone is not guaranteed solely by its geographical advantages. Vigorous efforts of a host country for foreign investment and efficient management of the SEZ should be followed. In this regard, North Korea should accept some elements of market economy especially to SEZs. A free market and private business activities should be allowed in SEZs. In order to invigorate inter-Korean economic cooperation and lure foreign investors into the SEZs, a stable inter-Korean and international relations must be established through mutual trust.

North Korea also experienced the failure of its first SEZ, the Rajin-Seonbong Free Economic and Trade Zone, in the 1990s. In this regard, Shinuiju and Gaeseong should create investment environments that are more attractive than those of competing neighboring regions in China and Southeast Asia. Indeed, there should be a concerted effort by Pyongyang to reduce security instability, which is regarded as a major hindrance to the inflows of foreign investment toward North Korea.

If the North Korean regime is unable to change its negative international image through improving foreign relations, the objectives of establishing SEZs cannot be realized. Therefore, North Korea must show consistency in the process of policy adjustment and economic reform. The successful development of the Gaeseong industrial park and the Shinuiju SEZ would result in a major boost to inter-Korean economic cooperation and create a spillover effect for the rest of North Korea.

North Korea will not be able to mobilize the finances it needs without joining the international financial system. There is no doubt that the North's nuclear weapons program will play a critical role in developing special economic zones. North Korea
should drop its nuclear weapons program. Many US officials have said that the US is willing to help the North if it abandons its nuclear weapons program.

In Chapter 7, major findings of this study are summarized and some concluding remarks are suggested. In order to induce foreign capital to special economic zones, North Korea should make more progress in reform and opening policies in the future. North Korea's efforts to attract foreign investors and increase the management efficiency of the special economic zone are also important for the success of special economic zones of North Korea.

Background
Since 1990s, as the manufacturing industry has been restructured by the change of industrial environment, the existing industrial complexes have to convert from the mass-productive system to the R&D and technology intensive industrial system. The study aims to prepare the methodologies to strengthen the supporting backup functions such as pleasant living spaces which are necessary for high quality human resources to settle down to vitalize the Gumi national industrial complex. To do so, the problems of the existing national industrial complexes are reviewed and the change of the future condition is prospected. Also, the settlement condition of Gumi City is analyzed. In addition, the facilities and functions necessary for the vitalizing the city and settling down high quality
human resources are analyzed. Three sites for development are proposed and evaluated based on the prepared location criteria. The development plan and the action plan are prepared for the selected site as a result of the evaluation considering the introduced functions.

**Summary of Contents**

To accommodate the knowledge-based industry, physical infrastructures such as road, parking lot, green area, and utilities should be established, maintained, and managed by the supporting system. To foster the reputable self-established middle and high school, the sufficient lands should be supplied gratuitously so that students can use the lands as dormitory and sports facilities for horse riding, swimming, and golf at a small expense by benchmarking the domestic self-efficient distinguished private school. Training and convention center for the companies in the industrial complex, stadium, and golf course are arranged to utilize as common facilities. The spaces for exhibition, merchandising, and research facilities are planned where the industrial development linking with the regional development, are made possible by the cooperation among enterprises, universities, research institutes, and the local government. Residential lots are supplied for the rent and sales, a part of which are allocated to the employees of research centers and companies. The sufficient lands for general hospitals, distribution and merchandising facilities and park sites for living conveniences are allocated. Bio-health corridor which is a biological park and sports facility- 25m wide and 7.8km long- is constructed at first in the nation. Because the purpose of development of the supporting complex is to strengthen the supporting backup function for the national industrial complex, the whole facilities for residence, education, training, R&D, medical services, and culture should be linked with the national industrial complex. In this context, it is desirable that the development profit of the site to be returned for establishing the distinguished educational institute. Under this proposition, the project is determined to be economically and socially feasible.
This is the second year study of a three years long research project, a study on collaborative regional development strategy for an integrated national territory. Emphasis is placed on intergovernmental cooperation at regional and local level. The first year study focused on cooperation between the Seoul capital region and the non-capital region. The second year study starts from the presumption that intergovernmental collaboration at regional and local level can be a useful mean to create mutual benefits, both visible and invisible, in various regional development projects that aim to strengthen competitiveness of region. Interregional cooperation that can contribute to social cohesion and territorial integration as well as to sharing experiences among regions is encouraged in Korea and many advanced countries including the European Union.

The study is composed of seven chapters. The first chapter describes the background, objectives, scope and methods of the study. The second chapter examines previous studies and presents framework of the study. The third chapter discusses conceptual basis and theoretical background of interregional cooperation. The fourth chapter is a detailed analysis on the cases of intergovernmental cooperation for regional development. The fifth chapter introduces foreign cases of interregional cooperation and draws implication for Korea. The sixth chapter presents new paradigms and policy directions for intergovernmental cooperation. The last chapter presents a summary, limitation and future areas of research.

Unlike most previous studies relying on theoretical and conceptual approach, this study
develops and employs a detailed analytic method on the mechanism of interregional cooperation. Mechanisms for success and that for failure are drawn from in-depth analysis of projects of interregional cooperation that are already finished or currently undergoing. Spatial scope of intergovernmental cooperation includes inter-local, inter-regional and local-regional cooperation projects. Key research method is a series of interview with regional and local governments' employees.

Inter-governmental cooperation can be defined as intentional activities seeking mutual benefits among regions (or governments) through a division of role to make plan or implement specific projects for regional development. Theories of intergovernmental cooperation include intergovernmental relationship model, negotiation theory, activity sharing model, partnership model and economies of linkage/system. This study aims to establish a theory of interregional innovation system by combining related theories and results of analysis.

The interregional innovation system means a system in which innovations for specialization of region are created under the framework of specialization and integration of distinct innovation clusters, transcending classic regional innovation system focusing on specialization of individual regions. The interregional innovation system is a newly defined concept from this study and can be employed to establish regional innovation system in Korea while resolving structural problems of local governments. The key principle of interregional innovation is the synergy effect that is created by implementing regional development projects with integration and linkages otherwise fragmented and disconnected with limited effects.

Nine projects are selected for detailed examination on the mechanism of interregional cooperation. They include the construction project of a bridge connecting Yeongnam and Honam province, the project to build a health belt across Jeonnam and Jeonbuk provinces, the project to develop traditional medical industries between Daegu metropolitan city and Gyeongbuk province, the project to establish the Daegu-Gyeongbuk institute of science and technology, a big deal on environment facilities between local governments of Seoul and Geyonggi province, tourism exchange program between Chungnam and Jeonbuk.
provinces, area wide development planning among provinces of Gangwon, Gyeongbuk and Chungbuk, balanced development of coal-field areas in Gangwon province, and tourism development program along the Han river covering cities of Seoul and Incheon and provinces of Gyeonggi, Gangwon and Chungbuk.

Implications from the analysis of the nine cases are summarized as follows. First, selection of cooperation project should focus on the possibility of success. This is very important because not all projects can be successful through interregional cooperation. Regarding the nature of project for cooperation, a mix of projects rather than single project or complicated project will face less problems during implementation. If the projects are too complex and unclear in nature compromises and agreement is difficult to reach among regions. In addition, the beginning of cooperation needs to be confined to small projects that are easy to execute. Accumulation of experiences of interregional cooperation and alliance should be important priority.

Second, recognizing importance of cooperation and leadership are also critical elements for success. This is because interregional cooperation requires a break down of narrow-minded regionalism that is often in the mind of decision makers. Actors of participation should form communal senses for common problems and issues on cooperation and alliance. Leadership of the highest decision maker, his awareness of regional issues and the propensity of residents affect success or failure of cooperation. Local officials at lower level of decision making need to exercise more power to lead and make decision during negotiation process.

Third, effective partnership and clear role sharing among participants are indispensable for success. Interregional partnership should be horizontal and eliminate obstacles that can induce excessive competition. Competition for hegemony needs to be prevented by establishing reasonable division of role among participants based on the characteristics of region. Partnership between local government and residents also should be formed to promote peoples' participation.

Fourth, fruits of cooperation should be visualized and shared among participants. Explicit benefits of intergovernmental cooperation such as non-tax revenues, saved budget
and prevention of duplicated investment are important factors that can be used to persuade head of local government and councils. In addition, a common belief on the necessity for interregional cooperation and on the effect of regional government through multilateral cooperation is important motivation for success.

Lastly, institutional support is necessary for coordination of interests and smoothly implementation. One of the most critical issues occurring in cooperation project is excessive competition, which should be compromised by a third party. Arbitration of disputes of interregional governments can be effectively done by the central government that owns finance and regulation as key instruments. The central government should support various forms of interregional cooperation by using financial resources and institutional power. Introduction of model program for interregional cooperation should be considered to diffuse success stories throughout the country.

Interregional cooperation requires new policy paradigms and specific policy measures. The new policy paradigms are consisted of five components. They are: 1) establishment of mutual development paradigm, 2) systematic implementation based on institution and policy program; 3) enforced support and arbitration of central government; 4) networked type of interregional cooperation; and 5) establishment of systematic consensus building process. Combination of these new policy paradigms will reinforce the foundation of interregional cooperation.

Three important policy measures are suggested to promote interregional cooperation in Korea. First, a new policy program focusing on interregional cooperation needs to be introduced. Intergovernmental cooperation for regional development projects requires institutional supports that should be provided by the central government. Existing policies can only provide legal basis for cooperation, lacking measures to support local and regional government. Interregional cooperation program needs to include such factors as the type of cooperation, areas of cooperation, devices securing cooperation, effective implementation system and supports from central government.

Enactment of new law, such as inter-local cooperation act or inter-governmental cooperation act needs to be considered as the legal basis for the new policy program. In
addition, it is necessary to establish the implementation system and assistance of the central government through the revision of existing laws such as the special act for balanced national development and the local autonomy act. Another important area that needs consideration is conflict resolution and mutual agreement, which needs readjustment of existing system and creation of coordination structure. A contractual system of regional development projects between central and local governments, inter-local or interregional governments can promote interregional cooperation.

The central government and regional(or local) governments have to play their role for interregional cooperation. The central government, although not a direct participant, should reform institutional and administrative foundations for financial assistance, settlement of conflicts and formation of consensus.

Local and regional governments have to develop cooperation projects that are important for regional development and have higher chances of success. Establishment of intra-regional as well as inter-regional partnership is essential for the success of cooperation. Last part is to enhance local governments' capabilities for administration and finance. Decentralization of the central government's power and mutual learning of participants are also important agenda for sustainability of interregional cooperation.

Because the outer world get accumulated the diverse layers stained the social,
economic and historic cues, it is certain that landscape has contained ambiguous meanings. In this context, the terminology of landscape has been diversely interpreted by many scholars.

Korean scholars have a tendency to define the landscape as the scenery and landscape paintings with a visual interpretation approach. This approach has been conceptualized in the twofold fields by a visual structure that ought to be affected by the visual distance, angle and points. It could be classified into two branches of the distant view and the near(close-up) view by visual distance. The former is named as the landscape kept the visually long distance from viewpoint to view object, and the latter is named as the landscape kept the visually short distance. This study focuses on the distant-view landscape because it is to be a highly probability that makes an objective observation.

In Korea, the unexploited area of the national territory has been intruded by the newly developing districts during about fifty years. The natural environment has been gradually deprived of its grace and the green of its envelope which has transformed to the gray. Furthermore, the beautiful and familiar image of the national territory has gradually disappeared from our eyes and memory. We have easily made the various-beautiful area into the uniform-disgraceful district.

Now, we should protect the beautiful and familiar landscape from injudicious developing projects and launching under the unstable building and space regulation. We should walk in step with international trends of ESSD for the lasting prosperity of our descendents. In a part of all, we should intend to raise landscape management problems accumulated in the national territory, consider rapid changing, and make some suggestions to solve the problems in the field of national territorial policies and initiatives.

In the first place, we have developed a measurable indicator consulting the existing and emerging phenomena prior to landscape management. This study aims at indicator development of landscape management to manage landscape of the national territory which should be considered in the twenty-first century, named Visual Impact Indicator(VII). So far, in the most contents concerning it, the conceptual and loose planning techniques and
approaches have been mainly applied in many newly developing area.

This study is composed of two phases in macro level. One is a developing VII, and the other is a reviewing VII. In macro level, this study set 5 phases in micro level.

In the chapter 1, an overview of this study has been introduced with a background and goals, method, process and originality of idea, and we have arranged the scope and flow of study. Little by little, it is illuminated that the meaning of landscape has been developed with the visual and perceptual background. Key word in this study is the landscape change. This change goes with a visual and perceptual meaning. To develop an indicator, we have firstly investigated the existing development district and town, and then sought the key problems. Secondly, we have studied the environmental psychology and then selected the visual and perceptual elements related to a equation for measuring the quantity of visual and perceptual transformation.

In the chapter 2, a theoretical review of the concept and variable landscape indicator and directions of landscape indicator establishment have been carried out. Prior to this, we have examined the existing landscape indicator and have studied a theoretical rethinking of landscape management. Main direction for developing indicator of landscape management has been based on the results of professional questionnaires. The five directions for indicator establishment have been proposed. The reasonability of purpose using the indicator, the limit measuring the character of a unique place, the variable selection which composed the indicator, a prediction of landscape management through this indicator, the over simplification of indicator have appeared on a problem awaiting solution.

In the chapter 3, we have named the sum of the physical transformation and perceptual addition for the VII in the long-distance landscape. We have tried to develop the VII measuring of visual condition. Landscape refers to scene, divided line and plane. Plane proportion divided by artificial and natural line and plane is an important factor for landscape assessment. We don't have indicators to measure the visual impact degree with respect to district unit newly developing by urban projects. We have been designed for analytic frame of VII. In this process, the terminology of impact has been defined through
a comparative approach of the similar terms; effect and change. And then an experiment of stimulus and response has been conducted to find out 'difference threshold'. In result, this psychological value has been investigated at intervals of 3 story. This equation of landscape management is below.

\[
VII = \frac{Int(\Delta F)}{3} \times \frac{VI_{strength}}{100} + VI_{strength}
\]

\[
\Delta F = \text{visual quantity of physical change}
\]

\[
N = \text{total viewpoint number}
\]

\[
VI_{strength} = \frac{VI_{total}}{N} \times 100
\]

\[
VI_{total} = \text{the summation of visual quantity in physical change}
\]

In the chapter 4, the inspection of this indicator has been conducted by Arc GIS program of computer simulation tools. For the review of the application probability, we have made 31 simulation cases, based on visual distance, site size, building height, location and skyline. And then the indicator value in one case has been compared with its value in another case.

In the final conclusion chapter, we made a summary. And then we leave the assignments up to the others. If the VII is possibly added up to laws and regulations with the appropriate standards, it would play a vital role in efficient landscape management: the blockage spaces and more openness. This study is contributed to basic study of landscape indicators that visual-perceptual concept is a more efficient indicator estimation than the others.
Background

By the introduction of the Nuclear Waste Management Facilities, regional accommodation system for the expected change of the hierarchy and the role of the region in the national land space and industry was demanded. In addition, the establishment of the comprehensive regional master plan was necessary to maximize the regional development potential as the tourism industry has grown under the situation of regional deterioration. The study aims to suggest the realization strategies for the advanced regional community by maximizing the regional growth and establishing the regional settlement condition through the efficient execution of the national-level mega project and the regional development projects.

Summary of Contents

The objectives and planning subjects for the regional growth were derived from exploring the regional problems and potentials, prospecting the change of the internal and external conditions, and investigating the development demand from the regional inhabitants. In addition, the future vision of Buan was designed as the conversion into the knowledge-based industrial city, the epoch-making improvement in educational condition and quality of life for the regional inhabitants, and etc. The study suggests fostering the high degree knowledge based industry related with the proton synchrotron, forming a R&D cluster with a university, developing a backup supporting city, and development projects for tourism, agriculture, fishery, and living conveniences as the
regional supporting projects. In the spatial development plan by areas, the central area and
development axis are designated and the location and disposition of proton synchrotron,
R&D cluster, new town, and etc. are determined, and specialized development strategies
are suggested. The implementation priority among the suggested projects is determined
and financing strategies and linkage methods with income and welfare of regional
inhabitants are suggested with an investment plan by development phases and project
types. The impacts on the regional economy and land price by the development projects
are analyzed and the systematic improvement for linkage programs with income and
welfare of regional inhabitants are suggested. The study proposes the future vision and
the long-term development directions for Buan as a comprehensive regional master plan
including implementation plan and strategy plan for the realization of the plan. The plan
is expected to be applied to the similar national-level projects and other regional
development plans in the future.

This work intends to discuss the application of the Strategic Environmental
Assessment to the national territorial plan in Korea in order to complement the existing
assessment of environmental impact which is undertaken before a development plan is
finally approved – Prior Environmental Review System(hereafter PERS) – and to
consider sustainability in the stage of planning. This research is organized into 6 chapters.
Chapter 1 presents the research objectives and methods as well as the significances and the scope of this work.

Chapter 2 describes PERS, and present problems inherent in the PERS currently conducted in Korea. The problems are as follows: 1) PERS can be ineffective because it applies not only to an administrative plan but also a development project; 2) when PERS applies to national territorial plan, items and methods employed for the assessment are not specified, thus, PERS cannot be effectively completed; 3) The Ministry of Environment(MOE) in Korea tend to be ambiguous in making opinions, because PERS is not fully equipped with methods appropriate for the assessment and in reality the MOE hesitate to be responsible for PERS; 4) since PERS is literally conducted shortly before final approval is granted to a development project or plan, it is difficult to solve the problems of the project or plan which are pointed out by PERS, and; 5) PERS which applies to national territorial plan(e.g. land use plan) is not conducted in conformance with procedure of planning. In order to overcome these problems of the PERS which are currently used, new appraisal system has to be employed.

Chapter 3 explains the Strategic Environmental Assessment(SEA). SEA means the assessment of environmental impacts which is implemented while a plan or policy is being built. This assessment system points out negative environmental impacts in advance, considers various impacts in a comprehensive manner, make efficient decisions regarding environmental preservation in every stage of planning, makes development plans compatible, and enables public participation.

Chapter 4 deals with a real case where SEA was implemented in advanced countries. Specifically, this work analyzes the sustainability appraisal system of the structure plan built by Cheshire County in U.K. This case has the following implications: 1) when SEA is implemented in Korea, the system's legal basis and application scope are determined by taking the Korean context into full consideration. This is because each county has its own SEA which is appropriate for the country's current situation; 2) as shown in the cases, rationality and unbiasedness of the appraisal system are enhanced via screening and scoping, and public involvement is required in the system; 3) an agency building plans
reports of the results gained from SEA while an agency dealing with environmental
preservation examines SEA, and; 4) Cheshire County's sustainability appraisal shows the
county evaluates the individual specific policies belonging to the structure plan in a
comprehensive manner. This means that SEA is a comprehensive approach to the
assessment of environmental impacts.

Chapter 5 discusses how to use SEA for the national territorial planning in the Korean
context. In principle, guidelines for the appraisal suited for each plan have to be
established in order to implement SEA in the Korean context. And, after experimentally
applying SEA to the planning having priorities, the scope of the application has to be
expanded. In this respect, this research experimentally applies SEA to the City Master
Plan (hereafter CMP), thereby producing guidelines for SEA in the Korean context. Items
to be assessed have to allow for evaluation of environmental impacts and have
environmental friendliness of the CMP. Via matrix technique, details of the plan and the
items have to be linked with each other. And the assessment has to be done qualitatively
rather than quantitatively because SEA mostly deals with the contents of CMP which are
not specific.

A report of the results gained from SEA should be one chapter of CMP because SEA
has to be combined with planning process. Reports of SEA on CMPs should be produced
by local governments, and can be completed by businesses having relevant specialities.
MOE and its regional offices have to examine the SEA reports. The examination can be
assisted by research institutes specialized in environmental issues, and the public has to
be involved in the examination. By summing up the results from the environmental
impact assessment implemented in planning process and relevant opinions gained from
public hearing, local legislature, and local planning commissions, local government fully
write up the reports of environmental impact assessment, and submit them to the Ministry
of Construction and Transportation (hereafter MOCT) in order to combine assessment of
environmental impacts with urban planning process.

Chapter 6 presents some suggestions for efficient application of SEA to the Korean
context. Legal basis for SEA has to be established. For example, detailed guidelines for
SEA have to be put into the Act of Planning and Utilization for the National Territory when SEA applies to the CMP. Furthermore, an organization that assesses environmental impacts in the process of national territorial plan, environmentally friendly management of the national territory should be established within MOCT. However, this work has some limitations: 1) it fails to present not only alternatives enhancing environmental impact assessment system, but also SEAs suited for individual national territorial plans; 2) it does not apply a model for SEA of CMP to real cases. These limitations also suggest further studies for environmental impact assessment.

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**A Study on the Effective Development Strategies of the Surrounding Region of the Daejeon-Tongyoung Expressway**

대전-통영고속도로 주변지역의 효과적 개발방안 연구

_Yang-Soo Yoon, Sang-Wook Kim, Jae-Young Kim, Yong-Woo Lee, Sung-Chan Jo, Tae-Geun Byeon_

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**Background**

The target area of this project corresponds to the neighborhood area of the Daejeon-Tongyeong Expressway, covering Geumsan-gun of Chungnam, Mujugun, Jinan-gun and Jangsu-gun of Jeonbuk, and Hamyang-gun, Sancheong-gun, Jinju, Sacheon, Goseong-gun, Tongyeong and Geoje of Gyeongnam (3 dos, 4 cities and 7 guns), and the planning period is 16 years from 2005 to 2020.

The purpose of this project is to: 1) formulate development plans to maximize wave effects resulting from construction of the Daejeon-Tongyeong Expressway; 2) establish a direction of local development to meet local changes resulting from the expressway construction; and 3) discover leading projects to organize the foundation to formulate a
new national land development pivot and build the basis of local growth in order to encourage the balanced national land development.

Summary

Based on thorough review of basic data on the regional condition, changes in socio-economic environment, home and abroad, and residents and experts surveys, regional development plan of the surrounding area of the Daejeon-Tongyoung Expressway was formulated. Included in the plan are sectoral development plan on spatial settlement system, industrial, tourism, infrastructure development, and conservation of natural environment.

Although the study area has a great development potential, it is not easy to secure economic feasibility of individual projects because most of the area is underdeveloped or stagnant region. Therefore, in this study, a network-type regional development strategy was employed, in which local resources and regional development projects were networked spatially and strategically. Study area is divided into several specialized regions such as the Supporting Innovation Region of Daejeon(Geumsan), Sports-Tourism Innovation Region(Muje, Jinan and Jangsu), New vitality Innovation Region(Hamyang and Sancheong), Advanced Industrial Innovation Region(Jinju, Sacheon and Goseong) and International Marine Tourism Innovation Region(Tongyoung and Geoje).

Based on these development plan and strategies, leading projects and investment plan were formulated and economic and social development effect and implementation scheme were presented.
Currently, military facilities in South Korea have faced with problems such as facility insecurity and operational restriction according to city expansion, the imminent demand of military modernization by old facilities falling behind current military concept, the increase of civil petitions to military facilities, and difficulties to obtain new military land. Thus, this study aims at deducing improvement plan for military facilities in order to overcome these problems.

This study is composed of the present military location condition and problem investigation of military installations, propulsion plan preparation and selection procedure of target military installations for base closure and moving, case studies of focus group for moving military installations, and improving related systems such as laws and regulations.

The spatial scope of the research is limited into state military facilities and military preservation area located at the south of civilian restriction area around the Demilitarized Zone in the South Korean border. The target military facilities for statewide research will be the facilities that each local administration demands to move to military regime, and military regime itself tries to move military bases for military operation and operational efficiency.

In the past, the moving policy of the military facilities started in 1966 with the law of Special Budget for Military Facilities Moving and related laws, moving total 227 military bases till 2001. As a result of moving military facilities, the land use of the military facilities in 2002 occupies 8.2% of the state land, 6,781km² for military
preservation land (6.8% of the state land) and 1,350km² for military facilities (1.4% of the state land). Among these lands, the department of Defense possess 81.3%, while the other 18.7% is owned by either other departments or civilians. The land owning by military division constitutes 66.1% by army, 13.3% by military bases belonged to the department of Defense, 12.6% by Air force, and 7.9% by Navy.

Meanwhile, the total land area by military use has been reduced from 1,455km² in 2000 to 1,350km² in 2003. The main reason is the reduced military practice base causing environmental pollution such as noise and land contamination by military practice. The problem like pollution has been a component that civilians and local administrations around military facilities request moving military facilities in their backyard.

The present condition of military facility movement in this report is examined based on mainly civil petitions. Requested petitions for the movement of military facilities were 66 facilities in 47 local governments among 233 local governments. Among 66 facilities, 50 facilities were selected and analyzed. As a result, 32 facilities turn out to be necessary target for moving military facilities. According to our evaluation, these necessary moving 32 facilities constitute 12 first order facilities that have high possibility of moving, 8 second order facilities, and 12 third order facilities.

The case studies are composed of military facilities in four areas such as Wonju, Namyangju, Chooncheon, and Hongcheon. As a result of the case studies, the six military facilities in Wonju have high potential for moving, while the facilities in the other three areas need long-term research due to cooperation failure between local governments and military side and the change of military plan. As a whole, enhancing moving military facilities depends on reasonable demand for facility size from military side and positive participation and cooperation from local government. Under the situation that there is no specific mandatory legitimate law, the negotiation is only tool to enhance the possibility of moving military facilities.

As a final wrap-up, the improving system for moving military facilities suggests that first of all, military side must establish “comprehensive plan of management of military facilities,” and then propose these demand to the central government. Since the project
of moving military facilities can not be accomplished without huge aid from the central government, the central government need to support military transferring through establishing the new special law for moving military facilities. The contents of the new law should include not only subsidy by government budget but also legitimate land acquisition for military use.

Korea has experienced serious flood damages caused by severe torrential rain and typhoons for the last decade. Moreover, large cities have recently suffered from not only rainwater overflow through sewages from paved space in the rainy season, but also water shortage from drought and water abuse. Accordingly, it is time to prepare some prevention to resolve the negative effects caused by rainwater at urban space.

The purpose of this study is to develop rainwater management and support systems in the field of rainwater utilization facility, storage and infiltration facility. In this study, the definition of rainwater facility is to include the above three facilities. Especially, this study aims to improve the regulations and support system related to rainwater. The finding and conclusion of this study are as follows.

First of all, this study establishes a new paradigm which puts water utilization, flood control and environment together. Based on this concept, the regulations of rainwater are suggested to be revised as follows: the provisions early made by water law will expand...
the scope of application to national land plan law; or it will make a new law for just rainwater management. The result after considering these two methods, a suitable method for effective management of rainwater is going to be enacted as a new law.

On the other hand, rainwater is a very useful and environmental resource. However, it has not usually been used by people in real life because of the inconvenience and economic feasibility. Accordingly, this study suggests several support systems including incentive allowance such as tax and water-supply wage rate reduction and capacity release in building, offer of low rate bank-loan as well as a levy on water-supply use. However, the best way for attractive rainwater management is strongly required to work efficiently in cooperating the above outputs in concrete regulations.

Consequently, under the unstable climate situation for the last few decades, it must be seriously considered by the central government and local governments as well as the public. Therefore, the central government has to establish rainwater law as soon as possible. And then, local government must make a regulation for suggesting the guideline to establish rainwater utilization facilities in such places as house, apartment and small size of building, etc. Simultaneously, the public information and training should be operated to educate people for the significance of rainwater and to install the rainwater utilization equipment in houses and small buildings.
This study aims mainly to develop not only new river-grade adjustment criterion but also river-district decision criterion and system prescribed in river law of Korea. These criteria have not been changed since the river law was established in 1961. In recent years, river-grade and district management which includes 3,893 rivers divided into national river - the first and second local river has not been properly worked to control the whole river system well.

For example, the conflict between local governments has often happened because of the bisection of management right in one river and flood on the joint line of a national river and a local river has been periodically occurred in terms of unbalance of river barrier's height. It is inevitably necessary to include some influences that reflect social conditions and the river's physical appearances such as multi-dam construction, river barrier to prevent overflow, basin facility and so on.

Therefore, this study tried to suggest the alternatives for effective and systematical river-grade and river-district system.

In the first chart, the purpose and necessity of this study are defined and a chart shows the process of sequence in the scope of this study. At the end of this chart, the expected result of the study are briefly anticipated as well.

In the second chart, it consists of three parts, the present situation of river authorized in river law, revised history of river law since 1961 and the problem of river management. The present situation of river authorized in river law is organized in academical concept of law, precipitation patterns in the recent years and the structure of
river. On the other hand, the present situation of river-grade and district authorized in river law is also reviewed and analyzed to find out a solution from problem.

In the third chart, The foreign case studies are surveyed to get some distinct ideas. Especially, three countries, Germany, United states of America and Japan are intensively surveyed. As a result of the survey, some features are drawn as follows. Germany theoretically established river-grade in the early 20 century. The United states of America divides rivers after considering the environmental condition of each river. Therefore, the river which is worthy to conserve, is strictly prevented from any kinds of construction. Japan has a similar situation with Korea. It is very meaningful to survey the system composed by approximately 30,000 rivers. Japan deals intensively with levee areas adjacent to river district for escalating the land effectiveness and protecting the over-flood from a heavy rainfall.

In the fourth chart, there are two parts. the first part is to make the new river-grade criterion. The second part is to make the new river-district criterion and improve system as well. The new river-grade criterion is organized in 12 variables affecting river condition. These variables influence river's peculiar functions; water supply, flood control and river-water environment. The variables selected by delphi survey were divided into four factors; geographical factor, regional factor, natural factor and social/political factor. After classifying the variables according to analytic hierarchy process, they are analyzed quantitatively to calculate relative weight among variables. As a result of the process, it is statistically testified that the most important variable is river- dimension. On the other hand, the new river-district criterion is also prepared to improve the related systems such as notification process, special river-district designation and sustainable conservation of wildlife.

In the fifth chart, a couple of alternatives responding to the problems of river management are discussed. First of all, the new river-grade criterion is applied to the present river-grade system. After adjusting, the number of national river increased from 65 to 462. The first local river also increased from 55 to 368. However, the second local river reduced from 3,773 to 3,063.
In the case of river-district, new additional districts such as special levee management district and environment conservation district are suggested to form inside river-district. These special districts are strongly prohibited from illegal construction and conserved for the wildlife living in river. Also, the amount of compensation is anticipated to be chargeable to the private property according to river law which regulates the owner provision “the nation own river”.

In the sixth chart, it includes the synthetic conclusion. It summarizes the contents of new river-grade and district. Finally, it also announces the restriction of this study caused by time limit and restricted scope.

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A Study on the Northeast Asia Tourism Hub Development Strategies on the Regional Economy and Land Use Change
동북아 관광거점 개발육성을 위한 전략방안 연구
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Background and Purpose

The tourism industry has emerged as one of the major industries that determine competitiveness of a nation or region in the 21st century, particularly posting CAGR of at least 7% in the Northeast Asian and Pacific regions. In addition, the tourism industry's contribution to China's GDP has increased from 10.5% in 2002 to 12.1% in 2004, and that to Japan’s GDP from 8.9% in 2002 to 9.1% in 2004, illustrating that it is imperative to promote the tourism industry as a strategic industry to strengthen the national competitiveness. Thus, it is necessary for Jeollanam-do to preoccupy a leading position as one of the tourism industry's complexes in the Northeast Asia. The purpose of this
research is to find a direction to strategically and analytically grow in order to develop and cultivate Jeollanam-do as the Northeast Asia tourism hub, and to search for administrative, financial and systematical ways to cultivate the Northeast Asia tourism hub.

Summary

Above all, comparative analysis was made on domestic and foreign tourist regions and based on this analysis, Jeollanam-do in order to propose the purpose and basic direction of the tourism development was identified. Accordingly, we derived the vision of "The Marine, Cultural & Ecological Tourism Hub in the 21st Century — Jeollanam-do," was derived and established promotion strategies to develop Jeollanam-do as a tourism exchange hub with the Northeast Asian countries were established. The strategies include development of the international-level tourism facilities, development of specialized local travel products, commercialization of cultural resources as travel products, and implementation of unique tourist's attractions and infrastructure. In addition, we selected a total of 5 locations(such as Yeong-am Marine and Yeosu-Hwayang Complex) were selected as the hub tourism complex to propose a development direction. Also, legal or systematic improvement plans were suggested which include organization of the Northeast Asia Tourism Hub Organization Board(tentative title), enactment of the Complex City Special Law(tentative title), effective cultivation of the hub, administrative supports for the tourism complex development, preparation of the interdepartmental support system, restructuring of the administrative organization, reduction & exemption of local taxes, and enactment of construction regulations within the hub tourism complex.

Based on results of this research, the expected outcomes may include promotion of the Jeollanam-do tourism development project in accordance with changes in the conditions, effective promotion of the project in line with organization of the large-scaled compound hub tourism complexes, suggestion of the actual tourism infrastructure, development of travel routes and product, and proposal of special laws and relevant policies.
This study is trying to present policy measures for the development of industrial capital cities as a strategy of balanced national development and self-sustained localization in Korea. The study covers following areas: theoretical and conceptual foundation of industrial capital cities, implications from model cities both domestic and foreign cities, selection of candidate cities for industrial capital in selected industries and important measures of government policies.

The study is composed of six chapters. The first chapter presents the background, objectives, scope, methods and framework of the study. The second chapter discusses previous studies and related theories, and then sets conceptual foundation of industrial capital city. The third chapter examines model cases of industrial capital cities. The fourth chapter shows examples of how to select industrial capital cities in Korea by employing a model that considers such aspects as hierarchical position of city, degree of industrial accumulation, regional competitiveness and policy factors. The fifth chapter presents basic framework of industrial capital city and specific policy measures. The last chapter presents a summary and future policy agenda.

Background of the study is that it is important to integrate various policy efforts aiming to promote regional industries into major cities as the focal points of localization. Spatial scope of the study covers thirty largest cities in Korea and scope of industry includes manufacturing and service industries at three digits level of standard industrial classification. Research method includes literature reviews, experts survey using questionnaire and statistical analysis.
Theories related to industrial capital city include endogenous regional development theory, innovative milieu theory, world city theory, regional competitiveness theory, theory of accumulation economies and cluster based regional development theory. Important conclusions drawn from the review of theories include the importance of externalities and accumulation economies, environment facilitating learning and innovation through experience and collective production system and enhanced competitiveness. Also, industrial capital cities should be the center of global production and service activities. Building economic and social infrastructure and government's policy assistance are important to improve competitiveness of industrial capital cities.

Conceptual foundation of industrial capital city is centered on spatial hierarchies and functional linkages. Industrial capital city is defined as a city with a high level of accumulation of specific industries and located at the highest position of urban hierarchy owns complex economic structure comprised of a key industry, education and research institutions and business services, exerting strong influence to domestic and foreign regions. Industrial capital city, comparable to political capital city, contains both economic and geographical aspects. Industries are economic basis of region offering jobs and incomes for people's basic living.

Also, industrial capital city is a central place located at the highest position of urban hierarchy. In addition, industrial capital city includes government's intention for balanced territorial development by deploying and promoting various types of industrial capital in selected locations. Industrial capital city, as the locus of innovation and industrial restructuring can contribute to self-sustained localization as well as national economic growth.

Comparing industrial clusters, industrial capital city has a few distinct characteristics. In terms of industrial structure, both have a high level of accumulation in specific areas. However, in terms of hierarchical position on urban system, scale and scope of functional linkages and spatial scope of influence, industrial capital city has much powerful impact. Therefore all of industrial capital cities are a large-scale industrial cluster, but only very successful and few largest clusters can be industrial capital city.
Examples of industrial capital city selected for analysis include four cities in Korea and three cities in other countries. For Korean cases, Daegu as a capital of textile industry, Busan as a capital of marine logistics, Gwangju as a capital of optical industry and Daejeon as a capital of research and development are selected. For international examples, Detroit of the USA as a capital of automobile industry, Rotterdam of the Netherlands as a capital of logistics industry and Tskuba of Japan as a capital of research and development are selected.

Important implications for development of industrial capital cities in Korea are drawn from the examination of foreign examples. Detroit case suggests that accumulation and sustainable growth of specific industries in a certain location demand capable human power, new technologies and infrastructure. Production of high value goods at lower costs is the key element of securing regional competitiveness. In addition, diversification of economic structure is also important to overcome the weakness arising from over-dependence on a single industry.

Rotterdam case shows that a good geographical location explains only part of competitiveness of the city as the capital of logistics industry. Political, economic and social stabilization of the country, efficient financial system and transportation facilities are also important requirement for the capital of logistics. In addition, superior logistics infrastructure and labor power with foreign language skills and work experiences of logistics industries are important factors. In terms of policy, future oriented investment and planning, flexible attitude toward reforming tax and administrative procedure, marketing strategy based on customers’ demand and support from national and regional government are important.

Tskuba case suggests excellent lesson for the development of the capital of research and development in Korea. Tskuba, a research and education city, was developed with relocation of national research and test institutions and growth of Tskuba university. The result is simple accumulation of facilities and manpower, failing to create value added through industry-university cooperation. More emphasis was placed on basic research than on high technologies applicable to industries. If Daejeon to be a world class center of
research and development, clear long-term vision of the city needs to be established. A
dense network and cooperation among government offices, businesses, companies,
research institutions and universities is essential for the R&D capital city.

An analytical model was developed to select candidates for industrial capitals out of
thirty largest cities in Korea, yielding nine cities with highest potential. The model is
consisted of four elements that represent hierarchy, industrial accumulation,
competitiveness and policy factors of each city. Each element was given differential
weight depending on the relative importance. Two solutions were made by differentiating
the weight of each element and both results were considered together to finalize candidate
cities. For industries, twelve at two digits classification were chosen considering spatial
pattern of location and growth potential.

The nine candidate cities for industrial capitals and matching industries are:
Seoul(apparel and knowledge based service industries), Busan(marine logistics industry),
Daegu(textile industry), Incheon(air logistics industry), Ulsan(automobile industry),
Changwon-Gimhae(machinery industry), Pohang(metallic industry), Gumi(electronics
industry) and Gwangju(optical or cultural industry). An exception is Gwangju, which does
not have enough potential as industrial capital city in the twelve selected industries but
was included considering government's strong support to promote the city as the center
of optical and cultural industry.

Promotion of industrial capital cities demands assistance from the government policies.
Basic framework of policy is consisted of six factors: key industry, backward and forward
industries, innovation network, linkage of related policies, business startup and
implementation system. In addition, six policy agenda deserve consideration for the
promotion of industrial capital cities.

First, accumulation and competitiveness of key industries have to be encouraged in the
capital cities. Second, development of backward and forward industries is essential for
sustained growth of regional industries. Third, industrial capital cities should be the locus
of innovation by creating a dense network of businesses, universities, research institutions
and government. Fourth, favorable social environment needs to be made, offering tangible
This study suggests some methods to maintain national rivers more efficiently through the analysis of the present management position in the rivers. The main purposes of the study consist of five sectors as follows. First, it is to establish the concept of river maintenance management. Second, it is to grope for the proper management methods of river facilities. Third, it is to suggest the improvement methods of organization system. Fourth, it is to calculate maintenance cost and seek for several financial support method. Fifth, it is to suggest the improvement methods of law and system in the river.

Chapter one includes the purpose, necessity, flowchart as well as the process of the study. Chapter two consists of the concept and the embodied situations of the river maintenance management.

Chapter three analyses the present conditions of river maintenance management. And the foreign case studies related to river and road are also researched to get useful information. The present condition and problem consists of four parts such as the
maintenance management of river facilities, the organization system of river maintenance management, the budget of river maintenance management and laws related to river maintenance management.

Chapter four suggests the partial improvement methods as follows. First, the items for maintenance management of river facilities are searched and selected. And the field survey has been done to get reasonable data about the check items for facility maintenance, the periodical check time, durability and maintenance cost. The occupation facilities in rivers are systematically divided according to the purpose of designation and use. And then, possession purpose and period, permission condition and criterion are also suggested.

Second, the four alternatives for organization system improvement are reviewed. Alternative one is that the national government supports the local government under the present system. Alternative two is that Han river flood control division extends the range of system to manage more tasks, that is, the national river maintenance management, the investigation and measurement of water. Alternative three is to change the management system like that the flood control division belongs to the local agent. Alternative four is to aggregate the national river maintenance systems and then to establish the national river maintenance system in each district area. Alternative four is much more developed system compared to Alternative one with the manpower, the role and the budget.

Third, the annual budget for national river maintenance management is calculated and the amount of the budget is approximately 2,437billion Korean won. This cost consists of the maintenance cost of river facilities(2,003billion), the management cost of river flow(434billion), etc. The whole cost for the national river maintenance will be procured by the government budget and the fund.

Fourth, the criterion of possession permission, the improvement methods of the existed prohibit behaviour and the principles for possession permission are suggested. Furthermore, comprehensive possession permission can be available to allow several possession facilities all together.
Finally, the last Chapter includes the result of the study and proposes the anticipated studies.

This study aims to analyze the urban-rural and inter-rural differences of settlement environments, to analyze the correlation between regional differences and settlement environments, and then to drive policy implications for the improvement of rural settlement environments. Eventually, it is intended to induce the policy directions for consolidations of settlement environments to increase people's welfare in rural areas and to promote population settlements to rural areas.

The major results are as follows. The execution methods of Korea's territorial and regional development policies have been based on the top-down development till the present, but the trend is changing to bottom-up development. Nevertheless, the poor progress for rural regions and the economic growth based on industrialization which was made by top-down development policy are making the living standard differences between urban and rural regions, the increasing rural exodus, and the rural regions underdeveloped in socio-economic aspect.

In this context, the regional development differences between urban and rural regions as well as between rural and rural regions have been enlarged by the concentration of population in urban area and lack of population in rural regions.
The enlarging development differences between urban and rural regions are caused by insufficiency in the conditions for settlement - the basic settlement environment: housing, transportation, telecommunication, water supply, drainage, informatization, medical care and welfare, education, culture, tourism, accessibility and linkage to metropolitan, school-education conditions - entrance rate to middle, high school and universities, practical education conditions such as library, welfare conditions such as pension, cultural conditions such as literary center and organizations, and finally the medical conditions such as hospital and doctor.

Among rural types, the case of rural type which is comparatively higher than other types in regional development, is insufficient in the school-education conditions - entrance rate to high school and universities, the practical education conditions such as library and lifetime educations, the case of stagnant rural type which is traditionally agriculture-oriented region, is lack in the welfare conditions such as pension, and the medical conditions such as hospital and doctor, the case of dwindled rural type by under population, is comprehensively insufficient in the conditions for settlement, especially in school-education conditions - the entrance rate to high school and universities, the cultural conditions such as literary center and organizations, the welfare conditions such as pension, and the medical conditions such as hospital and doctor.

The followings are the major policy suggestions.

First, the qualitative uplift is more important than physical infrastructure expansion for improvement of rural settlement conditions.

Second, the improvement for housing quality, water supply and drainage, and medical care and welfare should be done by the concept of basic needs fulfillment for rural people.

Third, the uplift for informatization and the expansion of medical care and welfare for the aged is urgent because the trend of information-intensive and aging society is proceeding.

Forth, rural people strongly ask for the improvement of education environments, cultural and residential conditions, etc. Thus, the central government should take priorities
in these policies for rural people.

Fifth, in carrying out policies for improvement of rural settlement environments, the government should take into account the differences among each rural type's settlement environments, and especially the aged in the stagnant rural type.

Lastly, to notify the rural people the details of the policy is important in establishing and driving rural development policy. And the policy direction for the regional development has to be changed to enhance the participation of regional governments and residents and their leading role. And it is necessary to establish and drive policy by adjusting and coordinating each other in the consistent, well organised and comprehensive method rather than separate and disperse method.
recommended. This study, hence, aims to find the practical solution for the compound tourism/leisure complex in the real tourism industry associated with the recent government proposal, the Compound Tourism/Leisure Complex(City).

Summary of the Contents

This research has been accomplished by cooperative work of Korea Research Institute for Human Settlements(KRIHS) and Korea Culture and Tourism Policy Institute(KCTPI). The research composes of the change of the foreign and domestic circumstances, the concept of the compound tourism/leisure complex, foreign and domestic case study according to the concept, the current problem of the practices in the compound tourism/leisure complex, and finally suggestion of improvement plan in the legitimacy and others.

First, the compound tourism/leisure complex is a new concept in the field of tourism development and should be explained in the introduction of the concept. This research examines the concept through various secondary resources such as books and articles, and through practical primary resources such as mail survey for experts, public hearings for the public, interviews, and several expert meetings. The case studies deal with some famous tourist regions such as Cancun in Mexico, Disneyland Resort Paris in France, New Jeju City in Korea, and so on. Through the case studies the study found that the compound tourism/leisure complex should be accomplished by selected and concentrated strategy and public-private partnership in the large size tourism development.

Next, the current situation and limitation of the compound tourism/leisure complex and the problems are examined. Finally, institutional improvement plan to overcome the current problems is suggested through expert mail survey and meeting in terms of the institutional improvement for project financing, location condition, development procedure, etc.

Therefore, the main contribution of the research is to establish a brand new concept of the compound tourism/leisure complex, to suggest future direction of tourism development and institutional improvement plan. The “Special Law of the Compound Tourism/Leisure Complex” is expected to be a useful tool for the development of tourism in the future.
Tourism/Leisure Complex”, associated with the personal and central government, will be established.
Urban and Regional Planning
In line with the progress in globalization and decentralization, the trends of new regionalism have emerged as a powerful driving force for regional and national development. The Participatory Government has set up the balanced national development goals as the foremost national agenda to enhance national competitiveness and to sustain economic development in a rapidly changing economic and social situation. The Korean government is seeking to overcome the imbalance in the national territory stemming from the compressed economic growth and to create regional innovation system for national development. This research is intended to build a regional governance system and to propose an appropriate institutional framework which efficiently implements the balanced national development programs and projects at a regional level.

In this study, we examined the characteristics and problem of current regional governance system involved with the implementation of regional innovation programs and projects which were financed under the National Balanced Development Special Act of 2004. We also reviewed major governance systems for regional economic development in the U.K., France, and etc.

This study suggests a policy direction for the integrated governance system and proposes an organizational framework which can be effectively operated in the particular situation of central and local government system at a regional level. It suggests that current provincial government should be utilized as the main regional development agency for a short period of time. For a long-run, it is advisable to establish an independent regional development agency such as RDAs found in the U.K. and elsewhere in the E.U.
Furthermore, this study suggests that the Korean government set up an institutional framework and social conditions as a top priority, which promote the horizontal cooperative relations and networks among various organizations and interest groups related to regional innovation and economic development at a regional level.

The self-sufficient new town development through the private enterprise's participation in development process is a newly devised city development method that is able to complement a weakness of the existing new town development, to promote a diversification of developers, and to make a planning establisher pursuing a self-sufficiency reflect a enterprise's demand from the initial stage. It is a conceptually desirable way to build the private-public cooperation model to enable the public sector hosting the common good-oriented urban development to joint with the private sector chasing the economic profits. This study is aimed at drawing out a scheme for the private enterprise's participation in new town development, as a new development body, which seeks a balanced development of the nation and a promotion investment to local cities based on the city's self-sufficiency. And also this study intended to project a new typology of new town development to contribute to the economic revitalization and spatial differentiation of a city by way of the diversification of city developers. With a viewpoint of accomplishing the self-sufficient new town(namely, company town) development this
research presented a detailed policy scheme to realize the company town as a new approach to organize development bodies.

The results of this study are as follows. The review of domestic and abroad cases relating to company towns showed that the company town started from the Factory Town in Europe and the early industrial cities in America appeared just after industrial revolution. The current company towns have been evolved from the industrial clusters in framework of a cooperative relation between a company and a city. Therefore, the cooperation between the private and public sector is a desirable model to accomplish the self-sufficient new town development through the combination of city side's publicity and private side's economic vitality.

The company towns can be classified into 3 types considering industrial activities and land use forms. These are the Facility-Set Industry Type (FSIT) with a dispersed land use of low density, the Knowledge-Based Industry Type (KBIT) with a compact land use of high density, and the Tourist Industry Type (TIT) with a land use in harmony with nature. The indicators of Minimum Industrial Area (MIA), Industrial Area Ratio (IAR), Minimum Employed Population (MEP) and Direct Employment Ratio (DER) corresponding to each types can be drown out as below. First, in case of the FSIT new town, the DER is 15-20%, IAR 30-35%, MEP 10,000 persons., and MIA 1,000,000m². Next, in KBIT case, the DER is 15-20%, IAR 5-10%, MEP 3,000 persons, and MIA 165,000m². And finally in TIT case, the DER, IAR, MEP, MIA is 5-10%, 65-70%, 3,000 persons, 6,600,000m² respectively. The indicators relating to industrial area and employment are not only applicable to the main planning indicators but also utilizable to basic information of land use plan in the process of actual development of the company town.

The planning indicators concerning the actual realization of the company town concept onto the physical urban space are deeply related with Korean 2nd age new town development policy of these days. So, this study drew out 3 sectors' planning indicators pertinent to economic, socio-cultural, and environmental sustainability. The indicators securing the economic sustainability are self-sufficiency related facilities construction, employees' ratio, designation of development reservation area, including industrial area.
The indicators attaining the socio-cultural sustainability are residents' participation, community built-up, public space design, cultural activities, urban landscape planning, and etc. The environmental indicators are pertinent to proper density, nature-assimilated development, mass transportation system, pedestrian-friendly urban structure, renewable energy introduction, green spaces and parks system, and etc.

This research proposed a institutional improvement measure on a retake of private development gains to help a self-sufficient new town work as a regional specification city. And another measure on the establishment of the various development bodies such as 3rd sector, regional development corporation owned by the local government, not only confined to private enterprise was explored.

This study showed the new way for a private company to participate in the self-sufficient new town development. Though the main focus of the study was laid on setting of the basic company town types such as FSIT, KBIT, TIT, another various mixed types are expected to appear in reality, which is the limit of this research. To advance this point, the researches of hereafter need to develop the various methods on enterprise's participation and to search for indicators on mixed types except 3 types mentioned above.

II - 3

Delimitation of Urbanized Areas in Korea for the Collection and Dissemination of Local-level Data
지역통계생산을 위한 도시화지역 설정
Kwang-Ik Kim, Byong-Nam Choe, Pilk-Sung Byun, Hye-Young Joo

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In 1995, the reorganization of the Korean administrative areas produced not a few ‘urban-rural combined’ cities. Since then, the existing definition of an urbanized area in
Korea has become ambiguous. According to the definition, ‘Shi’ (a city as an administrative area) having more than 50,000 residents is equated with an urbanized area. Due to the existence of urban-rural combined cities, such an administrative area is not always equivalent to an urbanized area.

In order to confront this possible mismatch, this research intends to discuss and present a method for the delimitation of an urbanized area in Korea. Concretely, we examine urbanized areas of other countries, such as U.S., U.K. (England/Wales and Scotland), Australia, and Japan, delimited for varieties of public purposes. From this examination, several criteria are selected. Then, they are experimentally applied to three localities as case study areas; Gwangju, Sooncheon, and Yeong-am in the Honam region of Korea.

The countries this research considers (except England/Wales), set the boundaries of urbanized areas on the basis of the basic spatial units for survey or publication of data (especially, census data). More importantly, the countries use variables indicating the urban characteristics in such basic units to delimit their urbanized areas; U.S. employs only population density while Australia, Scotland, and Japan use land use features as well as population densities.

Similar to these countries, this research uses the Basic Unit Block (hereafter, BUB) for the Korean Census survey as the basic spatial units for delimitation of urbanized areas, and investigates demographic and land use features in every BUB of each case study area. In detail, we examine population density, percentage of area covered by buildings and percentage of public facility area, respectively in each BUB.

Finally, our research presents a method by which an urbanized area in Korea can be delimited. The delimitation should be conducted in the following procedure.

First, all the BUBs which meet at least one of the following three thresholds are regarded as ‘urban BUBs’: 1) population density should be more than 3,000 persons/km²; 2) Percentage of building coverage should be more than 10%, and; 3) Percentage of public facility area should be at least 50%.

Second, a criterion of contiguity is set, and then applied to such urban BUBs. A group of urban BUBs which are physically contiguous, including BUBs surrounded by the
contiguous urban BUBs, is considered as a ‘candidate district of an urbanized area’ (hereafter, a candidate district). Unlike Japan, U.S., U.K, and Australia, Korea set contiguity thresholds via critical distances. However, since core portions of built-up areas are generally and physically connected to peripheral portions in Korea, physical contiguity is selected as the second criterion for the delimitation of an urbanized area in Korea. This criterion literally does not rely on any critical distance.

Third, as a final criterion, a population threshold is applied to candidate districts. Stated otherwise, only the candidate districts which satisfy the population threshold are finally designated as urbanized areas. The countries under consideration in this research employ various population thresholds, which are proper for the countries’ specific contexts:

1) U.S.’s urbanized area and urban cluster each respectively have at least 50,000 and 2,500 people
2) Japan’s DID (Densely Inhabited District) has more than 5,000 people, and
3) The minimum population is 1,500 people for the urban settlements of England / Wales.

Our selected population criterion is that the total number of residents in a candidate district should be 3,000 or more. In Korea, this standard was used for the designation of ‘Myeon’, urban planning district, and indicates the minimum population of a neighborhood in a multi-family housing zone. Additionally, if necessary, multiple types of urbanized areas can be used. For instance, a candidate district having at least 5,000 or 10,000 people and a district with between 3,000 and 4,999 people can be designated as an urbanized area and a quasi-urbanized area, respectively.
Although Paju City has a great potential as a central city in the northern part of the Seoul metropolitan area, the included areas have been prevented from active developments, due to the special location, which is close to the Demilitarized Zone (DMZ). More specifically, various conventional regulations by Capital Region Improvement Plan and Military Facility Protection Area, have led to great disadvantages in growth management of Paju City, in terms of imbalanced development between cities and stagnation of regional industrial development.

Recently, due to a reconciliation mood between the South and the North, the U.S. administrative government is shifting the military strategy in Korea, loosening regulations in the existing Military Facility Protection Area. In the line with this movement, Korean government begins to support development of the DMZ proximal areas, and many private construction companies are involved in development of this area. In Paju City, several parts of the U.S. military facilities will be completely withdrawn from the main city areas, as of 2005.

Under the circumstance, this research is targeting establishment of the development strategies for sustainable development of Paju City, preventing from the leapfrog type of development in this unfilled area.

This research includes 4-step processes as follows:

In the first step, to establish the deployment plan of the scattered chartered areas, an induction-encouragement function is deducted, setting the phase of Paju City in the levels of nation, metropolitan area, and City, analyzing present development conditions, and
suggesting future development conditions, from the macroscopic and long-term view.

In the second step, the plans for development and practical use of returned chartered areas in foreign cases are reflected in this task throughout the literature review and benchmarking. In addition, an induction-demanding function is deducted, through a survey of resident opinion.

In the third step, an induction-possible function is deducted using the demand analyses of induction-encouragement function and induction-demanding function, and establish a practical plan to materialize the function for Paju City Comprehensive Plan.

In the fourth step, an achievement plan is established combining the comprehensive plan of each returned area, and the plans for achievement priority, the main body, strategy, methods of revenue rising, are provided.

Throughout the above process, several suggestions by six different camps are provided: administration-town for the Camp EDWARD, residential and commercial areas for the Camp GIANT, residential and cultural areas for the Camp GARRY OWEN and the Camp GREAVES, commercial and industrial sites for the Camp STANTON, and education and venture sites for the Camp HOWZE.

The plan is suggested to be executed by the governmental body between 2007 and 2013. The Camp HOWZE will be developed according to demand, because this area is designated as a City Arrangement Site.

Although this research provides a concrete plan, more specific guidelines of the sites are supposed to be provided later. Moreover, to make each site to be a functional center of the region, it is necessary to establish and manage the site plans. In case of establishing the comprehensive plan, transportation networks must be considered. Finally, since the plan for drill grounds has not included in this research, it should be also considered in the plan.
This study is to state the objective of upbuilding the new Busan Port into a base of marine affairs and sea transport by designating the Busan-Jinhae area as a Free Economic Zone. This study is a legally designed scheme based on the law of Free Economic Zone Designation & Operation which includes the overall development overview details equivalent for 5 districts, 11,640 thousand pyung, among the target area 31,540 thousand pyung as well as strategic plans to motivate foreign investment and design residence for foreigners. Thus, it not only contains conceptual guidelines declaring directions but also practical tactics.

The 1st book of this research covers the basic concept and strategic system and the 2nd, plan per sector such as land use, transportation system, industrial development and environmental preservation.

Chapter 1 of the 1st book describes the background in general and the free economic zone designation feasibility by pointing out features of the free economic zone, why free economic zones are indispensable to the nation's tactical affairs, the status and competitiveness of the Busan-Jinhae Free Economic Zone, the increase of sea transport and logistic demand and counter-measurements and etc.

Chapter 2 specifies the free economic zone's current situation and conditions to act as the logistic hub of international trades, development potential and constraints, upper level and relevant policy review, introductory functions and demand analysis, development goal and direction, development methodology, blueprint of basic deployment and etc.

Plans to derive foreign funds into the FEZ, successful ways of organizing foreign resident
areas and etc together with personnel preparation, fostering plans and specific targets to
focus on and public relation applications for marketing are covered in chapter 3.

The last chapter seeks for a feasible way of achievement for the Busan-Jinhae FEZ
by dealing with operation system and contractor relations, fund-raising and investment plans,
managing system, economic influence and balanced advancement effect and so forth.

Meanwhile, the main contents of the 2nd book are population receptiveness, resident
facility creation, land development plans, industrial development, traffic system set-up,
energy supply treatment and coverage, founding health, education, welfare organizations
and environmental preservation which also include first-priority development sections such
as candidate spots for new port constructions, Busan science park, Sinho industrial district
that are first listed in the FEZ development map.

As Asan city is neighboring the Capital region, its development potential is regarded
to be high. However, it has long been underdeveloped due to the shortage of
transportation networks. The recent structuring change of external conditions such as the
government plan for Asan-new-city development plan, new administrative city plan,
relocation of public institutions from the Capital region, and high-speed train network has
dramatically increased the development demand of Asan-region.

Under these circumstances, it is necessary to prepare mid- and long-term development
plan for the harmonious growth of Asan city, and also it may be a guideline for setting up various action plans and management of municipal affairs.

This study consists of six chapters, and main contents are as follows.

In chapter 2, the study has reviewed conditions of Asan city in terms of socio-economic and natural environments such as history, location, population, land use, transportation and so on. It also inspects various spatial and economic development plans related to Asan city. Based on the examinations of current conditions, it shows SWOT analysis which suggests strong and weak conditions of the city and opportunities and threat points for the development of Asan city. This chapter also presents the survey results of Asan citizens on the vision and development directions of Asan city.

Chapter 3 identifies desired future goals which include vision and development directions, development strategies, principal planning indicators and formation of future spatial structure. The vision for Asan city suggests “Asan Green Digital World City”. For the realization of the vision, main planning indicators such as population, employment, land for industrial development, etc. have been presented. In order to reach desired future goals, seven development strategies, which are supplies of infrastructure for high-tech industries, promotion of tourist industry, high-value-added agriculture and rural development, new road construction, planned management of land use system, protection of landscape and environment and lastly promotion of welfare of residents are suggested. In terms of future spatial structure, it suggests three key spatial strategies- urban development, industrial development and green track development.

Chapter 4 concerns with the practical development action plans for the seven development strategies. Chapter 5 presents development directions for each region of Asan city, which are Onyang-dong, Yumchi-myun, songak-myun, Baebang-myun, Tangjung-myun, Eumbong-myun, Dunpo-myun, Youngin-myun, Inju-myun, sunjang-myun, Dogo-myun, and Shingchang -myun.

Lastly, chapter 6 pays regards to the various aspects of guidelines for building urban and other planning, administrative and legal process, and cooperative participation of citizens and so on.
The Korea government aims at establishing Korea as a Northeast Asian logistics hub of the 21st century. Accordingly the government has designated areas with the large economic synergy effect as the Free Economic Zone (FEZ), so as to attract foreign investments. Assignment of FEZ is intended to choose key areas from the national survival strategic perspective, concentrate the national competencies, and develop Korea as the Northeast Asian logistics hub.

The Gwangyang Bay Area has a population of at least one million and 51 cities within the radius of 1,200km. Thanks to opening of harbors and expressways, the area takes up a highly strategic location, and offers a favorable location to logistics-related industries such as storage, redistribution, packaging and processing of the transshipment cargo. In addition, the area is close to Gwangyang Steel Mill and Yeosu National Industrial Park with the possibility of making a cluster of the Northeast Asian logistics hub of petro-related industries and steel.

This study is designed to draw up development plans for the Gwangyang Bay Area as a FEZ, focusing on the creation of international business and living environments based on the potential of this area. The area is envisioned as a strategic bridgehead for foreign and domestic companies to expand to the Northeast Asian market.

Gwangyang Bay Area’s Vision & Development Concept

The Gwangyang Bay Area Free Economic Zone (GFEZ) aims to become a Northeast Asian hub of logistics, advanced industries and tourism leisure. To achieve this vision,
a basic development concept is to set up the international logistics operation functions, restructure the existing industries, cultivate related industries, and attract new industries such as the fine chemical and new materials. Particularly, would class residential, education, medical and business services will be provided to attract domestic and foreign professionals.

The Gwangyang Bay Area Free Economic Zone will be developed as a FEZ with multiple functions including logistics and production, in particular petrochemical and steel industry, and support functions.

**Land Use, Population, Housing & Transportation**

The Gwangyang Bay Area FEZ consists of 5 districts and 24 zones with the total area of 88.98km² of which the industrial & logistics areas occupy 38.7%, commercial & business areas 2.8%, public facilities & open spaces 46.1%, tourism & recreational areas 7.1%, and residential areas 5.3%.

The target population in 2020 is 111,000 persons. To accommodate the target population, 37,000 houses will be built in phase through 2020. In order to efficiently provide transportation of the Gwangyang Bay Area, 2 expressways, 9 national highways and 21 routes within the district road network will be either newly constructed or expanded. In addition, the Jeolla Line, Gyeongjeon Line and Seonam Line of the railways will be newly added, renovated or double-tracked and a new railway passing the Yulchon Industrial Park No. 1 will be built. The Gwangyang Port will be expanded to have 33 berths(9.33 million TEU) by 2011, and the Yeosu Airport will be expanded by 2010 to have a runway of 2,800m×45m.

**Development Direction by District**

The Gwangyang District(12.90km²) is designed to facilitate transshipment cargos around the Gwangyang Harbor and in particular a logistic function to serve as the Northeast Asian hub of steel-related materials and nonferrous metals. The Yulchon District(28.15km²) is mainly designed for a production function by attracting factories
related to basic industries such as the petrochemical and steel, and partly designed to stimulate the Yeosu Airport and container port. The Sindeok District(25.47km²) will accommodate supporting functions for the Gwangyang Bay Area FEZ, including residential areas equipped with high-quality educational, and medical facilities. The Hadong District(12.56km²) is designed to accommodate an industrial function related to steel production and some support functions such as business and recreation. The Hwayang District(9.9km²) will be developed the strategic point of the South Coast Tourism Belt, accommodating tourism, sports and recreation functions to support the FEZ.

**Business Plan by Phase**

Phase 1(2003 ~ 2010) will focus on leading functions such as logistics and production functions and supporting the infrastructure. Phase 2(2011 ~ 2015) is planned to accommodate additional logistic, distribution and production functions and to encourage support functions and the facilitation of foreign investment on the basis of the leading functions developed in the Phase 1. In Phase 3(2016 ~ 2020), the Gwanyang Bay Area FEZ will achieve its development targets regarding basic urban facilities so as to, attract the international-level companies and organize the international living conditions.

Planned through 2006, the Phase 1-1(25.40km²) has 6 zones that will be preferentially promoted, including the Gwangyang container port(5.16km²), Gwangyang port's Hinterland Phase 1(1.95km²) to attract logistic functions, Gwangyang POSCO steel CTS(0.62km²), Yulchon Industrial Complex No. 1(9.16km²) to attract the industrial function, the Sindae Hinderland(2.91km²) for housing & support functions, and the Hwayang zone I(5.6km²) for tourism, recreation and sports.

**Target Industries**

Phase 1 will focus on international logistics(boosting the international logistics function of Gwangyang Port), R&D centers of the existing industries(enhancing the Gwangyang Bay Area's industries), manufacturing businesses expanding production contain the area, education & hospitals(attracting international-level investors and branch hospitals), and
tourism & conventions (developing the international marine recreation complex in the Hwayang District). Phase 2 aims to add financial and future strategic industries to the industries of the Phase 1. Lastly, advanced knowledge services use intended to be promoted in Phase 3.

**Policy Implementation to Secure Actual Usefulness of Free Economic Zone**

To facilitate the development of Gwangyang Bay Area Free Economic Zone, the study suggests the following: First, the Gwangyang Port should be built as early as possible. Second, preferential projects should be undertaken to initiate the development process FEZ. Third, an effective promotion system must be instituted. Fourth, business and living environment should be greatly improved. Fifth, solvency the central government agencies should render strong supports. Sixth, These should be aggressive marketing strategies. Last, a mediation system should be established to coordinate different of diverse groups surrounding the development of Gwangyang Bay Area FEZ.

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**The Evaluation of Local Capacity for the Self-sustaining Development in Korea (I)**

저립적 지역발전을 위한 잠재력 분석연구(I)

*Tae-Hwan Kim, Kwang-Ik Kim, Seung-Han Ryu, Pill-Sung Byun, Seungh-Mi Hwang*

RR 2004-19 · December 2004 · 243 pages · Korean

This study intends to evaluate capacity or potentiality that each locality possesses for self-sustaining development, and present an analytical framework of the local capacity or potentiality. The study is based on the following recognitions: Local development, including goals, strategies, and implementation plans to be built upon the specific capacity
or potentiality of each locality. Equally, each jurisdiction has to have a different prospect of development given its specific capacity. Stated otherwise, this work deals with significant issues of local development: what potential is required for each locality's self-sustaining development, how the potential should be analyzed, and what local development strategies and policies should be built up given the potential. Based on these issues, we critically review the existing literature of local competitiveness and potentiality, and then evaluate development potentials of local jurisdictions. Significantly, the evaluation includes a national-scale exploration of the jurisdictions' conditions involved in local development, which uses social and economic data of the 166 jurisdictions in Korea. And as the other part of the evaluation of local potentials, we undertake a comparative case study which functions as an exemplar work for this research's portion of 2005.

The main findings of our work are as follows: First, the work finds out the Korean localities show a spatial disparity in development capacity: localities having high-level potentials apparently agglomerate in urban and industrialized regions while local jurisdictions with low-level potentials are located in typically rural regions. The former group encompasses the Capital region, the localities (e.g., Chuncheon, Daejeon, Chungju) contiguous to the region along three different corridors, the southeastern coastal belt (extending from Pohang to Yeosu, Kwangyang, and Suncheon), Daegu and its surroundings (e.g., Gumi), and other cities functioning as regional centers (e.g., Jeonju and Jeju). The latter group is composed of the rest.

This spatial contrast is figured out from the spatial patterns and inter-regional comparison of the index calculated to evaluate the total development potential in each locality. The calculation of the index uses both 31 indicators displaying various potentials in individual jurisdictions and the weights representing the degree of these indicators’ contributing to local development. In other words, the indices are weighted averages of all the 31 indicators. Additionally, the indicators are used because they mostly have significant positive correlation with at least one of the local development variables which include annual population growth (2001 ~ 2004), annual employment growth (1996 ~ 2002), annual average of per capita income (2000 ~ 2002).
Second, the 166 localities are clustered into five groups (Types 1, 2, 3, 4, and 5) by applying K-means clustering algorithm to the indices that evaluate development potential of each local jurisdiction in four different aspects (economic performance or base, innovation resources, socio-cultural infrastructure or resources, and quality of life or amenities). Localities of each group are assumed to have similar structure of development capacity. However, the five groups in general demonstrate different degree of development, particularly in terms of the three variables - population growth, employment growth, and per capita income. Simultaneously, these five groups display different level of total development potential. Specifically, while moving from Type 1 towards Type 5, we find out that each group's mean value of index showing total development potential is on the decline.

The mean index values of Types 4 and 5, respectively, are below the average value for the 166 local jurisdictions. Moreover, in the process, the proportion of “Shin-Hwalryeok” jurisdictions in each group is on the increase. Additionally, the spatial distribution of the five groups almost corresponds to the spatial pattern of the index indicating total development potential. In particular, the distribution of Types 1, 2, and 3 nearly overlaps the distribution of localities having high and mid-range values of the total development potential index. These two disparities in the development level and the potential index value among the groups imply the level of development potential has likely influenced the degree of local development.

Third, when exploring the relative position of the localities within each group, there is likely a structural disparity in the level of development within the group. The jurisdictions which show relatively high and low values in both one indicator of local development and the index of total development potential tend to have relatively high and low values, respectively, in the other indicator of development.

Finally, the comparative case study of two rural localities' festivals (Song-i Mushroom Festival of Bonghwa and Butterfly Festival of Hampyung) demonstrates that institutional capacity (or social capital) of a locality may well be as significant for local development as other potentials are. Stated otherwise, the case study implies that the analysis of local
potentials for self-sustaining development has also to encompass the qualitative aspects of development potentials. Since such aspects are difficult to analyze by using indicators or indices, intensive and comparative case studies of diverse localities are needed. In summary, the evaluation of each locality’s development capacity has to be based on not only indicators or indices quantitatively displaying potentials but also intensive analysis of qualitative components such as local institution and culture, given the comparison with other competing jurisdictions.

This research has the following implications and significances. First, this study is of significance in that it provides an analytical framework for development capacities or potentials of localities. This framework shows each local jurisdiction’s weaknesses and strengths in comparison to other competing localities, i.e., each locality’s relative position in development capacity or potential. In this respect, this study’s empirical portion (Chapters 4 and 5) functions as an exemplary method to analyze or evaluate each locality’s capacity for development.

The empirical part is composed of these: the search or selection of the indicators showing potentials significant to local development, the calculation of indices indicating total development potential and its components in each locality, the evaluation of each local jurisdiction’s development potential on the basis of such indices, the grouping of local jurisdictions based on structure of development potentials, and the exploration of each locality’s relative position within each group given the relationship between development potential and the level of development.

Second, this research likely contributes to various policies of local development. It enables each local jurisdiction to widen the understanding of its specific potential for development in the competition with other localities and to select jurisdictions that can be emulated given the understanding. To put it differently, our work potentially provides each local jurisdiction with basic information needed for each locality’s self-sustaining development that has to be built on its specific capacity or potential.

Despite these implications or significances, this study has some limitations. First, due to the problem of data availability, the indicators of local development potentials
employed in this study fail to encompass a wide range of potentials. Especially, the indicators are confined to quantitative or easily qualifiable components of local development potentials. Thus, they cannot deal with qualitative components (e.g., local culture or institution). To confront this limitation, this research undertakes a comparative case study. Although local festivals are increasingly used as a local development strategy of rural jurisdictions in Korea, the case study deals with qualitative aspects of local potentials related to festivals. Second, since almost all of the indicators reflect the current condition as of 2000, our research cannot deal with dynamic dimension of development capacities or potentials in localities. This weakness is caused by incomplete time-series data. These two limitations reiterate that various data of local development capacities or potentials have to be surveyed periodically and organized in a systemic manner.
Summary
This report consists of policies and institutional applications.

- Analyzing the general information about the peripheral area of Sungnam-Pangyo New Town, include characteristics of landuse, and the potential analysis,
- Establishing targets of growth control plan and landuse directions,
- According to the landuse directions, proposing the landuse guidelines and control tools

The peripheral area of the Sungnam-Pangyo New Town has a high pressure for development, but it exists on the Gyong-bu(from Gyeongi province to Busan Metropolitan Area) growth axis where is overpopulated area. To prevent overpopulation of Gyongbu growth axis and to conserve the nature environment, we establish the landuse directions as to conserve the nature environment rather than development.

By such landuse directions, this report proposals that the Land Development Permission Ordinance of Sungnam city to which the peripheral area of the Sungnam-Pangyo New Town belongs, should be strengthened by introducing the ecological preservation grade, slope and altitude criteria.

Even though the strengthened Land Development Permission Ordinance of Sungnam city, small development can be occurred. For this area we suggest the suitable tools for growth control, such as District Unit Plan or Kukakuseiri.

The establishments of the landuse directions and the proposals about strengthening the Land Development Permission Ordinance, and the suggestions about the suitable tools for growth control, were decided by the continuos agreement with Sungnam city which manages the peripheral area.

Finally, this study will be a precedent model for a similar growth control planning about the peripheral area of the new town project site in the future.
Regional universities have played a crucial role in regional development in the educational, social, cultural, technological and economic sectors. Especially the R&D function of regional universities is one of important sources of regional innovation. But regional universities have faced many difficulties in recent years because of over-concentration of top-class universities on Seoul metropolitan area and insufficient enrollment of the freshmen, high unemployed rate of graduates, inferior conditions for education, and so on.

As a necessary consequence of these conditions, competitiveness of regional universities has been weakened and a gap between Seoul metropolitan area and other regions has been widened. Therefore measures are needed to foster regional universities for balanced national development. This study intends to raise problems of regional universities accumulated in the balanced national development dimension, consider reasons of functional deterioration of regional universities and regional imbalance, and to make some suggestions to solve problems in the field of regional development policy.

This report is organized with eight chapters. Chapter 1 is the introduction. It contains background, necessity, goal, methodologies and ranges of the research with respect to time, space, and contents. In addition, we provide follow chart of research to help understanding of this research.

In the chapter 2, relevant concept and role, effects of regional universities are reviewed from a viewpoint of balanced national development. In addition, the distinction of this research, which is different from previous papers, is presented.
In the chapter 3, spatial location and shift of universities in Korea and behavioristic characteristics of students going to universities are reviewed. To this end, we focus on differences of spatial location between the Seoul metropolitan area and other regions, behavioral characteristics of students going to universities.

In the chapter 4, we analyze the actual condition of regional connection and origin of crisis, effects of regional universities on development of the region. To this end, we analyze the actual condition and problems of regional universities utilizing system model, origin of crisis utilizing result of survey on CEO of regional universities and actual condition.

In the chapter 5, we review domestic and foreign policies to foster regional universities. To this end, we review policies of the Ministry of Education & Human Resource Development and other ministries including the Ministry of Commerce, Industry and Energy, the Ministry of Science & Technology, Ministry of Information and Communication, the Ministry of Construction & Transportation and so on. In addition, we review policies to foster regional universities in Japan, China, Europe, USA and so on, and drew out five policy recommendations.

In the chapter 6, we provide result of a survey on CEO of regional universities and graduates of regional high schools. This result is used for suggesting an alternative policy for fostering regional universities. To this end, we provide result of evaluation on existing policies and alternative policies, incentives for the promotion of regional university, prospect of the development of regional universities and so on.

In the chapter 7, we provide alternative policies for fostering regional universities in a viewpoint of balanced national development. To this end, we provide five basic directions of alternative policies utilizing result of analysis on problems and reason of crisis of regional universities. And we analyzed effects of twenty policy devices in contrast with seventeen main problems of regional universities. Lastly, we suggest six efficient policy devices for fostering regional universities utilizing all results of these analyses.

In the chapter 8, we draw out conclusions of this research and provide next research issues. As we studied above, alternative policies for fostering regional universities are very important to achieve goal of the balanced national development policy.
After studying, we can draw out five basic directions of policy devices for the fostering of regional universities as follows. First, multifarious policies should be implemented for reducing interregional discrepancy. Second, affirmative action for fostering regional universities should be considered. Third, downsizing policy should be considered to strengthen competitiveness of regional university. Fourth, policies to develop the region and regional universities together should be considered. Fifth, efficient and consistent policies for the promotion of regional universities should be implemented.

The measures to foster regional universities for balanced national development under these basic policy directions are as follows. First, preferential policy for regional universities by enactment of a special law should be considered. Second, downsizing policy should be considered to strengthen competitiveness of regional universities. Third, financial resources should be prepared to foster regional universities. Fourth, the establishment of region-oriented universities should be considered for balanced national development. Fifth, it is necessary to develop regional universities in order to attract qualified and competent professors and brilliant students. Sixth, multifarious policies should be implemented to reduce discrepancy between the Seoul metropolitan area and other regions.

II - II
The Namhae-Gun Comprehensive Plan For 2025
2025년 남해군 군기본계획
Dong-jin Shin, Sang-Jo Kim, Hee-Jeong Hwang
November 2004 · 424 pages · Korean

Background and Purpose
Initiating the National Land Planning and Use Law (hereafter NLPUL), urban planning
tools can be applied to county areas just like the urban areas to establish county comprehensive plan for Namhae-Gun, containing an intention of management and utilization for the county administrative areas.

Namhae-Gun is suffering from a crisis caused by decrease in population and economic woes after the end of 1960s. However, the increase of citizens’ interest for leisure and the number of tourists due to the construction of Changseon-Samcheonpo Bridge is giving a new hope for the development of county areas.

Therefore, this operation of NLPUL will be a good model of the county comprehensive plan to present a long term development plan for Namhae-Gun and the establishment of comprehensive plan for all national Guns.

**Summary of the Namhae-Gun Comprehensive Plan**

- **Standard year 2001, target year 2025**
- **Current population 53,039, target population 53,000**
- **Potentiality and issues of developing Namhae-Gun**

There are many touristic resources such as history and nature scenic beauty. By the superior and related plans, Namhea-Gun will present a tourism and resort development area.

The accessibility is getting easier for expansion of traffic-facilities. There are problems of development of the area by the hard control for land use such as inconvenience of living and loss of the will to development. Moreover, concerns about destruction of the scenic beauty of Namhae-Gun including development pressure and decease in population have been brought out.

- **Image of the future and goal of land for Namhae-Gun**
  - Practice in order to be a tourist attraction. To do so, expanding infrastructure for tourism, preservation of nature, harmonized development with environment and its own setting image are inevitable.
  - Strategically encourage the tourism industry and the sports industry and improve environment to develop silver industry, and specialized agricultural and marine
products.
- Preserve and produce on a commercial scale of the historic interest district and promote the cultural activity.
- Make secure from environmental pollution, disaster, and accident and improve the urban district and settlements, and promote the social welfare.

• Land use
- Improve land use according to NLPUL, need about 2.25km² for development to be a land.

• Tourist development plan
- Set and propose to develop district by 5 themes for tour of Namhae-Gun: a place of historic interest district, recreation and sports, maritime leisure, tradition and culture, and Changsreon tour.
- Develop Anggang resort as the center of tourism in Namhae-Gun, and build tour networks to be a competitive tourist.

Korean public enterprises with wide experiences in urban, local and infrastructure developments can help countries and in turn in Northeast Asia promote infrastructure developments they can expand their role in the Northeast Asian region. Korean public enterprises' participation in various development projects in China is meaningful because
it contributes to Korea companies' advance into Chinese markets, boosts the public enterprises' management capacity, and redefines the role of public enterprises. Considering these aspects, this study is intended to examine the validity of public enterprises' entrance to foreign markets in the future, set up a rational cause of action, and prepare effective plans for participation in development projects in the Northeast Asian region such as China.

Part 1, examines why public enterprises should participate in overseas development projects. Chapter 1, explains the necessity, purpose, scope and method of our study.

Chapter 2, examines characteristics of foreign investments and a reality of overseas development projects. By investigating Korean companies' direct investments in foreign countries and public enterprises' engagement in overseas development projects, we derive problems and issues of public enterprises' foreign activities.

Chapter 3, discusses the major characteristics of foreign countries' overseas development projects, and deals major issues through investigating China's Suzhou Industrial Park and Vietnam's Industrial & Export Processing Zones developed by Singapore, water resource development projects jointly by France and China's in Qingdao, overseas telecom projects by the U.S., U.K., Australia and Spain firms, and British Gas(U.K.)'s operations for oil and gas development projects.

Chapter 4 discusses of public enterprises' participation in overseas development projects. In addition the basic direction to promote overseas development projects for public enterprises and necessary evaluation standards.

Part 2 analyzes China's local development projects, and discusses ways for public enterprises to participate in them.

Chapter 5 examines the role of public enterprises based on current status of economic cooperation in Northeast Asia.

Chapter 6 investigates the growth tendency in China and characteristics of spatial developments. By forecasting China's national land development policies and local development in major cities and provinces, we estimate China's regional infrastructure demand and major development plans.
In Chapter 7, an exercise is carried out to predict the demand for investments in local development projects in China. Specifically, we consider two factors: changes in the local development investment environment and demand characteristics of companies with intention to invest in the infrastructure development. Following these steps we estimate the demand for infrastructure development for each region and sector.

Chapter 8 elaborates methods to participate in development projects of Liaoning, Jilin, Heilongjiang and the Bohai Gulf area. For this purpose, an analysis is carried out with regard to the respective areas' local economy, infrastructure status, development plan characteristics and investment factors.

Finally, we purpose a list of potential infrastructure development projects by China's region and sector, in which Korean public enterprises can participate.

As the per capita personal income is increasing and residential buildings in cities are high-rising, resident's concerns on living conditions are increasing as well. Recently, reflecting these trends, related acts and ordinances are keep changing and litigations by residents are also increasing. Permitted development density in residential area has a great influence in people's daily life.

Enacted in Jan. 2003, 「Act on planning and use of national land」 stated that residential development should observe the carrying capacity of infrastructure. But, until
now, scientific method to find out an optimum development capacity is not established. Throughout the continual research, endeavors to prepare a planning guidance on development density are required.

**Introduction**

Development density permitted by acts and ordinances in cities has an influence on citizen's quality of life. There are important factors, such as supplement and maintenance cost of infrastructure, housing type, volume of environmental pollutants, traffic capacity, land price, daylight, privacy, ventilation and noise.

Optimum residential density, substituted by floor areas ratio, can decrease the conflicts among social classes, mitigate the infrastructure deficit or overcapacity and prevent conflicts among land use, In a community level, it can create walkable neighborhoods, support housing choice and affordability, expand transportation choices, support community fiscal health, improve security and protect the environment.

Unfortunately, research to create an optimum residential density has focused on individual factors, such as daylight or outlook. This research has focused on process to choose the optimum residential density and stressed on a collaboration between cities and social classes.

**Chapter 1. Research Outline**

First of all, this study wants to clarify factors influencing on residential development density and establish relative relations among factors. To prepare for a rational criteria on residential environment, literature review and interview on residents and professionals are performed. Secondly, by viewing the scope of reasonable development in simulation, professionals can utilize this study as a reference when they decide on the development density.

Based on previous studies related with development density, The factors influencing residential development density can be divided into three categories. In the midst of them, a level of residential environment was divided into more detailed criteria again and
summarized by previous literature. Intensive research on Japan's case is performed because it is insufficient and quickly changing factor. In addition, this study surveyed preference on residents and professionals to elicit a desirable criteria. Finally, the study performed computer simulation according to target of individual factor elicited by survey and suggested a desirable floor area ratio as a final result.

Chapter 2. Concept of Development Density and Influencing Factors

As an index to indicate development density, various criteria, such as population density, dwelling unit per acre, open space ratio, road ratio and floor area ratio, can be utilized. But floor area ratio is the more adequate method than any other one in calculating infrastructure capacity or building mass and evaluating an impact on living conditions. Debates on optimum development started in Europe of 1920s and trials to find out a maximum development density in korea are keep going.

As a result of previous research, factors influencing development density can be divided into four parts. The first, urban planning factors that are associated with carrying capacity of infrastructure and urban spatial structure; the second, living condition factors that are associated with daylight, environment, landscape and outlook; the third, social factors that are associated with psychological desire, social interchange, residents' preference, and safety; and the fourth, economic factor that is associated with fiscal health.

Chapter 3. Legal Criteria of Development Density in Korea

「Act on planning and use of national land」 stated that residential area should be divided into several categories. Additionally, the act gives the power a local governments to legislate ordinance within the limits of act. In case of seoul city, local government lowers the floor area ratio than other metropolitan areas and other mid or small sized cities have followed the seoul city's case.

Meanwhile, seoul city's standards followed that of japan and multiple housing development case in korea and reflected opinions of residents and professionals. The city
prepared for the incentives based on spatial structure, such as station impact zone and commercial zone, infrastructure, and topography.

**Chapter 4. Factor Choice and Criteria Review Influencing Development Density**

As the factors of influencing development density, living conditions such as daylight, landscape, outlook, social behavior according to the number of layers, ventilation, noise and privacy are mainly reviewed. Also, survey was performed on residents lives in Anyang-city and Suwon-city, Gyeonggi-do and professionals in Seoul Metropolitan Area. Meanwhile, some items, such as definitions, related regulations, other nation's cases, relationships with floor area ratio, and survey results, are examined. On questions on relative importance of influencing factor, two groups showed the different results. Residents responded in order of noise, ventilation, daylight, privacy, convenience in life, outlook and openness, financial profit and easiness in outing. Meanwhile, professionals responded in order of daylight, privacy, noise, convenience in life, outlook and openness, ventilation, easiness in outing and financial profit. The optimum residential criteria by residents and professionals altogether can be summarized like following; 6～15 stories, 2～3 hour daylight, arranging in a row or tower, 1～1.5H separation distance, openness more than 40%, and south or southeast view.

**Conclusion**

This study conducted a computer simulation to see change in the residential development density. Site layouts were done on a row or tower type apartment. A row type is that 15 stories are the subject of investigation and separation distances were divided into 6m and 12m again. A tower type is that 25 stories are the subject of investigation and separation distances were divided into 12m and 24m. Daylight time should provide 2 hour and 3 hour, respectively. The physical mass of Apartment housing is 41m length and 10m depth. The height of each story is 2.8m and separation distance from property line is 6m. Practical simulation is conducted on 6 masses and designed 3 dimensional layout to take advantage of AUTO-CAD program.
Computer programmer investigated the shadowing at 15-minute intervals from 8:00 AM to 4:00 PM on the winter solstice. Throughout these process, researcher classified space into following 3 categories. First, space where unobstructed 2 hour daylight is provided. Second, space where perfect overshadowing is provided. Third, space where unobstructed 2 hour shadowing is provided. The researcher controlled separation distance, identified the influence of daylight and elicited floor area ratio on respective site.

Recently, as the residents' awareness on living environment is improving court admits outlook as an important living condition. Some local governments have tried for a new attempt, such as enactment of a municipal ordinance to minimize the outlook screening. However, except for infrastructure carrying capacity and financial profit, other factors have a limitation to elicit an explicit result that subjective calculation is very difficult and uncalculable psychological factor is an important criteria. The study indicates that residents' collaboration is the most important factor in determining density criteria. Because preferable residential density criteria should be different according to region and social class, local government should make an acceptable residential design criteria throughout residents' cooperation.

Competitiveness of industrial location, in general, has not relied upon the economic competitiveness and technological innovations because of the increased recognition of the
natural environment, the settlement of local autonomy system, and the increased citizen participation. Citizen's growing recognition of natural environment has requested industrial location development to follow the environment-friendly ways in accordance with such critical review on the institutions and habitual practices related to industrial location development.

On the other hand, various sources have criticized the regulatory institutions regarding environmental management for industrial location development, indicating that rigid environmental regulations increased development cost causing the companies to bear more burdens. Considering the significance of the natural environment, however, it is desirable that industrial location development should take the environment into consideration with high value. Hence, to make industrial location development competitive, it is necessary to combine such important factors as region, company, and the environment, ensuring the political alternatives to accommodate various reciprocal perspectives rationally.

This study has intended to provide the policy alternatives of industrial location to make industrial location development in harmony with environmental conservation. This research has analyzed the regulatory systems and performance of environmental management in industrial location development, and has surveyed all the parties involved in direct and indirect ways. Besides, this study has examined the industrial location policies and regulations of foreign countries. Based on the above analyses, this study has proposed the policy alternatives and action programs of environmentally friendly industrial location development.

After examining the current situations of environmental management in industrial location, this study has found out that the regions where industrial parks were located and/or individual firms were agglomerated have shown severe environmental problems. This fact means that traditional industrial location development has imposed negative impacts on the environmental quality of the regions. On the other hand, the analysis of environmental regulations related to industrial location development has indicated that the related regulations have been revealed serious problems in both regulations themselves and the operation systems of them.
Environmentally friendly industrial location development involves various interest parties including developer, companies to locate in industrial parks, individual firms located afar the industrial parks, inhabitants living near the industrial parks and/or individual firms, and management organizations of industrial parks. To make environment-friendly industrial location development effective, it is important to enforce all parties involved to participate in the whole process with openness to accept and adjust various opinions.

For example, with strict environmental management regulations, environmentally friendly industrial location development policies of foreign countries ensure that all parties, especially inhabitants near industrial parks and/or individual firms, participate in policy development and decision-making process, and to take regional situations into consideration. But, even though the environmental management regulations are very rigid, the operation systems are very flexible. And the foreign cases showed that environment-friendly industrial location development required significant cost.

This research suggested several policy alternatives as follows: 1) conversion of policy directions from preserving natural environment to managing the regional environment, where industrial parks and/or individual firms, in a comprehensive manner, 2) integrated environmental management from investigation and planning to management and operation phases, 3) comprehensive industrial environmental management covering not only industrial parks but also individual manufacturing sites, and 4) policy alternatives covering both new development projects and existing industrial parks. Based on the above policy alternatives, this study suggested several strategies and action programs.

Finally, this study recommended the following policy directions for the environment-friendly industrial location development: 1) all parties involved should be considered; 2) industrial location development must be harmonized with the regional situations, especially regional economy and environment; 3) government should play a positive and rational role; and 4) special concern should be focused on the individual manufacturing sites, the core of the environmental problems in industrial location.
Since the late 1990s, the national support for industrial parks has diversified due to deteriorated competitiveness of domestic industries and relocation of domestic companies abroad. Despite continuously increased supports for industrial park developments, however, Korea's industrial park support system is currently facing various criticism. The government needs to examine and promote steady expansion of national supports for industrial parks, and simultaneously prepare specific and objective standards to efficiently and effectively utilize the national supports. Once the organized support system is set up and objective and specific support standards are prepared, the government should be able to provide actually useful supports through the same scope of support. This is attributable to an improvement in the national competitiveness of overall industries.

This research is intended to analyze problems of Korea's support system for infrastructure facilities and to propose respective improvement plans as one of the policy tool. Particularly, we aim to secure competitiveness of industrial parks and strengthen competitiveness of companies coming into the industrial parks by establishing useful and logical basic facility support standards based on our analysis of the basic facility system's current status, supports and problems.

In this research, we did: 1) analyze the support system for industrial park basic facilities in Korea; 2) derive actual national supports and systematic or operational problems and improvements through investigating national support cases about the actual industrial park development and surveying companies located within industrial parks about the location environment; and 3) propose logical support standards to strengthen
competitiveness of industrial parks and companies based on the results of our analysis.

Nevertheless, we excluded problems of the support system for individual companies in the industrial parks - which is the weakest out of the industrial park support systems in Korea - in our research scope, and did not deal with the fundamental problems of the current systems (for instance: accumulation of industrial sites to timely supply the land based on the companies' location demand, and development of industrial parks). Therefore, proposals of this research are the short/mid-term treatment, and subsequent research efforts are imperative to provide long-term and fundamental solutions to improve the systems in the future.

Summarizing our policy suggestions to enhance Korea's industrial park support systems, we need to first of all recognize that industrial parks are the major infrastructure of our country. Secondly, the government should promote the industrial park development projects to strengthen competitiveness of the national industries. Thirdly, the industrial location system should be reorganized and promoted over the mid/long term to build innovative industrial park support systems. Fourthly, the government should support basic facilities until it can secure relative competitiveness. Lastly, the government should promote active supports in industrial parks and provision of respective financial supports.
it is alleging problems like deepening in dependance of employment on big cities caused by lack of economic self-sufficiency, serious traffic problems and expenses in excessive infra facilities, and etc.

Self-sufficiency means to make most of the citizen's various activities in its own city, not in external cities.

The self-sufficiency of a new city depends on the population of the developed city and bigger the population it gets, the self-sufficiency and growth potentiality will increase. Considering the citizen's life quality level and each kind of service population inside the city, population of 200 to 300 thousand is being estimated as an appropriate scale of a new city. A simple idea definition for self-sufficient city is a city with 1.0 of job-housing ratio. There are no new cities with 1.0 of job-housing ratio in other countries. (England 0.6 ~ 0.7, France 0.3 ~ 0.4, Japan 0.1 ~ 0.4)

For strengthening the self-sufficiency of residential estate development region are as followed.

First, it needs to extend the idea of self-sufficient facility site. Including the circulate industry in accordance of article 2 of the Circulate Industry Development Law and self-sufficient facility site of article 2 of Public Residential Estates Law, large shopping mall, outlet, and others must be induced to create the employment in the residential estate development region.

Second, it needs to increase the type of urban industries and the enterprise scale. According to the residential estate development business management regulation the industry types that can move in is limited into urban industries for firms, direct facilities of venture business, software business facilities, so it is difficult to induce the large companies.

Third, construction of apartment type factory must be activated. Under the circumstances of the current system, the apartment type factory is the only form to move into the residential estate development region, but the examples managed in the residential estate development region are limited in circumstances for the construction with the purpose of strengthening a deliberated self-sufficiency. To strengthen the self-sufficiency
of the residential estate development region it needs to activate the construction of apartment type factory.

Fourth, it needs to newly establish the secure prescription for self-sufficient facility sites. The self-sufficient facility site of the current residential estate development business management regulation, includes on the public facility site which the secure prescription of self-sufficient site is in vague situation. Therefore public facility site and self-sufficient site should be divided and add the plan for the self-sufficient, and needs to add the self-sufficient site secure prescription. In this self-sufficient site, it needs to include the commercial business site. The commercial business site also creates employment just like the apartment type factory. Also in the aspect of strengthening the self-sufficiency of residential estate development region, huge residential estate with an area of over 3,300,000m², has to clarify that it must prepare a 6.15% of self-sufficient site in its own site.

Fifth, connecting the residence supply and commercial business function must be considered by governments.

Sixth, connecting the residential estate supply planning and preparation of urban high-tech industry complex must be considered. For this plan it can be considered by residential estate development project implementation plan agenda method, duplicating residential development region and urban high-tech industry complex and designating method, and excluding self-sufficient facility site from the residential development region and designating separate urban high-tech industry complex plan.
The 1st objective to be sought for is, to research and analyze the metropolitan area housing conditions including both the new town and old, life-satisfaction, requirements of additional new town development. Moreover, the 2nd objective aims for this study to be applied as the fundamental data of future new town development rules, suggesting better guidelines and policy establishment.

The questionnaire was processed after being divided into 4 items and the major survey contents are as the following. The first survey item covers the current pattern of housing and occupation related aspects of those questioned such as former living address, reason of moving to current address, type of housing, state of ownership, size of house, job location, way of transportation and time.

The second item is about comprehensive satisfaction index linked to facility and service quality that can be described as standards of public institutions, convenience centers, medical, welfare, education, culture, leisure service and community network. Parks, forest lands, transportation, environment, security, economic activities and employment opportunities that are connected to patterns of housing were also included in this item list for survey.

The third item focuses on the reason of moving to a new address. The main points contain future plans to move, reason of moving, preferred area for living or residence, form of ownership, size of house and etc.

Lastly, a systematic research was executed by streamlining new town development premises like required standards examination and outlook overviews. Favorable new town
locations considering transportation access, intention and reason moving to new town, functions that a new town needs were covered in the former as a required standards examination and new town development awareness, new town supply method, outlook or expectation of housing cost and etc in the latter as outlook overviews.

This study started from the recognition that social conflict was inevitable in the process of public policy-making related to spatial plans and the conflict had an influence on various components of a relevant society. This study aims at analyzing the regional impact of locational conflicts related to public facilities and providing an empirical basis to make recommendations for minimizing the negative impact of locational conflicts. Case studies were conducted to analyze the social impact in the regions concerned with specific locational conflicts.

To achieve these objectives, chapter 2 reviews the conventional theories on social conflicts and derives 10 hypothesis in relation to the impacts according to the typology of the conflicts. It also examined key factors behind the locational conflicts in reference to public facilities and suggested the framework for assessing the effects of the factors.

Chapter 3 examined the three cases of locational conflicts in Korea on the basis of theoretical review in chapter 2. Two conflict cases among NIMBY facility conflicts and one case in PIMFY facility conflicts were selected for empirical analysis. In order to
gather more information concerning the conflicts, in-depth surveys were conducted along with a literature and data investigations, questionnaires and interviews. Using these surveys as a basis, the conflict impacts were assessed according to the framework established in chapter 2. The impacts were classified into social, economic, institutional and executive categories in regional terms.

Chapter 4 verified ten hypotheses derived in chapter 2 through a comparison with the result of three case studies conducted in chapter 3. It was verified that all hypotheses except one agree with the facts shown in the case studies. Hypothesis 4, “The more number of issues, the more serious the conflicts are”, could not be generalized from the case studies. Policy implications from the impact analysis are as follows.

- The establishment of a collaborative partnership to justly provide information and the establishment of a system to alleviate mutual distrust in the process of policy making concerned with spatial plans are necessary.
- A policy maker needs to grasp stakeholders interests and to consider their circumstances before going ahead with a policy change.
- In order to manage and prevent conflicts, it is necessary to select potential sites for the location of public facilities through thorough investigation and to preserve the consistency of policy once it is decided upon. And it is also important for a policy maker to concentrate his/her efforts on making stakeholders understand that the chosen policy is the best under the existing conditions.
- The main factors influencing public conflicts are the government's concern about local resident's interests, the possibility of outside intervention(third party), regional characteristics and environmental matters, rather than the question of economic efficiency, the technical suitability and geographic conditions related to the conflicts.
- The degree and effect of conflict between government and local residents depends on the government's ability to mobilize local residents, and the consolidation of local residents and social organizations. Usually the participation of environmental and social groups can give rise to the expansion of conflict.
- Because the location of hazardous facilities such as nuclear waste disposal units is
liable to cause a collision and counteraction of sentiment among stakeholders, a balance of cost and benefit is very important for conflict resolution.

- Conflict resolved through political means can allow a return of a conflict if the political environment changes.
- Regardless of the nature of a conflict situation and the other party's behaviour, parties in most conflicts tend to adopt negative strategies and methods such as compulsory and violent behaviour, supremacy over the other party, indifference toward and disregard for the wishes of the other side.
- Conflict resolution that is achieved through all parties' participation and negotiation can easily allow an agreement to be put into practice and maintain its' solidity.
- The character of a conflict issue may have more influence on the progress of the conflict than the reach and complexity of the conflict, and conflicts concerned with value systems can develop into serious situation which include violent behaviour.

In the concluding chapter, the major findings were reviewed. The main factors of public disputes are the interests of the stakeholders, and the inequality of the externality in relation to the location of public facilities. The combination of these factors determined the degree of conflicts. The more serious conflicts have a more aggravated influence on communities both during the process of conflicts, and after the resolution of conflicts.

The impacts of locational conflicts in the regions are mainly negative. Therefore, conflict management is as important as the resolution of conflicts, especially in locational conflicts. In the case studies, we could verify that social impacts of locational conflicts have a negative effect in the community, and that minimization of the social cost of the conflicts is the foremost requirement.

Limitations in this study lie in the difficulty of assessing the various impacts in relation to identical criteria, especially assessing the externality of facilities. These limitations can be overcome to some degree by analyzing and comparing a number of empirical cases.

More additional studies should be conducted to guarantee the objectivity and accuracy
of the tools used for analyzing the regional impacts of locational conflicts. Further research is necessary to design a conflict impact assessment prior to conflicts, and a conflict management system after conflicts occur.

In Korea, since the middle of the 90s, the establishment of technological innovation center(TIC) has been one of the most popular instruments for local and regional technology policy. Following the founding of Yonsei University TIC and Koryo University TIC in 1995, around 46 universities(39 technological innovation centers) have established TIC facilities under the support of the Government. Despite the multitude of technological innovation centers, very comprehensive evaluations of such institutions have not been undertaken.

This paper essentially pursues two goals. First, the most important survey results of 39 technological innovation centers in 46 universities, 327 of 2,214 enterprises currently are presented. Second, the policy directions of technological innovation center project are discussed. Due to the capacity and size of the centers, most centers did not reach their main goals, namely economic independence.

The study is organized as follows. Chapter 2 identifies a definitive framework and an evaluation model to analyze the TIC project. In the TIC evaluation, we use the system
variables such as resource, input, structure and process, output and impact.

Chapter 3 covers from an analysis of resource and input to an analysis of output and impact. Resource variables characterize the origins of a number of inputs into a system such as regional industrial structure or industrial specialization. Input variables describe various inputs from the environment to the system such as funding, infrastructure, manpower and support capacity of regional government. The structure and process of TIC focus on the linkages and knowledge flows such as university-industry links, inter-firm links and networks.

Chapter 4 analyses the response of firms related to TICs. The data is used for a survey for firms related to TICs. The survey data was collected by mail or e-mail from May 2004 to July 2004. Technological innovation centers have to operate more actively and with a demand orientation, in order to satisfy the real needs of firms.

Chapter 5 provides us an overview of the analytical results and brief case studies related to TICs of Japan.

Chapter 6 reviews an overview of the policy implications and the role of TICs. The study ends with some concluding remarks.

The ICT (Information and Communication Technology) industry has played a crucial role in national and regional economic growth in the information age. In order to
strengthen the competitiveness of the ICT industry, there needs to analyze the ICT industry clusters, other related industries and supporting functions. This study aims at researching strategies on interregional function sharing of ICT industry in Korea.

This report is organized with seven chapters. Chapter 1 is the introduction section. It contains background, necessity, goals, methodologies and ranges of the research with respect to time, space, and contents. Chapter 2 reviews relevant theories and characteristics of the ICT industry. The ICT industry is the core industry consisting of regional economy. Compared with other industries, the ICT industry has the highest R&D investment rate. Due to complexity of the ICT industry having a wide variety of meaning, range and classification system, the new different framework needs to be established to differentiate this study from other researches. The theories having strong connection with the growth of the ICT industry, such as Kondratiev's wave theory, the New Economy theory and cluster theory, are mainly examined by various means. The formation of ICT industry clusters does not only require both supply and demand benefit, but also has the possibility that each cluster can be developed in different ways according to specific industry of the region.

Chapter 3 deals with development of the ICT industry. In addition, the location policies and many cases of the ICT industry are presented by comparing domestic and foreign cases. The ICT industry has been incrementally diffused from U.S.A. to Asia or Europe. This phenomenon is based on locational changes of multinational corporations affected by mass production and standardization. The ICT industry clusters can be divided into two types: policy-type and market-type. India and China are good examples of Asia. In Europe, ICT clusters are simultaneously impacted by central and local location policies. Ireland, Northern Europe, Finland and the Netherlands made different cluster models. This chapter concentrated on comparing ICT industry policies and growth models of some foreign countries having ICT industry clusters with Korea. This analytic approach helps to illuminate the limits of the Korean ICT industry policies. Generally market-type cluster is dominant in the Seoul metropolitan area, while policy-type cluster is dominant in local areas.
The present condition and agglomeration of the Korean ICT industry are reviewed in Chapter 4. Production, employment, R&D, importation and exportation, forward and backward linkage effect and clustering are all considered. After the position of the Korean ICT industry identified, the criteria for ICT industry clusters are selected. The ICT industry has strong forward and backward linkage with almost all other industries. The formation of ICT industry clusters is showed as a map by using Arcview. Seoul, Gyeonggi, Chungnam(Cheonan, Asan), Cheongju, Daejeon, Gwangju, Gumi, Daegu, Changwon and Busan are representative of ICT industry clusters. ICT industry clusters are classified into four categories according to the agglomeration degree of the ICT industry: the position of cities(ICT industrial cities, ICT industry candidate cities, ICT industry potential cities), the presence of a core city within local areas, the distribution of supporting institutes, and a government policy toward fostering the ICT industry. The cities which have more than two of the four conditions are named as ICT industry cities, and ICT industry cities are classified into four categories by growth stage and industry type: service industry-growing stage type(Seoul), manufacturing industry-growing stage type(Suwon, Gumi), service industry-formative stage type(Daejeon), manufacturing industry- formative type(Cheongju, Cheonan, Gwangju).

Chapter 5 covers empirical studies. For evaluating the existing clusters and searching for new policy alternatives, empirical studies are carried out by both surveys and in-depth interviews. This chapter is focused on researching ICT industry cities, which were classified in the former chapter 4, and analyzing interregional function of each city to present policy alternatives to strengthen ICT industry competitiveness. The growth, location, agglomeration and function of ICT industry cities are investigated respectively. Based on the condition and degree of ICT industry agglomeration, elements and linkage of each ICT industry cluster are analyzed at a regional and interregional level.

A SWOT analysis is conducted in order to establish strategies on interregional function sharing of ICT industry clusters. Major findings are as follows. The Seoul ICT industry cluster is a ‘service industry-growing stage’ cluster. It has the advantage as Korea's Capital, where management and financing are comparatively good. Second, the Daejeon
ICT industry cluster is a ‘service industry-formative stage’ cluster. Although its linkage with information is strong, the linkage with market is weak. Third, the Suwon ICT industry cluster is a ‘manufacuring industry-growing stage’ cluster. Based on digital media, the Suwon ICT industry cluster has close relationship with other firms.

At a domestic level, the Suwon ICT industry cluster maintains high linkage with proximate regions such as Cheonan, Asan and Gumi, on the other hand, at a global level, Suwon shares information and service with other global clusters. The Cheonan ICT industry cluster is a ‘manufacturing industry-formative stage’ cluster. Despite benefits from the location of Samsung Electronics Co., the domestic position is not competitive. R&D activities have not been joined with supply chain. Core parts and materials depend on global outsourcing.

The growth of the Gumi ICT industry cluster is mainly caused by an industrial park and large electronics companies. In recent years, the Gumi ICT industry cluster has a strong point in mobile and display, but R&D activity is weak. The Cheongju ICT industry cluster is a ‘manufacturing industry-formative’ cluster. The growth of the Cheongju ICT industry cluster is based on manufacturing factories, and as a result, its supply basis is not strong. The Gwangju ICT industry cluster is a ‘manufacturing industry-formative type.’ The Gwangju ICT industry cluster is strong in the area of opto-electronic industry.

Chapter 6 suggests the means for function sharing of the ICT industry. For better directions of function sharing, it is necessary to apply ICT industry clusters to a global service city model, capital growth model, function specification model, and FDI growth model. The new standards used for classification are mono-function type, multi-function type, plan type and natural appearance type. The means for function sharing of ICT industry clusters are based on four directions: industry type, size of clusters, growth stage, critical mass.

The means for function sharing are as follows; For the Seoul ICT industry cluster to grow as a global ICT cluster, it is required to link with global cities and global ICT clusters like Silicon Valley. At a national level, it should cooperate with the Daejeon ICT industry cluster which has a strong point in terms of R&D activity. Second, the
Suwon-Cheonan ICT industry clusters should grow as global clusters in the sector of semiconductor and display. Although its function is overlapping with the Gumi ICT industry cluster, competition in good faith deserves establishing. Third, the Daejeon ICT industry cluster having market and critical mass should make efforts to attract multinational corporations.

To overcome internal weakness, it is essential to link with the Seoul ICT industry cluster in terms of venture capital, legal service, consulting, etc.. Fourth, the Gumi ICT industry cluster should attract large sized firms including multinational corporations. The size of the cluster needs to be expanded to Gimcheon, Chilgok, and Daegu to compensate for the disadvantage of small town. The Cheongju, Gwanju ICT industry clusters should reinforce R&D activity by constructing cooperative environment between large companies and subcontractors. Because the Cheonan, Cheongju and Gwanju ICT industry clusters are all based on local areas, government should support these clusters.

For the Gangnam Teheran Valley and Suwon ICT industry cluster to strengthen competitiveness as leading clusters, location support and deregulation policies are essential. In case of Daeduk, multinational corporations should embed in the area and support SMEs. The Cheonan-Asan, Gumi-Daegu, Gwangju and Cheongju ICT industry clusters cooperate with foreign R&D institutes, universities as well as domestic universities. In addition, infrastructures for innovation are required to provide sound living conditions to high-paid labour forces.

Chapter 7 has conclusions and next research issues. To strengthen national competitiveness of ICT cluster, it is indispensable to construct ICT industry clusters according to specific characteristics of each region. By joining interregional distinct characteristics, interregional function sharing of the ICT industry can be reached in the direction of maximizing synergy effect. In this study, the strategies for selection and concentration are discussed. The function sharing between ICT industry clusters is able to guide symbiotic developments. Especially, new areas in the middle of planning should attract multinational corporations, universities and R&D institutes.

Next research issues are as follows. First, the next research project considers more
specific factors about ICT industry clusters investigated in this research. Second, the interregional function sharing of the BT(Bio Technology) industry, which most local governments long for as a strategic industry, needs to be studied. Third, critical mass, optimal size, function sharing of R&D, deregulation and financial support policies of the government are necessary to build ICT industry clusters and competitive RIS.

The purpose of this study is to establish a typical case study of new urban construction by minimizing environment destruction in the process of the New Capital construction. In order to achieve this, new ideas are elicited from specialists to produce pleasant habitation space and sustainable environmental policies which are also made preliminary in establishing urban spatial environmental plans.

This study is processed by public subscription divided into designated task and free task to induce specialist’s brisk participation:

- Public subscription is noticed on newspaper and homepage;
- Evaluation on subject of proposals is chosen to judge a committee for selection on subject of research;

Moreover, an advisory committee and forum are held to enhance the quality and to present the direction of the story;
- Inquiry commission management held a conference and workshop.
The theme of study composes of urban environment and residence space, housing planning and architecture, transportation and information system. The final report will be utilized as both a guideline of plan establishment in the field of urban creation and construction and a basic data of system development and policy alternatives.

Background and Purpose
In order to construct a model city worldwide, it is very important to gather fresh design ideas and urban concepts from planners and designers in practice across the world with diverse cultural backgrounds. So, the competition was to secure fundamental urban design ideas through holding an international competition. The current study, therefore, aims to prepare and execute an international competition for quality of urban design works, and facilitate them to be utilized as planning and design guidelines for urban development plans following afterwards.

Summary of Contents
First, diversified domestic and foreign examples of design competitions are gathered and analyzed for references.
As examples of foreign countries, international competition of Canberra in Australia and domestic competition of Brazilia in Brazil are chosen. And such details of these as
backgrounds and summary, sponsored organization and length of competition period, design guideline, submission style of final works, evaluation standards, organization and length of evaluation period are widely analyzed. As domestic examples, National Museum of Korea, Nam-Ak New Town, Song-Do New Town, Design Competition for Nam-Ak 3rd Section of Works, Baek-Nam-Jun Art Gallery, etc. are chosen for case studies.

For a smooth process of the project, a task force comprising many experts from related fields is formed, and the TF discusses and comes up with outlines of basic preparations for the competition such as announcement methods and period, participant's requirements, the choice of professional advisor, the choice of works evaluation committee members and the way of its maintenance, works evaluation and prize-winning works choice methods, way of awarding prizes for chosen works, required preparations- before, during and after the actual competition.

Among the preparations before the competition, having grips of target organizations for competition advertisement, advertisement methods, and drawing-up of competition guidelines are included. And, among the preparations for the actual process of competition and awarding, competition period, holding on-site briefing tour, methods of Q&A, guideline for choosing evaluation committee members, submission style of final works, way of awarding prizes for chosen works are covered. In addition, ways of how to link the contents of the chosen works to urban master planning afterwards, and after-competition procedures such as the making of final works collection and exhibition events are included.
Background and Purpose

The Seok-Moon National Industry Complex is recognized an old fashioned industry complex, since it had been established 10 years ago, thus, the facility is very limited to meet the rapid changing pattern of industry.

The purpose of this research is to establish a master plan and action plans to make Seok-Moon, a forward-looking complex by analyzing future industry environment and the changes and patterns of corporate demands and planning marketing strategies.

Summary

This report largely composes of 4 chapters in total; development environment analysis, industry type selection, master development plan and action plans.

In the first chapter, Development environment analysis related to laws and plans reviewing with current situation analyzing, we present some constraints and development potential by SWOT analysis.

In the next chapter, Industry type selection, we overview the new development concept and selected industry types and then present demand forecast for planned sites through the survey of specialists, a corporate demand survey and the study of foreign cases.

In the third chapter, Master development plan, we present its site design to maximize productivity, amenity and efficiency, targeting “Seok-Moon echo-multitechno park” which combined three such concepts of “Qualified future industry complex”, “Hybrid industry complex with vitality”, and “Industry complex closely linked to region”.

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In the last chapter, Action plan, marketing and detailed action plans are suggested to well proceed with development plan and secure competitive power of location.

This research is meaningful in two aspects. First, this research contributes to create pleasant environment to induce domestic and foreign people of talent by introducing cluster concept and multi complex with university and golf course to national industry complex.

Second, it suggests total solutions(or strategies) such as supporting policies, cost saving ideas, marketing methods from development plan to marketing plan for a national industry complex.

The conventional wisdom of policy-makers and regional planners is that small-medium-sized cities play an essential role as regional service centers in rural hinterland development. The revitalization of the small-medium-sized cities production and institutional structure not only contributes directly to rural and regional development, but is even seen as a necessary condition. In this study the definition of the small-medium-sized cities is prescribed as the city with population between 50,000 and 300,000 persons. In addition, those of the capital region and Jeju island are excluded. There are 36 small-medium-sized cities accommodating 6.9 million persons in the year of 2000.

The purposes of this study are as follows: 1) to make a contribution to the balanced
national territory development through self-supporting localization; 2) to explore various alternatives for strengthening the function of small-medium-sized cities; 3) to propose policy alternatives for the role of small-medium-sized cities in nodal point functions between large cities and rural vicinity areas.

For solving the shown above purposes firstly, this study tries to analyze changing processes and actual conditions in the national settlements system. Secondly, it examines the definition, functions and roles of the small-medium-sized cities. Thirdly, it investigates the characteristics of the classified small-medium-sized cities through the analysis both of growth factors and of regional disparities. Fourthly, it examines various case studies of overseas policies and draws implications for Korean cases. Finally, through the questionnaire survey it proposes revitalization strategies composed of strengthening the internal competitiveness strategy and constructing the cooperative systems between urban and rural regions.

From 1990 to 2000, the shift of population changes in small-medium-sized cities shows slight increase compared to rapidly decreasing rural regions. The population share of small-medium-sized cities has increased from 14.5 percents in 1990 to 15.0 percents in 2000. However, some cities are increased, others are decreased in accordance with both the distance from the Capital Region and the impact of regional metropolitan cities. The age index of small-medium-sized cities, which represents the ratio of population older than 65, shows 10.4 percents rather than 7.3 percents in national total. Also, percent of population with college degree shows 6.7 in small-medium-sized cities. Among 7 provinces Gangwon-Do shows 8.4 percents, while Chungcheongnam-Do does 5.5 percents.

The questionnaire survey on general public and specified professional group was carried out. Four groups are targeted. As a general public group, 100 enterprisers in small-medium-sized cities are participated. Specified professional group is composed of 75 professors, 55 researchers, and 180 government officials in small-medium-sized cities. Structured questionnaire which consists of 16 questions is utilized through telephone, e-mail, and fax system for the total 410 individuals. Some implications from this survey
for the revitalization strategy of local small-medium-sized cities are such as tax support for inviting the establishment of industries, cooperation between local universities and private industries, and participation of private enterprises for local development.

In order to learn from successful stories from advanced countries, various kinds of case studies for the revitalization of small-medium-sized cities of Japan, the United Kingdom, and the US governments are adopted. Small town development programs of Japan through the 3rd, 4th, 5th Japanese national territorial development plan provide useful lessons for us. The enterprise zones program of the U.K. furnishes a lot of fruitful implications such as tax reduction policy, relaxation of restriction, and prompt action of administrative procedures. The empowerment zones program of the U.S. also offers various kinds of informations such as population size and spatial scope of the zones, revitalization policy for the declined area, and social, economical side-effects. The common implication of three countries emphasizes on the local government initiatives and leadership.

In the conclusion part, this study proposes two kinds of revitalization strategies for local small-medium-sized cities. The one is the strategy of strengthening for internal competitive capability. The other is the one of construction for inter-city network system. The first one is composed of four detailed strategies; 1) the revitalization of regional domestic economy, 2) the revitalization of culture and tourism activity, 3) the revitalization of cooperation between public and private sector, 4) the revitalization of regional community potentials. The second one consists of three detailed strategies; 1) the region-wide linkage between urban towns and rural communities, 2) the functional distinction and linkage in inter-city network, 3) the promotion of competitiveness system among towns and communities.
Background and Purpose

This project prepared to realize the development plan on metropolitan regions that is suggested in the fourth national territorial comprehensive plan (2000-2020). The plan designated 10 metropolitan regions to form the basic direction for opened national territorial development and foster growth centers for the balanced regional development in the age of globalization and localization. In addition to Gunsan-Janghang metropolitan region, this project extended the spatial scope into Jeonju city and its surrounding region where the functional linkage is high and has continued its role as a regional center. The project suggested the spatial scope and development direction on additional region.

Summary

The plan consists of 5 parts, including the outline of project, review and choice on alternatives, basic concepts for development plan, sectional plan and implementation and management of plan.

The part of project's outline mainly deals with backgrounds and purposes of plan, spatial scope and methodology.

In order to formulate the additional spatial scope, the project deals with planning direction, criteria, analysis on alternatives and comparison, and suggestion of optimum spatial scope. Firstly, three alternatives are elicited using various criteria and indicators, such as regional centrality and functional linkage, then preliminary environmental impact evaluation are performed on each alternative. Based on the development principles,
functional allotment of the metropolitan region, negotiation with related organizations, and consensus building, Jeonju-city, Wanju-gun, Buan-gun and Jeongup-city are designated as additional regions.

Basic concept section for development deals with existing regional conditions, SWOT (Strength, Weakness, Opportunity and Threat) analysis, changing process and future's prospect on the additional regions. The development goal was determined as “strengthen the central and supporting function required for the formation of an international production and trade region.” As a strategy to perform this goal, 4 objects are determined. First, building up a business and supporting service to attract the international business function; Second, constructing of a new industrial complex to foster film industry, culture, and biotechnology; Third, performing roles as a center for international traditional culture and tourism; Finally, forming an international trade and business center, based on urban network theory. The project aims to strengthen the functional linkage between existing region and additional region, elicit synergy effect by comprehensive development, and foster international production and business center by reinforcing the regional mutual supplement. Spatial program is prepared and main indicators including target population and GRDP are forecasted.

Sectional plan deals with reorganization of human settlement system, urban development and urban rehabilitation, industrial location, regional utility facility, metropolitan transportation system, logistics and tourism, environmental preservation, and development of human resources. On each section, development direction, strategy and programs are suggested.

Finally, in the section of implementation and management, the primary programs are suggested to foster as a center of international production and trade. To strengthen the execution, investment and funding plan as well as implementation and management plans are also suggested.
Obsolete Urban Planning System despite Changes in Social Structure

For the past approximately 40 years since the Urban Planning Law was enacted in 1962, the social structure has substantially changed to respect each individual's freedom and equal rights from putting the national benefits first. However, the urban planning system has shown various problems without achieving developments equivalent to changes in the social structure.

Therefore, it is imperative to endeavor to solve problems so that the structure of a society that determines the urban comprehensive plan and urban management plan, namely, the basic structure to decide upon urban plans can correspond to the social development. It is also important to make efforts to utilize the urban planning system as a necessary and valuable system for our society.

Consequently, it is meaningful to diagnose and clarify the problems in the urban planning decision structure under the current urban planning system in accordance with John Rawls' A Theory of Justice, and to search for a desirable structure to produce corresponding urban plans. In addition, tasks to exercise must be proposed to suggest a direction of development and improve the system through theoretical and positive research. During this process, it is also significant to find a plan to widely educate the general public and form the national consensus on the necessity to improve the system by emphasizing the structural problems in decision-making of urban plans.

Urban Planning Decision-Making Structure based on Social Justice

Similarly to the basic structure of a society, the basic structure of urban planning
Rawls' A Theory of Justice provides theoretical clues to the principles of the basic social structure. Rawls argues that the basic social structure needs 3 major principles: 1) the impartial liberty principle; 2) the fair equal opportunity principle; and 3) the difference principle, which are mentioned in order of priority. Comparing the basic structure of our society with the decision-making structure of the urban planning, we searched for the applicability of these principles. On the premise that Rawls' original position and veil of

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**Table 1> Principles of Urban Planning Decision-Making Structure**

<table>
<thead>
<tr>
<th>Rawls' Principles of Justice</th>
<th>Principles of Urban Planning Decision-Making Structure</th>
<th>Framework of Problem Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liberty Principle</td>
<td>Through the urban comprehensive plan, each individual must have the equal right to the broadest overall system of impartial liberty to promote the quality of life compatible with the freedom of everybody else to promote the similar quality of life. However, the freedom to utilize land under the urban management plan may be restricted if there are concerns over lost freedom caused by everybody's liberal utilization.</td>
<td>Organization &amp; Connection of Urban Planning</td>
</tr>
<tr>
<td>Equal Opportunity Principle</td>
<td>Inequality contributed by the decision-making structure of the urban comprehensive plan and urban management plan assumes that all general citizens and parties interested are associated with one another as a qualified participant under the conditions such as the fair equal opportunity principle.</td>
<td>Maintenance of Openness &amp; Fairness during Planning Process Balance of Effects from Urban Planning Decision-Making</td>
</tr>
<tr>
<td>Difference Principle</td>
<td>Inequality contributed by the decision-making structure of the urban comprehensive plan and urban management plan must consider the next generations by standing compatible with the sustainable urban structure on the premise that the decision-making structure of the urban management plan does not damage the balance within the community.</td>
<td>Maintenance of Openness &amp; Fairness during Planning Process Balance of Effects from Urban Planning Decision-Making</td>
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</table>
ignorance are implemented, the parties participating in establishing the principles need to maintain innocence not to figure out their own advantages and disadvantages, assuming that the urban planning decision-making structure is not confirmed yet.

Accordingly, it is necessary to divide the role of the urban planning system into the urban comprehensive plan and urban management plan, and compare them with Rawls' principles of justice. The following table summarizes the principles of the urban planning decision-making structure corresponding to each of Rawls' principles.

**Analysis of Problems in Korea's Urban Planning Decision-Making Structure**

According to the hypothesized principles of the urban planning decision-making structure established on the basis of Rawls' *A Theory of Justice*, we diagnosed the current urban planning decision-making structure in Korea, and analyzed the problems. Our analysis focused on: 1) organization of the urban planning system and connection between the plans, which are established from the standpoint of the principles of the urban planning decision-making structure; 2) maintenance of balance in splitting benefits from the urban planning decision effects; and 3) upkeep of openness and fairness during the planning process.

First, regarding the organization of the urban planning system and connection between the plans, since Korea's urban planning system has the unilateral top-to-bottom structure of “Urban Comprehensive Plan → Urban Management Plan → Urban Development Project,” a partial modification of the low-ranking plan unavoidably leads to a modification of the top-ranking plan, which contracts operation of the whole plan and lowers effectiveness. In addition, the urban comprehensive plan is operating merely as a blueprint and has fallen as a tool to rationalize the urban management plan in advance, failing to play the true role to propose the vision of a city. The urban management plans such as the target region & district system and district unit plan also post insufficient aspects as a land utilization & management means. Through deciding upon the urban management plans, the urban comprehensive plans are rationalizing occurrence of contingent profits before developing activities take place, and the unfair results are
causing conflicts among the residents.

Second, looking at the reality of the procedure to determine urban plans in terms of the balanced allocation of benefits from the urban planning decision effects, we see that the price of land targeted for the urban management plans rises due to changes in the target regions or district unit plans, and contingent profits stem from the preliminary notice or announcement of the government's various development plans. This phenomenon is amply reflected on the examples of the preliminary development plan notice, changed target regions, established basic urban plans and district unit plan setups in our research. Occurrence of contingent profits arising from the documented plans without any specific developing activities drastically boosts land prices, the people's economic burden and land acquisition expenses, ultimately leading to setbacks in desirable execution of the development project and other negative results.

Third, with respect to upkeep of openness and fairness during the planning process, the government is operating diverse systems to boost openness and fairness of the planning process by holding public hearings & public displays, listening to opinions from local committees, consulting with the Urban Planning Committee, and collecting proposals from the residents to the draft of the urban management plans. Nonetheless, many problems are exposed in the actual operation cases related to the operation of the resident's direct participation system(public hearings and public displays) and opinion proposal associations(such as the local committees, Urban Planning Committee and Urban Planning Standing Committee), and unprofessional administration of the urban planning, calling for an immediate improvement. In the meantime, unless the government fundamentally changes the current land system and urban planning decision-making process which encourage the general citizens to look at real estate properties as a speculative investment and to focus on the personal property rights, it will be difficult to lead the present resident's participation system to a correct direction.

**Plans to Establish Urban Planning Decision-Making Structure**

Based on the problems in Korea's urban planning decision-making structure, we
established the following plans to establish the urban planning decision-making structure in accordance with the aforementioned theory of justice.

First, the basic urban planning system must be able to recover the original function and heighten functions of the urban management plan as the land utilization & management means in order to organize the urban planning system and connect the plans. Accordingly, the paradigm of the urban planning system must change from the unilateral top-to-bottom system to the triangle that mutually connects these 3 elements on equal terms. By newly setting up a baseline at the center of the new paradigm, the government must minimize occurrence of contingent profits, and guarantee the deliberate development.

Furthermore, the urban comprehensive plan must make efforts to set up long-term objectives to develop a city and link to other plans by evolving beyond the plan focusing on documents and suggesting a blueprint restricted by the urban management plan in order to play the role of boosting the quality of life as the long-term plan on the city space and physical environment. The urban management plan must be also improved to operate the target region system and district unit plan which are the core elements of the plan in a mutually supportive relationship. Changes in the target regions and district unit plans should not be based on the urban comprehensive plan, but carried out by deliberation of the local autonomy, residents, land owners and developers upon the development plan contents and project execution conditions if an urban development project was scheduled.

Second, provided that the operation system of the urban management plan prevents occurrence of contingent profits, the government needs to redefine the standards for the regulations on land utilization in order to boost the balance of benefits from the urban planning decisions. The government needs to lower or reinforce the floor area ratio specified under local ordinances in the existing cities or guns(counties), and establish the standards to effectively control construction activities in order to encourage planned consolidation. In addition, standards to manage land utilization are required in the non-urbanized mountainous and agricultural areas to prevent troublesome small-scaled
developments and maintain the natural and suburban environment until the planned development is undertaken.

Third, the government must build a system to simultaneously develop the open and fair planning process, and produce substantial participation of the residents. To do so, the government needs to prepare fair and equal opportunities for the general citizens and parties interested first in order for everybody to take part in the process as an open participant and state diverse opinions in the prepared space. Furthermore, the government must create atmosphere that allows the residents to voluntarily partake in the official or unofficial forums before the lawful urban plans, etc. are carried out. Meanwhile, the government should reinforce the procedural regulations to strengthen the opinion collection process in the beginning of the planning stage, enhance the public hearing & public display program, and implement the public inquiry system in order for the citizens and parties interested to obtain equal opportunities and fairly participate in the project. In addition, the government must also define the role of relevant agencies such as the urban planning divisions within the local autonomy, local committees, Urban Planning Standing Committee and Urban Planning Committee which are participating in the urban planning process.

**Policy Proposal**

Above all, the government should prepare the systematic devices as soon as possible in order to solve the problems in the current urban planning decision-making process with respect to the transfer of the right to approve the urban comprehensive plan, which should come to effect in the near future. Simultaneously, it is imperative to continuously improve systems related to elevating the land utilization & management function of the urban management plan, and preventing contingent profits from occurring due to urban planning decisions over the long term.

We expect more detailed and specific research projects to be conducted in the future to develop the urban planning decision process of Korea earlier.
As a step of an assignment to the New Capital Construction, this study aims to elicit public consensus on the New Capital Construction by accumulating basic data on the establishment of a future-oriented and rational plan to drive the New Capital Construction as a key task of the Participatory Government of Korea. In order to achieve this purpose, we should make various cooperation systems for inducing participation of specialists of each field in the construction plan.

Also, we should utilize creative ideas and find out solutions to the problems which are to be made in the construction process.

This study is processed by public subscription divided into designated task and free task to induce specialist's brisk participation:

- Public subscription is noticed on newspaper and homepage;
- Evaluation on subject of proposals is chosen to judge by a committee for selection on subject of the research;

Moreover, an advisory committee and forum are held to enhance the quality and to present the direction of the study.

- Inquiry commission management hold a conference and workshop.

This study consists of the following six themes; 1) Locational and Regional Policies 2) Capital Relocation Cases and the Impact 3) Urban Development system 4) Housing Development and the Urban Environment 5) Urban Design and Architecture 6) Transportation and Information System. These six themes of study are composed of 29 subject cases. The final report will be utilized as both a guideline of the plan.
establishment in the field of urban creation and construction and a basic data of system
development and policy alternatives.
Infrastructure and Construction Economics
III - 1

The 2nd 5-year Transportation Plan for Seoul Metropolitan Area
제2차 수도권 광역교통 5개년계획 및 추진계획

Nam-Geon Cho, Sung-Ho Oh, Jin-Kyu Chung, Jin-Ho Park, Dong-Jin Kang, Jong-Hak Kim

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Seoul is a capital city and the largest city of Korea with over 10 million population. Seoul metropolitan area (SMA) consisting of Seoul, Incheon and Gyeonggi province is sharing about 46.9% of population, while it shares only 11.8% of land in nation. Therefore the population density of SMA is about 1,938 persons/km², 4 times denser than the national average of 487 persons/km². Especially Seoul is about 16,857 persons/km² in 2002.

Some transportation problems confronted in SMA are summarized as follows. First of all, car dependancy is deepening with coupling road congestions over the SMA area. Even though suburban sprawl has been growing in the SMA, the suburban residents prefer to use cars. Low usage of bus and intercity rail makes the situation worse. Moreover, lack of transportation facilities like an electrified rail in SMA does not improve the travel conditions. Especially, intercity train does not compete with the car, because it has many stops which takes longer journey times than car. Little express intercity trains are operating in the limited sections. The other problems with transportation are deeply related with shortage of road supply and road capacity. The one of the main reason why the travellers does not take the intercity train is inconvenient transfer of multi modes. Still, there is no comprehensive multi modal transfer center, where anybody is able to transfer any kinds of transport mode at one place.

Owing to its insufficient transportation facilities, inconvenient usage, severe road congestions etc, SMA is now paying lots of social costs which involves as follows. First, road congestion costs are increasing, estimated as 12 trillion won per year, sharing 56.1%
of the nation costs. Second, environmental condition is worsening with high emissions from vehicles, forcing health threat of the travellers as well as the residents. About 43% of vehicles are registered in SMA. Third, traffic accidents are on the verge of occurring. More than 121,000 traffic accidents occurred in SMA which brought in about 2,540 lives in 2002. Such severe problems are facing innovative and basic treatments to ameliorate the situations in SMA.

The 1st 5-year Transportation Plan(1999-2003) for Seoul Metropolitan Area was completed at 2003. The plan was established according to the Special Act on Metropolitan Traffic Management in Large Cities in 1997. Now the 2nd 5-year plan(2004-2008) is needed to select alternatives including their propulsion plans. And the plan must comprehend the result of the 1st 5-year plan, the plans related with transportation in the area and the pending problems of commissions.

At the beginning, this research accomplishes the inspection of propulsive status for planned projects, the user surveys, commission visit, and others to analyze 1st 5-year Transportation Plan for Seoul Metropolitan Area. And then, it is established 3 main goals, which are establishing public transport system oriented, investing transportation facilities with low cost but high efficiency and enhancing transport demand management policies. Also, the present conditions and future traffic circumstances were analysed, so it is selected object projects of the 2nd 5-year plan and it is provided their sectional propulsion plan through the conferences with commission and MOCT(Ministry of Construction and Transportation).

This plan has been strengthening public transport system, such as BRT introduction, insurance of park&ride lot and etc., expansion and operation of main arterials and metropolitan subway networks, and increase of capacities on main arterials.

This plan will contribute to reorganize public transit in core of transportation system. And it is prospected that speed of metropolitan subway keeps average 50km/h, 40km/h for arterials, 56km/h for highways in the Seoul metropolitan area due of expansion of continuous metropolitan subway network and arterials as mentioned in the plan.
Busan is the second largest city, with the largest port in Korea. The total amount of port freights including export and import freights is about 165,700 tons, sharing 17.7% of national port freight. Particularly, container freights are mainly transported to Busan port, sharing 79.5% of national container freights in 2002. The total amount of container freights of Busan port is about 9.45 million TEU, while 11.9 million TEU for nation.

Busan is the major gate in the world. The container freights dealt in Busan is the fifth in the world in 2003 followed by Hong Kong(HK), Singapore, Shanghai, Shenjeon. The ranking place downed from 3rd place in 2000. Therefore, it is expected that competition with the China will be more severe than before in the field of container transport or treatment, because the increase rate of container freight treatment of the China ports shows very sharp as 23.9% ~ 38.7% per year, while the rate is only -0.9% ~ 6.9% per year for HK and Singapore etc.

When considering these container market environment in the world, Busan has to make its competition power by increasing the capacities of container freight treatment, ameliorating road congestion by building port supporting road.

Busan has been promoted to connect the missing link of the supporting road of Busan Port(New Busan Port ~ Myeog ji Bridge ~ South Port Bridge ~ North Port Bridge ~ Gwang An Bridge ~ GyeongBu Expressway). This study aims not only to prove the construction feasibility of supporting road of Busan Port by analysing the future cargo/container transportation and traffic volumes when connecting the missing link, but also to manage a reasonable financing plan.
The major contents dealt with this study are as follows. First of all, the socio-economic indicators of Busan and its surrounding areas in relation to this supporting road of Busan port as well as the present conditions and plan of cargo transportation were analysed. Second, travel demand after connecting the missing link was analysed by using the O-D traffic volumes and networks of Korea Transport Data Base (KTDB). Third, economic evaluation was carried out on the connecting of supporting road of Busan port. As a result of cost-benefit analysis, B/C was 3.2 which meant the road project was very efficient and important. The supporting road of Busan port seemed to play a very important role in Korea when comparing with the other ports of cities, considering the rates of port freights.

Moreover, AHP (Analytical Hierachy Process) was applied to some experts to find the way to supply construction revenue for supporting road of port. It shows that national support is needed for supporting road of Port construction.

This study has confirmed the feasibility of construction for supporting road of Busan Port and managed national supporting base for construction of supporting road.
Especially, this study contributed to promotion of continuous construction for missing link in supporting road of Busan port.

III - 3

Comprehensive Plan for The Median on the National Roads(Step 2)
중앙분리대 종합기본계획 수립 연구(2단계)
Kyeong-Suck Kim, Jin-Ho Park, Seung-Lim Kang, Ki-Yong Kim

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The government is making constant efforts to reduce traffic accident death. As a part of these, the Ministry of Construction & Transportation is enforcing the median establishment work which evaluates to decrease effect of traffic accident death.

Recently, the design standard of the national road is high standardization, but it is occurring traffic accident on the existing road because it has too narrow width and has insufficient road safety facilities.

Accordingly, the government has established the median to reduce the traffic accident caused by center line violation on 4-lane national road since 1997. The median is the best safety facility to prevent a head collision of vehicle on the road. Therefore, it is necessary to devise a plan for preferential establishment of the median at the 4-lane national road.

This study as the continuous study of step 1 - the Comprehensive plan for The Median on the National Roads - is firstly for the basic design which corresponds to environment of the establishment of an object road to use database in detailed investigation about geometric of road.

Second purpose is to make a decision to establish ranking about the median on 4-lane national road. When we decide ranking, we use the data such as results of traffic accident
analysis, geometric of object road, and cost-benefit analysis.

According to these purposes, we studied 7 subjects which are as follows:

• A standard of design establishment related to the median;
• Retail investigation, geometric analysis about object road and the median type selecting;
• Presentation for Road-traffic safety facility integrated operation plan of 4-lane national road;
• Investigation for traffic safety facility operation plan of foreign nation;
• Analysis of problem causing the existing median on the road;
• Making a decision to establish ranking about the median on 4-lane national road;
• Making a basic design drawing about object road which needs establishment of the median.

It is necessary that road-users are able to drive in the safe and comfortable condition on the road. If it is not considered, traffic accident will increase. Therefore, road designers and managers must consider it when they are designing and constructing roads. This study will help you when you design and construct the road.

Under the circumstances where the reform for the decentralization at the pan-government level has shown its concrete shape, the discussion about the decentralization
in the public project procurement sector is urgently required.

So far, the autonomy and discretion allowed to individual public procuring entities have been limited due to the centralized procurement system, and regulation and intervention by central government. There have been much inefficiencies occurred in the procurement administration, because the entities could not procure properly to the characteristics of individual projects and the requirements of theirs.

The purpose of decentralization in the public project procurement sector is to enable the individual procuring entities to procure based on their own authorities and responsibilities or accountabilities so that they execute the projects proper to the characteristics and demands of the regions and the projects.

Under the recognition of these problems, the purpose of the study is to derive the decentralization strategies and directions through the analysis about the factors affecting the decentralization in the public project procurement administration and the foreign case studies starting from the discussions on the concept of the decentralization in the procurement administration for the public project, and operational situations and problems in the Korean procurement administration.

To execute the study, literature review to search the former studies, foreign case studies, surveys by questionnaire and interviews, expert meetings were performed. Empirical analysis by Structural Equation Model(SEM) was also executed.

Each chapter is summarized as follows.

In Chapter 2, the meaning of decentralization in the procurement administration of the public projects was discussed. Especially the relationship between the concepts of decentralization and autonomy was examined. The fact that decentralization is based on the procurement entities' capabilities was also emphasized, and the concept of the procurement entities' capabilities was defined. In addition, the necessity of the decentralization in the procurement administration of the public projects was discussed starting from the general discussion about the positive and negative effects of decentralization.

In Chapter 3, the operational situations and problems of the procurement
administration were analyzed. They are classified into 1) regulatory environment aspects, 2) organizational and behavioral aspects, 3) procurement administrative capability aspects. According to the analysis, the overall weaknesses of the autonomy and discretion in the Korean procurement administration were found.

That is, the exercise of the discretion power in Korea is limited by the uniform regulation and the audit system based on the sizes of the projects even in the case where the procurement entity has the discretion power. In terms of procurement entities' capability, the differences of capability among types of the procurement entities are not reflected on their procurements.

In Chapter 4, the factors which affect the decentralization of the procurement administration for the public projects were analyzed by the application of Structural Equation Model. At first, the factors which affect the decentralization of the procurement administration were classified into 1) project characteristic factor 2) regulatory environment factor 3) organizational factor 4) human and behavioral factor 5) procurement competence factor. With respect to these factors, the model was established and the revised model was suggested based on the observed data. According to the result, procurement competence, i.e., bidding contract management competence and project management competence as independent variables and parameters affects decentralization. The result also showed that regulatory environment factor, organizational factor, and characteristics of projects affect procurement administration directly or affect decentralization indirectly through procurement competence.

In Chapter 5, foreign cases, especially, the frameworks of the procurement administrative systems and operational cases in U.S., Japan, and U.K. were explored. Foreign case study was performed centering on legal and regulatory system, project delivery methods, level of decentralization and autonomy, situation of procurement competence and corruption control mechanism. Policy implication was derived through the foreign case study.

In Chapter 6, the basic direction and strategy for the decentralization were suggested based on the result from the previous chapters. As a decentralization method presented
in this chapter, the differential decentralization strategy which reflects the differences of procurement capabilities among types of public procuring entities is introduced, and procurement capability is chosen as a criteria for differential decentralization. The differential decentralization method centering on bidding and contract administration was also suggested. Next, the method to arrange legal and regulatory environment for the decentralization of the procurement administration and the method to improve the procurement ability were discussed.

Lastly, in Chapter 7, the conclusion and the future study were suggested.

The decentralization reform has been paid attention as an alternative way of improving the competitiveness of a nation and regions in many countries. Accordingly the attention has been given to how to make a collaborative partnership between central and local government in providing public services.

This study aims, under aforementioned trends of regionalization of the central government's function, to provide some alternative ways of making the partnership between central and local governments to facilitate construction and operation of transport facilities, especially focusing on the sector of public roads, since the importance of road
is much higher than any other transport sectors in Korea. In order to achieve the study purpose, the study has three steps; the study first reviews the definitions of partnership between central and local governments from three different standpoint; regionalization trend, governance system and solution of social conflicts.

It is also examined that the actual conditions of intergovernmental relationships regard to the investment of public road in terms of construction, operation and management of roads. The second step is to investigate and draw implications from experiences of foreign countries as Japan, USA and France employing the intergovernmental cooperation system. The final step is to suggest an implementable model of intergovernmental agreement system to help make the partnership between central and local governments to facilitate construction, operation and management of road facilities, based on the existing problems and experiences from foreign countries.

The scope of the research and corresponding major findings are as follows.

First, three theoretical aspects of intergovernmental relations, decentralization and governance, redistribution of central government functions, and solution and management of intergovernmental conflicts are incorporated for the development of conceptual framework. These theoretical aspects, through a close linkage of theories, support to suggest an alternative to develop the partnership between central and local governments to facilitate construction and operation of roads. Examples of intergovernmental cooperation from Japan, USA and France suggest that the French model of plan contract system can be used as a bench mark for Korea.

Second, existing intergovernmental cooperation system between central and local governments is examined for the identification of current problems in terms of road planning agreement, operation and management of road, administration structure, and finance system. Excessive subdivisions and restriction of the usages of grant-in-aid from central government cause difficulties for the promotion of strategic road projects of regional governments. Other problems are also identified; the inability to reflect local characteristics such as economic and fiscal conditions for the redistribution of fiscal resources to manage and operate the roads, a lack of coordination between regional
development plan and road plan

Third, an implementable model of intergovernmental agreements in road planning, operation and management is proposed, which can be executed under the Korean system of local autonomy. The model is consisted of several components, including the scope and contents of proposed road projects, the duration of the agreement, the share of expenses, the guidelines, negotiation and deliberation of the proposal. The study also emphasizes the gradual approaches to prevent potential side effects of the new system to be introduced. It is also expected that the partnership between central and local governments will transform to partnership with interdependence relationship and then will be more efficient in road construction and management.

III - 6

Effects of Transport Environmental Improvement by Integrating BRT and Road Pricing Measures
BRT와 혼잡통행료의 통합시행에 따른 교통환경개선효과에 관한 연구

Hun-Ki Lee, Jong-Hak Kim

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Transport demand has dramatically increased for a couple of decades. It is reported that average car traffic increased by 30-35% between 1970-1990 in European countries. Korea has also experienced the rapid increase of car traffic and number of registrated cars have escalated by more than three times between 1990-2001 with an average growth rate of 8.6%.

Contrary to the rapid increase of transport demand, transport facility has been provided with little growth rate because it has needed enormous funding. For example, road supply has increased by only 1.2 times for the same period. Unbalance between transport demand
and supply has brought various transport problems, e.g., traffic congestion, noise and environment deterioration, etc.

Package approach has been one of alternatives to alleviate the transport problems. This approach has advantages of enabling to generate synergy effects by integrating relevant transport measures and to make social consensus more easily for implementing transport projects. This study aims to examine to what extent benefits amount, by integrating BRT (Bus Rapid Transit) and road pricing measures in a way suggested in the package approach, in terms of social acceptability, travel behavior change and reduction effect of air pollutant emissions. Major findings can be summarized as follows.

First, the integration of relevant measures can be effective and efficient to improve social acceptability. The road pricing measure that was taken as a representative TDM (Transport Demand Management) measure in the study cannot be welcome to road users even though public transport users can accept it without complaints. This kind of opposition by road users was reduced by around 20% under an assumption that BRT and road pricing measures would be implemented at the same time. This result gives implication that the way of integrating relevant transport measures can be an effective tool to raise social acceptability.

Second, the integration of relevant measures enables to improve usage of public transport and to reduce air pollutant emission. Simulation results show that amount of air pollutant emission can reduce by three to six times compared to scenario of introducing only BRT system. It can be interpreted that benefit of introducing BRT which requires vast investment for its operation can be duplicated or triplicated by conducting simultaneously some relevant measures such as road pricing which requires little investment.

In our country, various transport measures have been implemented but benefits have been very limited mainly due to those projects' individual or non-systematical implementation. In order to improve the benefit of the transport projects, it is strongly recommended that relevant transport measures should be mutually integrated.
Korea has become one of the countries to have a high-speed rail in the world since the Korean high-speed rail is introduced in April 2004. The Korea Train Express (KTX), high-speed rail, has reached speed of up to 300km/h. Opening the section between Seoul and Daegu (Dong-Daegu station) in April 2004, the remaining section between Daegu and Busan is scheduled to be completed by 2010. Until the second line is built, the KTX will run on the conventional rail between Daegu and Busan.

After the first opening of the KTX in April 2004, travel time between major cities has been dramatically reduced. The reduction rates range from 32% to 47%. Considering travel time reduction between major cities, this study concerned about the intercity travel impact of the KTX operation. Especially, this study aimed to examine access area of the KTX station, and to analyze access mode choice behavior for intercity travel. To fulfill the aims of this study, Dong-Daegu Station was selected as a station for a case study.

This study takes place in three stages. These are 1) descriptive statistical analysis of transportation status before and after introduction of the KTX, 2) examination of access area of the KTX Dong-Daegu station, 3) empirical model estimation for analyzing access mode choice behavior. This study makes use of the data from travel survey from Daegu metropolitan area. The main part of the survey was carried out in the KTX Dong-Daegu station. The data was collected from a sample of 1,770 individuals. The survey data
includes the information on travel from Dong-Daegu station to Daejeon and from Dong-Daegu station to Seoul.

From descriptive statistical analysis of transportation status before and after introduction of the KTX, it is found that revealed demand of the KTX is lower than that expected. Moreover, it is found that the low demand of the KTX stems from high cost of the KTX itself and inconvenience (including travel time and cost) of access mode.

In order to examine access area of the KTX Dong-Daegu station, three analytical methods are employed. The methods are ANOVA of survey data, accessibility analysis, and Ward method. It is found that direct access area of the KTX Dong-Daegu station includes whole area of Daegu City and Gyungsan City by employing the three analytical methods. Furthermore, it is found that indirect access area of the KTX Dong-Daegu station includes Yeungcheon City and Chilgok County.

In order to analyze mode choice behavior for accessing Dong-Daegu station, multinomial logit model structure is used. For the model specification, a variety of behavioral assumptions about the factors which affect the access mode choice, were considered. From the empirical model estimation, it is found that access travel time and access travel cost are significant in choosing access mode. Given the empirical evidence, we see that improvement of access transportation system for Dong-Daegu station is very important for enhancing the use of KTX.

Although this research provides an addition to our understanding concerning access area of the KTX station and mode choice behavior for accessing the KTX station, future research remains to be done in the following area. 1) By considering construction of the remaining section of KTX between Daegu and Busan, which is scheduled to be completed by 2010, further investigation and modeling are recommended. 2) Empirical modeling with market segmentation can be undertaken for a variety of policy analyses.
By mending an act titled “Construction Technology Management Act” in 2001, all authorities have to publish an ex-post evaluation report on the construction works which must consist of survey and analysis of the construction works, and its effectiveness. Therefore, this study aims to evaluate the ex-post projects, including Seohaean, Chungang, and Daejeon-Jinju Expressway, which opened in 2001 and to adjust some items in the ex-post evaluation guideline to be analysed.

The 3 routes had different lengths and construction durations but opened all routes in 2001 simultaneously. The longest one is Seohaean Expressway along the western seashore line from Incheon to Mokpo, 349.6km, which opened its part sections in 1998. The Chungang Expressway connecting Daegu and Chuncheon, 278.5km, which is located in the middle of the nation in the direction of south to north. Daejeon-Jinju Expressway connecting these two cities, 160.3km, which runs through from south to north direction. All routes have basically 4 lanes but some sections of Seohaean Expressway over the populated areas in Seoul metropolitan areas has 6 lanes.

To analyze the related information covered by the 3 expressways, socio-economic indicators were searched and interviews and questionnaire surveys to residents and road users were performed. Some before-after comparative analysis on construction costs and periods were done. This kind of comparative analysis were done in Korea for the first time, by the guideline on the ex-post evaluation.

The traffic volumes forecast at the time of plan showed some frustrations depending on the sections and locations when comparing the current traffic volumes. It was found
that traffic volume forecast seemed to be underestimated in the sections near the large
cities, but it is overestimated near the rural areas.

The major reason why use the expressways is saving of travel time. The next one is
different depending on the routes. It was estimated that most travellers thought saving
under 30 minute of travel time was expected for the basic toll which he/she paid.

The direct effects from the opening of 3 expressways were applied by the general
economic appraisal methods. According to the economic appraisal methods, the direct
benefits included travel time savings, vehicle operating costs savings, savings of
environmental impacts reduction and traffic accident reduction. The direct benefits
estimated as 876.3billion won per year meant that construction costs were able to be
recovered within 11 years after opening the 3 expressways. The indirect effects from the
3 expressways were measured by using the accessibility index. The spatial accessibility
index and economical index calculated from the equations as follows. The economical
index is applied by the number of employment of each city, so it is more affected by
the large cities.

\[
A_i = \frac{1}{n(n-1)} \sum_{j=1}^{n} \sum_{j, j \neq i}^{n} s_{ij}
\]

\[
A_i = \frac{1}{n(n-1)} \left( \sum_{j=1}^{n} \frac{M_j}{s_{ij}} + \sum_{j=1}^{n} \frac{M_i}{s_{ij}} \right)
\]

where, \( A_i \) = accessibility of each city

\( n \) = number of cities

\( M_i, M_j \) = number of employment of i or j city

\( s_{ij} \) = travel time between city i and j

About 10.2 minutes of travel times were reduced between all cities in the nation by
constructing the 3 expressways. Although land prices were assumed to be affected by the
accessibility improvement from expressway networking, no relation was found between
land price and expressway construction.
It was found that lots of direct and indirect effects came from the expressway construction. This study recommended to adjust the evaluation periods and evaluation items in order to perform efficient ex-post evaluation on the construction projects.

By mending an act titled “Construction Technology Management Act” in 2001, all authorities had to publish an ex-post evaluation report on the construction works which must consist of survey and analysis of the construction works, and its effectiveness. Therefore, this study aims to analyse the before and after socio-economic changes including travel demands, some impacts and effects on the region and tourism development on the Changsun-Samcheonpo Bridge opened April 2003. Changesun - Samcheonpo Bridge which connects Sacheon city of inland and Namhae-gun of island along the seashore of the Gyeongnam province(figure) which consists of the other 4 bridges connecting 4 islands.

The bridge was planned to promote tourism industry of the study areas where were famous for their beautiful landscape and to stimulate regional economy. Therefore, it has taken 8 years and 5 months to open to the public since 1994. The reason why it took such a long time to complete was owing to several changes of bridge design; number of lanes of bridge changed from 2 lanes into 3 lanes, and some related road structures design followed.
In order to review the construction project, some surveys on the socio-economic indicators, interview and questionnaire surveys to the residents and road users were undertaken. Before-after comparative analysis on the construction costs and periods related to the bridge construction was performed.

According to the interviews with road users and residents, most of them told that savings of travel time were great benefits for them. (the time savings span is 31 and 37 minutes). However, there were some complaints about longer travel time due to road congestion on weekend jammed by lots of cars.

Other benefits of the travel time savings are as follows. First of all, easy access to both regions became possible. Before the bridge open, most travellers had to use small ships to cross the sea, and the travelling was limited before sunset. The second benefit is the cost saving of transportation between two regions by cutting travel time and travel cost for purchasing and selling some agricultural and fishery products. The third benefit is easy access to hospital service when facing in emergency at huge city. It was very difficult and dangerous to transport patients to large hospital when the emergency situation occurs at night. Such benefits are difficult to count money value, but it is clear
that the bridge improved the quality of life of the current islands' residents very well.

The direct and indirect effects from the bridge were analyzed using the general transport investment appraisal methodologies which include travel time savings, vehicle operating cost savings and savings from environmental impacts reductions and traffic accidents reductions. Indirect effects on the tourism development were estimated by the regional I/O model.

The direct benefits from the bridge estimated as 67.3 billion won per year looked like to recover the construction costs within 4 years, which showed the successful results. The indirect effects on the tourism industry analyzed by the regional I/O model estimated the effects on production profits as 16.3 billion won per year, on jobs as 187 persons per year and on earning growth as 7.8 billion won per year.

From this study, it has been found that the bridge connecting between inland and island had great positive effects such as tourism development, regional development. This study suggests some adjustments on the evaluation period and the items to be analysed in order to set up reasonable ex-post evaluation.

Background and Purpose

Since the investment plan for lane expansion were established for each route and section of the existing highways in 2002, a necessity to consider relevant condition
changes has been emphasized as new road plans were set up. Accordingly, the purpose of this research is to reflect road plans promoted after the investment plan for lane expansion was formulated in 2002, and to set up priorities of expansion investments in the national principal highway network in consideration of financial conditions at Korea Highway Corporation (KHC).

**Summary**

For this research, we examined the current status of the existing highways and plans related to the national principal road network in order to utilize them as basic data for the traffic demand analysis.

When analyzing the traffic demand, we predicted the traffic volume for each vehicle type and zone in a target year based on the estimated social & economic indices of the population per traffic zone, number of automobiles owned and total production amount within each region. In the phase of traffic distribution, we used the “Entropy Maximization” method having the regional traffic distance as the traffic resistance. In addition, we finally predicted the traffic volume per highway section and vehicle type for each future target year by forecasting the traffic demand conversion by highways in order to search for ways to lower the already estimated express railway user population in the future from the road traffic demand in the future.

By using the results from the traffic demand analysis, we selected target sections to expand highways. Primarily, we analyzed the traffic volume/capacity (V/Cd) for each route and section in each future target year, chose sections whose V/Cd exceeded 1.0, and selected the preferred assessment target sections for the highway expansion investments.

When assessing the expansion investment priorities, we looked at the traffic demand (V/C), economic feasibility (B/C) and assessment items from the traffic safety aspect in order to formulate the assessment items and weights. After standardizing sectional measurements based on these judgment standards for each assessment item, we applied the weights and calculated the general assessment index for each section to come up with the investment priority assessment results.
Lastly, we proposed the time to promote projects in consideration of financial conditions at KHC according to the investment priority assessment results for each section, and derived direct & indirect wave effects during the promotion of expansion projects.

In order to implement the metropolitan transportation policy effectively, the Special Act for Metropolitan Transportation Management should be revised. It is noted that the act has played very important roles as powerful tools for managing and resolving metropolitan transportation issues including bottleneck problems between the city limits. However, several issues of this act have been still pointed out and the necessity of revision has been discussed for more effective metropolitan transportation policy. In this study, we have reviewed the existing Special Act for Metropolitan Transportation Management and proposed the basic revising direction of the act. The major issues to be discussed are as follows;

Above all, the Metropolitan Transportation Plan needs to be established with the long-term (e.g. 20 years) vision like other national-level road planning for addressing various metropolitan transportation problems. The plan should have its own power and institutional tools for coordinating metropolitan-level plans with national-level and city-level plans. Especially, the arterial roads of metropolitan area should be functionally classified with the VTLI (Volume Trip Length Index) method and be constructed as
seamless and bottleneck-free networks. For this, the ratio of national subsidy for metropolitan road and rail construction should be increased to resolve the financial difficulty of local government with the newly-proposed calculating method.

On the other hand, the charging system for Metropolitan Transportation Facility should be also revised. It is recognized that the system has been financially contributed to the construction of efficient metropolitan transportation environment. However, existing criteria for imposing, reducing and exempting the charges have logical and practical limitation to be addressed. The study has presented some of the solutions including newly-developed charging methods and logically-arranged charging criteria.

Abstract

The low income groups' housing stability is main object of housing and social welfare policy. A comprehensive plan of housing (2003 ~ 2012) treats the low income groups' dwelling welfare elevation an important subject. Ten hundreds thousand units of public rental housing will be supplied in next ten years, management of public rental housing has risen to main subject of housing policy. For preparing in this situation, it is necessary to study on establishment of efficient housing management system.

This study are consisted of 5 contents as follows: Chapter 1 described necessity, purpose, method of study and main preceding this study. Chapter 2 shows to present condition and management policy of public rental housing. Chapter 3 views problems to the management condition of public rental housing, and management of public rental housing. And chapter 4 considered an international comparative study on management system of public rental housing. It includes England, Japan and Singapore. Chapter 5 suggests to induction of some strategies for improving of dwelling qualification standard, and efficiency of facilities management. Chapter 6 defines reorganization of system of public rental housing, and direction for establishing of governance system of housing management.

Public rental housing performs definite policy way to achieve the low income groups' dwelling stability as well as function of social welfare resources. Construction of efficient
rental housing management system is one of the important policy subject. In order that governance system of housing management settles successfully, the government function, tenant management commission and establishment of public housing management organization is essential.

In September 1997, The Korean Government established the Comprehensive Plan for Intelligent Transport Systems(ITS) to provide basic frameworks of ITS deployment in Korea. The plan emphasized the importance of ITS standardization to ensure the nation-wide interoperability and compatibility in the process of deploying various ITS projects. The plan also specified that MOCT(Ministry of Construction and Transportation) shall have the initiatives of ITS standardization by promulgating ITS standards as its ministerial standards. In this context, MOCT has established National ITS Standardization Program of Korea(NISP-K) in the late 1998. NISP-K was basically to facilitate the way for the successful deployment of ITS in Korea. Hence, the objectives of NISP-K are to provide basic principles for integrating various ITS projects, to achieve the nation-wide interoperability and compatibility among ITS user services and systems, to promote domestic ITS research and development by understanding international trends of ITS technology and to harmonize with global ITS standardization activity. During the last five years, Phase I, II, III and IV of NISP-K have been successfully completed and the Phase
V has been initiated in 2004.

In this Phase V program, 6 work items were developed as follows; the revision of the Comprehensive Plan for Intelligent Transport Systems (ITS), the development of the object-oriented ITS architecture, the application of UML method for standard design of ITS sub-systems, the standardization of the evaluation methods for each ITS sub-system, the development of the message set for ITS Road Side Equipments Part 1, and the construction of the national standardized node-link ID networks.

Based upon the ITS standards needs survey, we have updated comprehensive national ITS standardization plan which was established in July 2002. Also, we have presented an object-oriented method for ITS using UML (Unified Modeling Language) technology. Especially the method has been applied to the information architecture of Bus Information System (BIS). Finally, two draft association standards including a message set for roadside equipments and node-link identification formats have been developed, which will be used for securing integrated information interfaces among the various ITS infrastructure throughout the country.

Although there have been systemic efforts of the government to solve the metropolitan transportation problems, demand and supply for transportation facilities are
not matched, yet. Although hardware-side policy, such as providing road and rail facilities and software-side policy, such as transportation demand management, to solve the problem is not being actively implemented. Scenario analysis by integrating land use and transportation has been popular in developed countries as a tool of metropolitan transportation policy making, and it can be adaptable in the metropolitan areas of Korea.

Purpose of the study is to develop a model to help policy decision making for metropolitan transportation by setting policy scenarios of land use and transportation integration. Study area includes the six metropolitan areas of the country. Evaluation factors for each scenario include aspects of effectiveness, economics, equity, integration, and environment. This study is the first step of the two-year projects. During the first year, an integrated model is developed considering economic and environmental aspects. The model will be expanded and tested in the second year.

The model consists of six sub-modules. Module 1 suggests methods of scenario's goal setting such as auto or transit-oriented transportation policy. Module 2 is a selection of policies and elements about land use and transportation. Module 3 sets scenarios by explaining land-use and transportation system of future metropolitan areas. Module 4 suggests methods of forecast including QV function. Module 5 evaluates effectiveness of each scenario. Module 6 selects the best scenario that matches goals of transportation policies.

The model which is composed with the six modules contains elements of both land use and transportation aspects, and suggests forecasting method that contains the software-side policies. As a first-year work of the two year project, this study minimizes input(policy) factor and output(evaluation) factor, and judges the possibility of model application. As a main application of the analysis, the QV model considers equilibrium status of land use and transportation, and will enable governments to implement the policy: “linked development between land-use and transportation.”

Limits of the study includes three aspects. First, this study does not consider various elements of land use and transportation. Second, objectivity of the applied weights and
The new town is generally understood as one of the effective policy measures for solving many problems of overpopulated megalopolis. In Korea, some new towns have been planned and developed near Seoul City since late 1980s, mainly for controlling the population size of Seoul City and meeting the needs of housing facilities. However, all of them were designed as high-density bed towns without sufficient public transportation facilities. They were criticized with low job-housing balance or high dependence on central city, Seoul, and subsequent serious traffic problems.

The current study is for evaluating the impact of new town development strategies to the travel demand and energy consumption in metropolitan area, specifically for Seoul Metropolitan Area in Korea. Basically, 2 scenarios of new town development were built for Seoul Metropolitan Area. Scenario 1 set 10 positional new towns, fairly large cities (population size of 200 thousands or more) that developed at main regional corridor areas far from about 40 to 60 km. Scenario 2 set 22 residential new towns, relatively
small cities (population size of about 100 thousands) dispersed near Seoul. Each of them was divided into 4 cases depending on the percentages of commuters and students bound for Seoul (10% and 30% for Scenario 1, 30% and 50% for Scenario 2) and the travel shares of highway modes (40% and 60% for Scenario 1, 60% and 80% for Scenario 2) and totally 8 cases were made.

For each of 8 cases, travel performance (in VKT and VHT) for commuting and attending school and the amount of energy (in TOE) consumed for the highway travel in Seoul Metropolitan Area were estimated using travel demand forecasting model established in the Transportation Planning for the Seoul Metropolitan Areas (a policy report by the MOCT and other research institutes in 2000). Main results of the analyses are summarized as follows.

First, analysis results showed that for the policy objective to reduce travel performance (in VKT) or energy consumption (in TOE), Scenario 2 (residential new town strategy) is more effective than Scenario 1 (positional new town strategy) on condition that the percentage of commuters, including students, in a new town bound for Seoul should not be higher than 30% and the share of highway modes should not be higher than 60%.

Second, for considering the commuters' cost of wasted travel time due to delays and congestion, Scenario 1 may be more effective than Scenario 2, on condition that the percentage of commuters bound for Seoul could be kept low, in about 10%. In the large, cases in Scenario 2 showed much higher percentages of seriously congested highway links, in which V/C is more than 1.0, than ones in Scenario 1.

The current study produced some interesting and meaningful results, but had limitation in building scenarios and evaluation criteria. More various scenarios/cases and evaluation criteria will be able to produce more meaningful outputs.
Recently, several local governments in the Metropolitan area are competitively introducing the Intelligent Transportation Systems (ITS) as a solution for maximizing the capacity of the existing traffic facilities, faced by rapidly increasing traffic demands. As a leading municipal government in the area of ITS, Bucheon city introduced the Bus Information System (BIS) prior to other local governments, and now establishes a comprehensive master planning of ITS.

The purpose of this study is to establish a comprehensive planning for implementation of ITS business, which provides systematic and efficient transportation systems. More specifically, this study suggests a local ITS architecture which is different from other master planning, and makes an endeavor to provide distinct results of the benefit-cost analysis and economic valuation results using a simulation program.

This study can largely be divided into two parts: establishment of ITS master planning; and design of a traffic information service center. For establishment of ITS, analyses of the existing conditions, trends, and problems, concreteness and design of ITS master planning, and composition of ITS architecture are implemented. For designing of the traffic information service center, the layout, and method of linking traffic information service centers in other areas are provided. In addition, this study provides efficient business propulsion scheme and quantitative evaluation of ITS benefits.

In order to reach a consensus on selection of the ITS systems, the opinions of citizen, taxi drivers, bus drivers, and related public officers are collected through a survey questionnaire. Through a completed field survey, the location and scale of the
Finally, 16 ITS sub-systems are selected including Urban Arterial road Traffic Signal Control Sub system (UATSCS), Urban Arterial road Prior Traffic Control Sub system (UAPTCS), Urban Arterial road Wide Area Traffic Signal Control Sub system (UAWATSCS), Urban Arterial road Traffic Information Sub system (UATIS), Urban Arterial road Incident Management Sub system (UAIMS), Electronic Toll Collection Sub system (ETCS), Public Transportation Integrated Fare Collection Sub system (PIFCS), Basic Information Broadcasting Sub system (BIBS), Regional Traffic Information Center Sub system (RTICS), Pre-trip Traveller Information Sub system (PTIS), City Bus Information Sub system (CBIS), Speed Reduction Section Roadside Warning Sub system (SRSRWS), Parking Information Sub system (PIS), Parking Enforcement Sub system (PES), Resident Prior-parking Enforcement Sub system (RPES), Urban Arterial road Pavement Management Sub system (UAPMS).

Bucheon Traffic Information Center (BTIC) is designed as a three-story building having 965m² in total floor area (TFA). It includes a visiting room, a comprehensive information room, a broadcasting room, and several office rooms.

This ITS projects will be implemented over the three phases by 2013. The expenses will be 19 billion won for the first phase, 22 billion won for the second phase, and 17.3 billion won for the last phase.
Jeju City has a great difficulty in providing good traffic services as an international tourism city and international free city, due to monocentric urban structure, high car ownership, bus-route concentration, and insufficient parking spaces.

For this reason, the objectives of this study are: to develop public transportation oriented Jeju City; to establish middle-to-long range traffic solutions; to operate human-centered and environmentally friendly transportation systems; to provide parking facilities systematically; to build scientific management systems; and to construct a public transportation model city, which corresponds to the local feature of Jeju City.

The main contents of this study can be divided into three parts: 1) establishment of middle-to-long range transportation vision master plan; 2) construction of a public transportation model city; and 3) establishment of middle-to-long range comprehensive parking management master plan.

For effective drive for this study, a census targeting whole Jeju City to grab actual parking conditions is implemented. In addition, field survey, expert survey, and development of a bond of sympathy between public officers and us in charge of advanced policies are executed.

As a major finding, it is realized that the future transportation policy of Jeju City must focus on human-centered and environment-friendly transportation system management (TSM) discouraging private car use, and efficient transportation operation policy taking an advantage of a state-of-the-art technology.

More specifically, this study suggests 43 sub-policies in 11 sections over three phases,
which concern bus priority system, transit mall, transfer facility, bus line system, public management, traffic fare system, bus service, operation, administration, budgeting, laws, etc. As major parking policies, 22 subjects in 6 sections, which deal with loading parking, CBD parking, parking operation, residence priority parking, parking space supply, management, etc. are suggested. As short-term policies, time-allotted loading parking, residence priority parking, green parking, opening of attached parking lot, etc. are proposed. It is also suggested that the regulation of illegally parked cars must be administered consistently.

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Pre-feasibility and Financing for Second Gyeongbu Expressway
제2경부고속도로 예비타당성조사 및 재원조달방안 연구
Il-Ho Chung, Sung-Ho Oh, Dong-Jin Kang, Hyun-Gil Park

December 2004 · 270 pages · Korean

The metropolitan area of Gyeongbu Expressway is not only Gyeongbu line and Honam line but also in charge of role of national arterial highway contacting south area of Seoul metropolitan and Seoul. However, the expressway was lost its function because of traffic tie-up as 25km/h of average speed caused by increase in traffic volume between metropolitan area and other area, active residential land development in south area of Seoul metropolitan and etc. Therefore, it is urgent to develop alternative line.

This study had tried to choose of most suitable line of Second Gyeongbu Expressway, through examination of number of lines for solution of common tie-up on Gyeongbu Expressway. Also, it was conducted to examine the possibility that private capital could be joined into Second Gyeongbu Expressway by considering economic and financial
propriety.

At the first, for examination of the most suitable line, possible areas for Second Gyeongbu Expressway were divided into 3 sections. For each section, the best alternative was selected through analysis of related planning, physical distance with other expressway, benefit vs cost, traffic demand and etc.. In a result of examination in a number of lanes required in Second Ring Road, on the basis of service level D, the section of Yongin–Gangdong requires 6 lanes, the section of Mokcheon–Yongin and the section of Osan–Yongin require 4 lanes. Table shows the best alternative in each area including belief explanation for the best line and required lanes.

<Table 1> Summery of Most Suitable Line in Second Gyeongbu Expressway

<table>
<thead>
<tr>
<th>Section</th>
<th>Summery</th>
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</thead>
</table>
| Outline of Line  | • Line which diverges at near 4km of south side in Mokcheon IC of Gyeongbu line, detours east side of Ansung-City-Yongin-City, passes Double-deck through between Sungnam-City and Namhansansung and newly-established Amsa Bridge, after that it is connected with Seoul–Yeoncheon Expressway.  
• Line which diverges at near 4km of south side in Osan IC of Gyeongbu line, pass west side of Yongin-City and merge into Second Gyeongbu line at Pogok-Myeon. |
| Extension        | • Second Gyeongbu Main line: L = 101.4km                                                           
• Branch line connecting Gyeongbu line: L = 20.1km                                                     |
| Construction Cost| $4,640M                                                                                           |
| B/C              | 2.3                                                                                              |

If toll is double of Korea Highway Corporation(KHC) and government help of 40% of total project cost, FIRR(financial internal rate of return) approaches expectation rate of return(9.2%) for Gangdong~Yongin~Osan. So, in case that construction cost is decreased in an effort and etc, it's possible that Gangdong~Yongin~Osan can have a
chance for a private expressway.

For Second Gyeongbu Expressway, it must be conducted in the future for more detail analysis to consider changeful environment such as relationship with N. Korea and shifting of population in metro area, because the road analysis is very liable to variation.

If Second Gyeongbu Expressway is conducted, Results are prospected that reducing the time is 8,300 million dollars, reducing the cost of operation is 800 million dollars and decreasing of traffic accident is 400 million dollars. Also, it is analyzed that required investment cost of Second Gyeongbu Expressway is 3,300 million dollars, production induction effect is 7,400 million dollars and employment induction effect is 5,000 persons.

The expressways in metropolitan area is losing its natural function as artery lines, which provide the mobility on long distance, because traffic volume increases yearly and, as a result, traffic congestion increases. Especially, as section of Seoul Ring Expressway in metropolitan area already reached capacity level, the mobility of the Ring Expressway is decreasing sharply. Therefore, it is urgent to develop alternation line.

This study had tried to choose of most suitable line of Second Ring Road in metropolitan area, through examination of number of lines for solution of common tie-up on Seoul Ring Expressway. Also, it was conducted to examine the possibility that private capital could be joined into Second Ring Road by considering economic and financial
### Table 1: Summary of Most Suitable Line in Second Ring Road in Metropolitan

<table>
<thead>
<tr>
<th>Section</th>
<th>Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Osan~Bongdam</td>
<td>• Consumption of West Suwon<del>Osan</del>Pyongtak expressway plan</td>
</tr>
<tr>
<td>Bongdam~Incheon</td>
<td>• Crossing Seohaean Expressway and connecting west and east boarders of the area as shortest line.</td>
</tr>
<tr>
<td></td>
<td>• $L = 41.39\text{km}$, • Speed = $100\text{km}$, • Required lanes = 6 lanes, • Construction Cost = $1470\text{M}$, • B/C = 1.6</td>
</tr>
<tr>
<td>Incheon~Ilsan</td>
<td>• Passing pier of the port of Incheon and the north port of Incheon, underpassing west side of Chungla and passing Yangchon in Kimpo</td>
</tr>
<tr>
<td></td>
<td>• $L = 34.25\text{km}$, • Speed = $100\text{km/h}$, • Required lanes = 6 lanes, • Construction Cost = $2950\text{M}$, • B/C = 1.2</td>
</tr>
<tr>
<td>Ilsan~Sudong</td>
<td>• Same line with 2nd West-East Corridor and through line into Pochun new town</td>
</tr>
<tr>
<td></td>
<td>• $L = 68.82\text{km}$, • Speed = $100\text{~80 km/h}$, • Required lanes = 4, • Construction cost = $15,691\text{M}$, • B/C = 0.3</td>
</tr>
<tr>
<td>Sudong~Hwado</td>
<td>• Connecting between Masuk area in Namyangju and Jinjup-Ub, as well as connecting south-north 4 line in future</td>
</tr>
<tr>
<td></td>
<td>• $L = 12.7\text{km}$, • Speed = $100\text{km/h}$, • Required lanes = 4 lanes, • Construction cost = $434\text{M}$, • B/C = 0.8</td>
</tr>
<tr>
<td>Hwado~Gonjiam</td>
<td>• Moving to east side from Gonjiam, crossing from Yangpyong-Gun Gangsang-Myon to Namhan River, and connecting south side 25km of Hwado JCT of Hwado~Yangpyong line</td>
</tr>
<tr>
<td></td>
<td>• $L = 47.15\text{km}$, • Speed = $80\sim100\text{km/h}$, • Required lane = 4 lanes, • Construction Cost = $570\text{M}$, • B/C = 0.5</td>
</tr>
<tr>
<td>Gonjiam~Osan</td>
<td>• Crossing west-north side of Yongin-City, passing Pogok area, connecting Gonjiam, and crossing at Second Gyeongbu line and Yongin-City Pogok-Myon</td>
</tr>
<tr>
<td></td>
<td>• $L = 29.75\text{km}$, • Speed = $80\sim100\text{km/h}$, • Required lanes = 4 lanes, • Construction Cost = $954\text{M}$, • B/C = 0.7</td>
</tr>
</tbody>
</table>

propriety.

At the first, for examination of the most suitable line, possible areas for Second Ring
Road were divided into 7 sections as mentioned on the 1st column in Table. For each section, the best alternative was selected through analysis of related planning, physical distance with other expressway, benefit vs cost, traffic demand and etc.. In a result of examination in a number of lanes required in Second Ring Road, on the basis of service level D, the section of Ilsan ~ Incheon ~ Bongdam requires 6 lanes, the section of Ilsan ~ Sudong ~ Hwado ~ Gonjiam ~ Osan and Osan ~ Yongin require 4 lanes. Table shows the best alternative in each area including belief explanation for the best line and required lanes.

Based on current private expressway[government have helped of 30 ~ 40% of total project cost, and the tolls of private expressways are double of Korea Highway Corporation(KHC)], the section of Bongdam ~ Incheon can be pushed as private expressway.

Also, if toll is double of Korea Highway Corporation(KHC) and government help of 40% of total project cost, FIRR(financial internal rate of return) approaches expectation rate of return(9.2%) for Inchun ~ Ilsan. So, in case that construction cost is decreased in an effort and etc, it's possible that Inchun ~ Ilsan can have a chance for a private expressway. Other section exclude above 2 section(Ilsan ~ Incheon ~ Bongdam) don't have economical propriety as private expressway.

For Second Ring Road, it must be conducted in the future for more detail analysis to consider changeful environment such as relationship with N. Korea and shifting of population in metro area, because the road analysis is very liable to variation.

If Second Ring Road in metropolitan area is conducted, Results are prospected that reducing the time is 8,200 million dollars, reducing the cost of operation is 1,300 million dollars and decreasing of traffic accident is 700 million dollars. Also, it is analyzed that required investment cost of Second Ring Road in metropolitan area is 5,300 million dollars, production induction effect is 12,100 million dollars and employment induction effect is 81,000 persons.
This is a pre-feasibility study on the feeder road, 9.76km in length, to transport freights from new Pohang-Yeongil Port which will be opened in 2008. This study deals with the possibility of new port opening relation with this road. Moreover, this study reviews some critical issues including the plan on the Kigye-new port expressway which is drew along this road, and the possibilities of private investment on this road, and efficient number of lanes of this road.

<Figure 1> Site Map

note: study route(red line), Kigye-new port expressway(upper blue line) new port(blue coloured rectangle on the sea)
During the study, several meetings were held between research team and civil staffs of Pohang city to arrange the alternative roads besides this road. After field study and discussions with civil servants, this road finally was selected as the most suitable route, and analysed. Because the current local road(#20) connecting new port site and city center is narrow and dangerous with sharp curves and bad road alignment, which will make large container vehicles move hard. Moreover, the local road capacity cannot afford to the freight traffic volumes occurred in the future.

Pohang city with about 512,000 population is located on the eastern part of nation. The city is famous of world class steel company POSCO. A new port at Youngil bay where is northern part of the city was assigned at 1995 by the Basic Plan for Ports made by the Ministry of Maritime Affairs and Fisheries. The new port aimed to strengthen the relationship between Pohang and Daegu where is within 70km long and with 3 million population. Daegu is major product place of textile in the nation.

The new port is planned to set all 16 berths, among them 2 berths are constructing by the government, 4 berths are proposed to build by the private company by 2008.

This study estimated and analysed the travel demand over the project area, reviewed the technical specifications of the route, estimated construction costs, and performed economic evaluation, based on the feasibility study guideline made by KDI(korea development Institute).

Furthermore, besides the economic evaluation, comprehensive analysis using the AHP(Analytical Hierachy Process) including the regional economy impacts from this route, assessment on the regional disparity index and the possibility of financial supply on the route was performed. It was found that the cost-benefit ratio on the road in 4 lanes was 1.146, when the expressway between Kigye and new port open after 2025. The cost-benefit ratio fall under 1.00 when either the Kigye-new port expressway opens before 2020 or the road designs for over 6 lanes.

This study approved the necessity of feeder road for new Pohang-Yeongil port and contributed to promote the private investment on the new port. The private investment proposal on the new port was permitted by the governmental committee.
The major purposes of this study are 1) to explore the major determinants that affect the application of computer and internet use, and 2) to investigate the regional differences for these indicators. We utilized Korea Census 2% Sample Data, which has not been fully utilized before. The present study pays particular attention to the hierarchical structure of the data and spatial units when applying our econometrics model to our empirical settings. The present study applies a multi-level binary and multinomial logit model that can incorporate diverse spatial heterogeneities as well as individual differences.

While Korea is regarded as one of leading countries in the world with regard to information technologies, a social problem of digital divide exists between ‘information haves’ and ‘information have-nots’. This is particularly so, since diverse recent evidences indicate that the poor are less likely to own computers and have internet access at home than are the rich. Diverse recent studies have also showed that this digital divide also exists among diverse groups such as gender, age, occupation, household types, etc.

There is ample reason to be concerned about the digital divide. Not only have the disparities within major segments of the population in Korea been sustained and even widened as the internet has spread, but there is also a wide gulf in access regionally that shows no signs of diminishing in the near term. Perhaps more important, the efforts to address this divide carry with them the possibility of exacerbating the already visible disparities in use.

Poor and less educated families and their children have less access to a range of resources in society. Thus it is not surprising to discover that the same pattern applies
in the case of the emerging digital infrastructure represented in home, school, and workplace computers connected to the internet. Although the basic disparities in access are not surprising, what is surprising, as we found in this study, is the sustained disparities of computer and internet usage by local autonomies. Indeed, there has been sustained attention to the digital divide in terms of basic access to the computer and internet, and the attention shows some improvement in computer use but no signs of diminishing in the disparities of internet access. We have used the growing interest in the disparities in access to computers and the internet associated with social and economic conditions focusing particularly on local levels.

We found that the most important determinants of the digital divide are age and education. The likelihood of using computer and internet access is four times higher in 15-24 age group than in aged 55 or more. The chance of access and use of computer and internet is much higher for the more educated than the less educated. Not surprisingly, as was shown in the present study, the presence of the younger age group and more educated people decides whether or not a local autonomy has a low level of information technologies in terms of computer and internet use.

The present study also found that there are big differences among regions in the applications of computer and internet use. The present study showed that the most serious problem left to worry the digital divide proponents: the lack of a conduit or pipe into the home through which the information have not's could access the internet in rural regions. This is also true for sub-districts in large metropolitan cities like Seoul, etc. This is a legitimate concern, we believe, because the size of the pipe will actually determine how fast a consumer in rural and less favored urban regions can access the internet or whether access will be available at all. Based on the findings of this study, the present study concludes with introducing several policy implications and future studies for diminishing the digital divide in Korea.
KRIHS has researched an evaluation model for the road and railway infrastructure investment from the year of 2000. The model has been developed as a comprehensive and mathematical evaluation model, which has following capabilities.

Firstly, the model can analyze the regional economic effects by means of Multi-Regional Variable Input-Output (MRVIO) Model. It considers the changes of accessibilities of each region after the transportation infrastructures investments such as national expressway and high speed rail construction. The model is also able to consider the supply (government) and demand sides simultaneously for making optimal decisions of transportation infrastructure investment using the bi-level programming optimization module. Finally, It has GUI (Graphical User Interface) prototype software for the usage and application of the model by the common users. The software also provides basic frameworks and future direction for developing professional evaluation tools for government decision makers.

In 2004, KRIHS has improved the model in order to use it as a reliable investment evaluation tool. The model adopts newly updated input data including national O/D table by Ministry of Construction and Transportation and MRIO table based on the year of 2000. There also were significant changes of key parameters in the logit model of modal split procedure based on the field survey results. Furthermore, the study extends its analytic capability to the link-based level in road networks. Thus, the model can carry out quantitative and comparative analysis on various traffic corridors and link construction scenarios in order to find optimal alternatives which minimize the total social cost under
budget constraints.

This year's study also presents the regional effects of recently opened Kyungbu high speed railway, KTX using the newly upgraded model. The total induced production effect is estimated as 482 billion won and its major beneficial regions are Seoul and Daegu metropolitan areas that have KTX main stations. The future research should be concentrated on the verification of the model using more detailed empirical data and the reliability test with various alternatives and sensitive analysis. The realistic modal split modeling among the various transport modes including roadway, railway and airlines is also needed.

With the continuous efforts for upgrading and validating the model, it is highly expected that the model will provide basic analytic tool for the evaluation of macroscopic national physical plans such as national highway and railway system development plan and national arterial transportation networks development plan etc.

Roads and the Environment
도로와 환경영향 연구
Young-Tae Lim, Il-Ho Chung, Sun-Hee Kim, Man-Gee Min, Bu-Yong Shin, Jeong-Soi Kim, Eun-Suk Kim, Jae-Cheol Suh, Jin-Seok Choi

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Roads, as key national infrastructures, have historically played an essential role in the economic, social and cultural development. Roads play a leading role in economic growth even in modern times of advanced civilization. Because of the convenience, mobility and accessibility offered by road transport, roads are more important transportation infrastructures and are used to transport 90% of the goods in Korea. In spite of such
importance and positive effects of road, it makes environment damaged such as landscape
deterioration made by road construction and air pollution and noise caused from cars on
roads. This means that more efforts are needed to find out some alternative ways of
reducing such environmental deteriorations derived from the usage and construction of
roads.

The purpose of this study, based on the aforementioned study background, is to
identify the tasks and strategies to build up the eco-friendly road system that aims to
minimize environmental damage derived from road construction on natural and social
ecologic system. To pursue the study purpose, one case study was carried out to the area
of mountain Jiri in order to identify the problems of road planning on reserved
mountainous area and to grasp the current situation on environmental deterioration made
by provincial roads constructed around Mt. Jiri.

Major research findings are as follows. First, it was found from interview survey that
the road planning around Mt. Jiri did not carefully consider the damages on environment
in the context of social and ecological sustainability. The survey result implies that more
efforts are needed to take care of reducing environmental impacts on our surroundings
in designing and planning of road construction. Second, for the sake of rehabilitating the
ecosystem damaged by provincial road passing through Mt. Jiri, it is urgent to provide
eco-friendly facilities, such as eco-bridge to help animals pass over. It is also
recommended that the facilities should be provided in the stage of road design considering
environmental sustainability. Third, it was found from the evaluation of road investment
policy that the current road policy seems to bluster up an abuse of providing redundant
road constructions, especially due to the transportation policy to meet road travel demand
rapidly increased. As an alternative way of improving such road investment policy, it is
recommended to introduce a system allowing public involvement that permits to suggest
an opinion of pros and cons for a road construction. Finally, the importance of
environment impact analysis is emphasized to reduce environmental deterioration. And the
post environmental management system should be introduced to prevent aggravation of
additional damages on our environment to be shared with next generations.
Construction Industry Database System has been developed since 1999 till 2004 to enhance the industry information management ability of the government and obtain the clarity of construction industry.

Construction Industry Database System is a comprehensive and unique information system, which manages, integrates, and analyzes construction company and works related information. It consists of six different sub systems respectively, which are KISCON(knowledge information system of construction industry), GOV(government intranet system), CIS(construction administration system), CWS(construction works information system), PCM(pronouncement system of construction management company), EIS(earth information sharing system).

This study sets two strategic directions for the revitalization of logistics hub function
of FEZ (Free Economic Zone): to attract more FDI (Foreign Direct Investment) and to enhance logistics function of FEZ.

The following strategies settle on to promote the former direction
- To offer global standard service.
- To fortify an incentive system.
- To set up a comfortable settlement environment.

The following strategies settle on to promote the latter directions
- To foster logistics innovation cluster.
- To offer specific service in each FEZ.
- To develop transportation infrastructure to hinterland.
- To find a solution to the problem of FEZ.

There has been increasing competition among countries to be a logistics hub of Northeast Asia. In this circumstance, it is important to consider the relation with China in the point of competition & cooperation.

Main strategies in conflicting circumstance are as follows. First, it is necessary to reform the tax system. The application of prime tax rate and grant of incentive should be applied to tax system: the container tax is an obstacle to strengthen the competitiveness of FEZ over international market. It is necessary to introduce the flexible system of industrial locations to FEZ as well.

Second, it is necessary to build up cooperative system with private, public and academic partnership. For one thing is to bring forth a contingent of experts capable of leading research works of logistics. What is more is to foster safe labour conditions by close cooperation between private and public sections. One final point is to promote the given conditions of FDI by modernization of logistics industry.

Third, pleasant life and business circumstances should be fostered. There is necessity for attracting foreign manpower and talented people not only making convenient life space such as education, health care and leisure but also using English as public languages.
Forth, innovative logistics clusters should be developed in FEZ. The logistics industry, composed of various components, is needed to form the cluster. This cluster has to be located not only the existing logistics facilities such as port, airport but also university, institute and finance that play an innovative role. A value added logistics center and an information center are also needed and a grand location has to be secured.

Fifth, the specific logistics service should be supplied at each FEZ. Three FEZ(Inchon, Gwangyang, Busan-Jinhae) should horizontally share their logistics function to protect functional lost in view point of nation.

Sixth, from survey analysis, foreign investors have high tendency to locate their industry in the region that is close to a big market and well distinguished infra such as road, airport and rail. The rear connecting transportation network should be arranged to expand market and improve accessibility.

Seventh, the operation of FEZA(Free Economic Zone Authority) is peculiarly reformed to execute the above six strategies offered in this study. The national capability is also efficiently used by means of choice and concentration.

Comparing with various conditions, Gwangyang-FEZ is inferior to the Inchon-FEZ. Because the Gwangyang-FEZ is not well known in the world yet. It is necessary to establish cooperative marketing strategy between central and local government. The independent effort and functional differentiation are needed between the Busan-Jinhae-FEZ and Gwangyang-FEZ. To accomplish this purpose, this study suggests the functionally divided scheme according to freight management region and rear region. To take an example, the Busan-Jinhae-FEZ take exclusive logistics service to Kyusu in Japan and the Gwangyang-FEZ take exclusive logistics service for China and Southeast Asia.

As a result, the domestic FEZ, now having more disadvantage than advantage, is evaluated in taking a low competitive power. But, there are more opportunity factors than threats in the future. If these factors are well set in a good condition, It is possible to build up a Northeast Asia logistics hub at domestic FEZ.
The purpose of the study is to newly define the role of the construction surety and explore the strategies to strengthen its role making the construction surety more efficient and advanced. The study covered the construction surety system and institutions, and other related fields. The study was executed through the literature review, interviews, questionnaire, and collected the various opinions by holding a forum and research meetings. While the former studies had mainly focused on the specific surety institutions and systems so far, this study investigated the environmental change of the construction economy by the transition towards market mechanism and the coincident strategies to strengthen the function of the construction surety. Especially the study focused on the confirmation system of maximum surety amount.

The study consists of six chapters. Chapter 1 introduces the background, the purpose, the scope and methodologies, and the differences from the former studies of the study. In Chapter 2, the whole size and the characteristics of the surety and insurance market were introduced, and the current situation of the domestic surety market was investigated.

Chapter 3 presented the prospect of the change of the surety market condition. Among the enormous trends towards market mechanism, the role and the function of the construction surety are prospected to be more important. In Chapter 4, the issues and the problems to strengthen the role of the construction surety are discussed within the framework of system, market, and the surety regulations. Chapter 5 proposed the strategies to strengthen the role of the construction surety. In Chapter 6, the conclusion, policy recommendations, and limitations of the study are mentioned.
The strategies to establish the new roles of the construction surety are as follows.

First, construction surety should improve the credibility and support the smooth economic activities by offering the credits to the construction companies and the mortgages to the creditors. Second, construction surety should function as a co-ordinator of construction market to control the unhealthy and unqualified companies and perform the screening and evaluation process. Third, construction surety should function as a protection device for the construction demanders by guaranteeing the completion of construction project satisfying to contract terms and price. To perform these roles for the construction surety, the generalization and improvement of the certificate system of maximum surety amount are required. In addition, establishment of project performance surety system, stepwise openness of construction surety market and fair competition base provision, and competitiveness of financial cooperatives as surety institutes are necessary.

Under the current system, the proper control device to regulate the unhealthy and unqualified construction companies which operate as paper companies in the industry does not exist. The certificate system of maximum surety amount is evaluated as an alternative to secure the market soundness by expelling the unqualified companies out of the market.

Lowest bidding system which has the obligation of the surety certificate for the project performance has expanded from the pre-qualified projects more than 100 billion won to the pre-qualified projects more than 50 billion won since Dec. 2003. Project performance surety system should be expanded to abolish the joint liability system on guarantee. Compensation of the real loss also should be guaranteed. Lastly, improvement of contract practices and management ability of procurement institutions are required.

Considering the surrounding environment of surety market, market competition should be induced from the current monopolistic and oligopolistic market structure to develop towards the advanced construction surety. When the competition system in the surety market through the plural surety institution system is introduced, surety fee and surety limit may be determined by the market mechanism. The structure of the construction industry is expected to improve through the strengthened credit evaluation function; better surety service will be offered to financially superior companies and unqualified companies.
will be expelled. Legal and regulatory arrangement is prerequisite for the plural surety institution system. It is appropriate to maintain the current market structure until the overall environment is improved. In the short term, the system should be improved so that the financial cooperatives which deal with the construction surety may compete fairly, and the unfair competition factor between the Seoul Surety Insurance Company and the financial cooperatives should be removed. Laws and systems should be arranged so that insurance companies may deal with the construction surety in the intermediate term. In the long term, the construction surety market should be open to all general financial institutes.

Main problems which the financial cooperatives have are their unbalanced profit structure, inappropriate surety fee rate, and the poor expertise. To secure the competitiveness, the surety undertaking ability through strengthening the company evaluation ability should be improved. Establishing risk diversification system, strict management of guaranteed project, reasonable assessment of surety fee and limits are required. In addition, the strategies to improve financial structure like the separate operation, establishing the subsidiary surety company or the common surety institution invested from three financial cooperatives should be reviewed.

Korea has a high proportion of Social Overhead Capital(SOC) investment in the
national economy among OECD countries.

If the investment in SOC continues to expand with the current tendency, Korea is expected to belong to the hither group among OECD countries by 2020 in terms of the facility level of SOC. For the efficient investment in SOC, the investment in the improvement and maintenance of SOC facilities should be expanded.

The study is the subsequent one to the last year's research on the same theme. In the first year, the study investigated the current situation of the improvement and maintenance of SOC facilities in Korea. The study also deduced the policy implications for the efficient improvement and maintenance from the foreign case studies, on the other side, the optimal level of improvement and maintenance was derived.

In the second year, the study reviewed the institutional device about improvement and maintenance of SOC facilities based on the first year's research. Strategies for the efficient improvement and maintenance of SOC facilities were suggested, after problems in budget operation were pointed out from the analysis of the real investment in the road construction and the budget operation system in U.S. was introduced. The study consists of six chapters.

In Chapter 1, the background and the purpose of the study were introduced. The purpose of the study is to explore the concrete institutional device for the efficient improvement and maintenance of SOC facilities based on the main conclusions from the last year's research on the same theme.

In Chapter 2, the investment tendencies in improvement and maintenance of SOC facilities were analyzed and prospected centering on road construction. The total amount of investment includes the expenses for expansion, improvement, and maintenance as well as new construction. The proportion of improvement and maintenance is estimated to increase to 70.8% in 2020 from the current level 58.3%. This result was based on the expectation that the proportion of improvement and maintenance increase rapidly by the investment increase to prevent the deterioration of existing road and guarantee the transportation safety.

In Chapter 3, the current situation, actual conditions, and problems in improvement
and maintenance of SOC facilities were investigated. The inefficiency in improvement and maintenance of SOC facilities occurred because the related laws and organizations of SOC facilities in Korea were dispersed by individual facilities and comprehensive and systematic management were deficient. Especially, the study revealed the problems in the provision and operation system of budget.

Chapter 4 introduced the case of U.S. In U.S., SOC facilities were regarded as capital asset and managed by the consideration of their life cycles. Projects are executed in various modes under the targets and the aims of improvement and maintenance of SOC facilities in U.S. GPRA and Capital Programming Guide were established and operated at the federal government level to efficiently execute improvement and maintenance.

In Korea, the introduction of the Capital Asset Management System will be appropriate to improve the efficiency of improvement and maintenance of SOC facilities.

In Chapter 5, the strategies to efficiently improve and maintain the SOC facilities were explored based on the actual conditions and problems and the implications from the case study about U.S. Directions about organization, budget, and system for the comprehensive arrangement for improvement and maintenance of SOC facilities were suggested, and the following detailed implementation methods were proposed for the short term and the long term.

Concludingly, The Final section proposed to enact tentatively named “the law for improving the efficiency of management of SOC facilities.”
This paper tries to serve as a tribute to establish the basic system for evaluating the government performance, which was introduced in 2003 as one of the fiscal reform in Korea. Performance Management System, leading by the Ministry of Planning and Budget(MPB), has yet to be fully established. According to MPB’s fiscal reform road map, All ministries have to establish the substantial plan in this year.

This paper largely consists of two chapters; first chapter includes the guideline for performance management system of MOCT(The Ministry of Construction and Transportation), second chapter includes the establishment of the actual objet and implementation plans.

In the first chapter, institutional improvements are suggested to the success of early settlement of the system. First of all, institutional infrastructure, such as enacting the system by the law, organizing the constitution and training the experts in performance management, have to be preceded.

In the second chapter, actual objet and implementation plans of MOCT are suggested. MOCT’s Performance Management System consists of 9 strategy goals, 44 performance objects and 144 assessed indexes. 9 strategy goals of MOCT are as follows, 1) supplying for clean water and protect against natural disaster, 2) housing construction and management for low-income class and enhancing the dwelling level, 3) enhancing national competitiveness and balanced regional development, 4) saving the distribution cost, 5) preventing from traffic accident and settling down the advanced transportation culture, 6) expanding and maintaining the convenient and high-speed road construction, 7)
maintaining the convenient and high-speed railroad construction, 8) building the hub of airports and seaports in northeast Asia, 9) advancing the construction technology and enhancing the competitiveness in construction industry.

In this study, we can expect that the research will contribute to take early root performance management system which is just initiated in Korea.

Finally, enhancing the efficient budgets and expenditures will accomplish the efficient nation resource allocation, as well as MOCT’s strategy goals.
highways.

The first work of the study is analysis of currently ongoing projects and related plans. Demand forecasting includes in forecast of major socio-economic characteristics (population, auto-ownership, GDP, etc.), network formulation for the major roads, and presentation of forecasted trip volume. To establish basic goals, role distribution among the major roads is reset.

Target projects are decided by sorting them into type of projects, such as new construction, expansion, and repair. To increase propriety, various stakeholders including advisors were participated in the study. Cost-benefit analysis is used to decide priority for investment and prepare phased plans. Evaluation variables and weighting method is decided by setting a multi-criteria evaluation model and taking advices of experts. Financing is made for the five-year plan considering available resource.

This study is expected to contribute as a mid- & long-term plan of nation-aid provincial roads. In addition, plans of other major roads which are planned and managed by the Central Government can be linked by this study.

Since the five new towns around Seoul were developed in the 1980s metropolitanization of the capital area has been fasten. Although the new-town development provided people with three-hundred thousand new homes, housing shortage
is still a problem. The central government is now planning another five new-town
development in the area. With those new developments population of the area is expected
to be increased from twenty-two millions in 2002 to twenty-six millions in 2023.

Although those new developments contributed to supply homes and to increase degree
of residential amenity, transportation problem becomes major issue of the area. Because
of limited self-sufficiency of the new towns half of the commuters travel to Seoul. In
terms of transportation mode, also half of the commuters who travel to Seoul use private
cars instead of public transportation.

To solve the metropolitan transportation problems the central government set up a new
philosophy: “transportation plan first, then land development.” In 1997, a Special Law for
Metropolitan Transportation Management was passed, and a guide of Metropolitan
Transportation Counterplan for Large-Scale Developments was formulated in 2001.
During last three years, various problems of the guide were introduced especially about
applicability of some part of the guide.

Purpose of the study is to analyze problems which have been introduced in the process
of implementation, and to suggest alternatives. Spatial range of the study includes in the
six metropolitan areas of the country. Problem analysis and alternative suggestion are
carried by monitoring of passed cases and interviews with stakeholders. Results of the
study are expected to be used not only for revision of the guide but also for developing
new policies in metropolitan transportation.

The first problem of the counterplan is related to target development. Although types
of developments are various, such as residential or industrial, target development is
decided by only two requirements: land size with more than one-million square meter or
population size with more than twenty thousand. Second problem is about spatial range
of the counterplan. Considering real-effect areas of the previous cases, the guide keeps
too wider regulation. Third, process of making a counterplan requires lots of time and
effort to negotiate with various stakeholders. In addition to those major problems, many
kinds of other problems are introduced from governments and developers, such as
problems in monitoring and financing systems.
For the problems of target development, there should be more flexible guide considering difference of trip generation among different types of developments. In terms of metropolitan transportation, residential development should be more carefully directed than other types of developments. Range of analysis can be withdraw considering real effect of the previous case, and therefore time-consuming negotiation process with indirectly effected areas can be minimized. To minimize the problem of shortage of implementation period each counterplan should be fixed sooner than current regulation. By the time of fixing land-use master plan transportation plan should be co-considered. To supply transportation facilities by the time of opening development sites, monitoring system of the counterplan should be more strengthened.
comprises four main contents: statistics of road facilities and environment in change and variety, the goal of road maintenance and the index of road development, robustic direction for the environment-friendly road maintenance, and investment plan including revenue sources.

Statistics of road facilities and environment in change and variety; this part includes statistics and problems for road facilities, traffic volumes, and progressive state for the plan. In addition, it is mentioned to future basic policies for road maintenance through consideration for changes on the inside and outside of the country, reviews of related plans and literatures, and expert council.

The goal of road maintenance and the indexes of road development; this field embraces the detail goal and propellent strategy which can cope with the environmental changes, and provide a solution for current problem on the road. The indexes of road development such as traffic demands and scope of revenue sources are mentioned by considering total vehicle travel distance, and transition of road development in the foreign countries.

Robustic direction for the environment-friendly road maintenance; this chapter comprehends the suggestion about readjustment for the master plan of public roads, which is the management direction for national expressway, highway, and aided provincial road. Also, a master scheme for environment-friendly road construction on each step including plan, design, construction, and maintenance for the roads is included in.

Investment plan including revenue sources; this section includes an analysis for required resources to carry out readjustment for the master plan and for possible scope of resources at present. Also the section shows deficits to do the plan, and how to appropriate a sum to other methods such as derivation of private fund to public projects.

The research can be made a good use of readjustment for the master plan of public road as well as direction of mid-term road polices, establishment for national land development and balancing development plan in the county. In addition, the research can be used in sub-road planing such as provincial roads.

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By opening the High Speed Rail at 1st April 2004 in Korea, the spatial distance between regional cities has been shortened owing to improved accessibility by the KTX(Korea Train eXpress). At the time of opening, some concerns such as regional economies' shrinkage, population movement into Seoul metropolitan areas were occurred. Therefore it was required to survey where the concerns were true or not. The aims of the study were to survey on the socio-economic characteristics of travellers who used the KTX, to file some related data as well as to find out economic impacts over the regional cities by the HSR. The surveys were carried out at the time of one month after HSR inauguration over the regional cities where the KTX was serviced.

There were three kinds of surveys; characteristics on the travellers who used the KTX, shopping activities at regional cities where the KTX was serviced, lodging house movement at university cities such as Cheonan and Daejeon cities.

The main findings are as follows: According to the survey on the socio-economic characteristics of about 1,166 passengers who used the KTX, the best reason for using the KTX was ‘cutting movement time’ which shared about 79.2% among the respondents. Particularly, about 11% of respondents were used it owing to their curiosity about the High Speed Rail and KTX.

Although major travel purpose was shared 45% as “returning home”, however “personnel business trip” was 55% when “returning home” converted into the original purpose. Major access transport modes were taxi(30.7%) and subway(29.3%), but car(17.5%) and bus(16.6%) also shared high portion.
Shopping trip using the KTX was remarkably low as 2%, but mixed trip purposes rose to 15.4% among the respondents. Tour and leisure trips were 8.5%.

Although business trip purpose was shared as 27.6%, the respondents were satisfied with the time availability and rise of daily trip possibility because of the travel time cutting.

Another survey carried out to 400 shoppers at 4 cities where the KTX was serviced revealed that no remarkable difference on the change of shopping power or shopping area was caught after opening the KTX. The major reason why no difference was caught was the shortage of shopping power owing to nationwide economic recession. However most merchants thought that the KTX would bring negative effects(33.3%) rather than positive effects(19.3%) in regional economy afterwards. Although no remarkable difference was caught in the field of shopping service, negative impacts from opening the HSR were concerned among the respondents. Especially high fashion shops and import shops of regional cities would be affected seriously. However, tourism industry and local speciality industries would be flourished owing to influx of tourists from Seoul metropolitan area.

The last survey one was on the situations of lodging house in 2 cities where lots of universities and colleges are located on. In this survey no difference was revealed in lodging rates, number of residents of lodging house. Although there were some possibilities to commute universities and colleges using the KTX from Seoul, commuting and travel time costs using the KTX were not cheap as much as the lodging house rate. Therefore commuting students were few and the situations of the lodging house had no difference at all.
Land and Housing
KRIHS and College of Southeast Land Management, Zhejiang University in Hangzhou have conducted a joint research since 2001. This year in October, we held the joint workshop on land policies of Korea and China focusing on “Coordinating the Public and Private Interests in Land”. This is the edited proceeding of the October workshop; eight papers are filed.

Chapter 1 explains the historical evolution of management policy and organizations dealing with the state-owned land in Korea. It also contains the managerial status and the annual managerial plan for the state-owned land.

Chapter 2 begins with the description of land management law in China, then it explains what the public project for land expropriation is, how the compensation is made for expropriation, how the real estate(particularly, buildings) in urban areas is cleared away, and how the residents are removed. It also describes the allocation plan of land for public uses, and financial arrangement for the purchase of land for public uses.

Chapter 3 describes the historical evolution of the system for land expropriation and compensation, explains the so-called new integrated law of land expropriation and compensation in 2002, and shows the legal process and methods for purchasing land for public uses in Korea.

Chapter 4 analyzes the land expropriation and compensation system in China. Particularly, it describes the systematic structure and legal contents of real estate expropriation, clearing away of building and removal of residents. Then it indicates the problems thereof and suggests policy direction therefor.
Chapter 5 deals with the conflicts of public and private interests by using the case of land for urban planning facilities in Korea. That land has been designated for urban planning facilities about 20 years ago and thus the use of land is prohibited. But until now, the land is not used for urban planning facilities; Complaints from land owner follows. The paper indicates the problem thereof, and suggests the policy directions.

Chapter 6 shows the appraisal prices of agrarian land in China, which is under expropriation and compensation. It evaluates the current methods of appraisal for compensation prices, conducts an empirical survey on the reasonableness between the prices and annual profits of agrarian land, indicates the problem of current compensation schemes, and suggests policy improvements.

Chapter 7 focuses on the schemes for managing the non-urban areas development by using impact fees system in Korea. It describes the background of the introduction of impact fees system in 2002, the problems, and policy suggestions.

Chapter 8 deals with the real estate taxation system in China. It evaluates the merits and demerits of the real estate tax, and suggest policy directions for the restructuring of the system and for the fair appraisal of the real estate for the taxes.

The Land Suitability Assessment System (LSAS) was introduced to provide land use classification criteria for Urban Management Plan. It was introduced by the 「Act on
Planning and Utilization of the National Territory in order to prevent unplanned development of the nation. It classifies land use types into 5 grades according to soil, location, and usability of the land. Most of the lands are assessed as first and second grade, tend to be planned as conservation area, while the rest of lands are assessed as fourth and fifth planned as development area.

The study consists of six chapters. Outlines for each chapter are explained below. Chapter 1 shows backgrounds, methods, and goals of the research. This study is to apply LSAS on the land of Namhae-Gun as a model area. It has two purposes. The first one is to assess suitability of the land in the Namhae-Gun to provide information for the Namhae-Gun Management Plan. Based on the assessment result, the Gun Management Plan will be made, which breaks down the Management Zone into three sub-zones; Planned Development Zone, Agricultural Management Zone, and Conservation Management Zone. Even though the main target area of LSA is the Management Zone, the study also assesses land suitability of Green Zone, Agricultural Zone, Environmental Zone of Namhae.

And the second purpose is to analyze problems in applying the Land Suitability Assessment System, to seek solutions for the existing problems. These problems and solutions are analyzed in this project which are presented in the book 「Policy Alternatives for Land Suitability Assessment System」, published in 2003 in KRIHS.

Chapter 2 analyzes the physical characteristics, various plans related to Namhae, land use and ecological conditions of Namhae. Namhae island is located on the southern part of Korean peninsula. The area of Namhae island is 356.4km², composed of 1 Eup and 9 Myuns. Namhae has many beautiful scenic resources, therefore it has been planned as a tourist area in the 4th National Land Plan and the Comprehensive Kyung Nam Development Plan.

Chapter 3 establishes attributes & maps DB of Namhae. In these DB, slope, altitude, land use, accessibility and other characteristics of each land, as well as cadastral maps, land shape maps, various thematic maps are included.

Chapter 4 describes factors and standards of LSA. Factors such as slope, altitude, etc,
as presented in table below are used in assessing the suitability of the land. Assessment standards for these factors are deducted based on the data of Namhae.

<Table 1> LSA Factors

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<td>slope, altitude</td>
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<td>regional(neighbouring land use)</td>
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<td>factors</td>
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<td>urban land ratio, zoning change</td>
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<td>locational factors</td>
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<td>distance to public facilities</td>
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<td>ratio of prime farm land,</td>
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<td></td>
<td>area, ratio of conservation area</td>
</tr>
<tr>
<td></td>
<td>locational factors</td>
</tr>
<tr>
<td></td>
<td>distance to prime farm land,</td>
</tr>
<tr>
<td></td>
<td>distance to conservation area</td>
</tr>
</tbody>
</table>

<Table 2> LSA Results of Management Zone of Namhae-Gun

<table>
<thead>
<tr>
<th>suitability class</th>
<th>km²</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>prior conservation grade</td>
<td>14.9</td>
<td>18.1</td>
</tr>
<tr>
<td>grade 1</td>
<td>3.1</td>
<td>3.8</td>
</tr>
<tr>
<td>grade 2</td>
<td>14.6</td>
<td>17.8</td>
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<tr>
<td>grade 3</td>
<td>27.0</td>
<td>32.9</td>
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<tr>
<td>grade 4</td>
<td>7.5</td>
<td>9.1</td>
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<tr>
<td>prior development grade</td>
<td>12.4</td>
<td>15.1</td>
</tr>
<tr>
<td>grade 5</td>
<td>2.6</td>
<td>3.2</td>
</tr>
<tr>
<td>total</td>
<td>82.1</td>
<td>100.0</td>
</tr>
</tbody>
</table>
Chapter 5 presents the land suitability results for Management Zone of Namhae-Gun. The grade 1 and 2, which have strong conservation necessity, are 32.6km²(39.7%), while the grade 4 and 5 is 23km², which cover 27.4% of the Management Zone of Namhae-Gun. Finally, the LSA results of Green zone, Agricultural Zone, Environmental Protection Zone are presented in chapter 6.

### IV - 3

**Policy Directions for Improving the Distribution System and Management Scheme of Public Rental Housing**

공공임대주택 배분체계 및 관리제도 개선방안 연구

Geun-Yong Kim, Hee-Nam Jung, Pan-Ki Cho, Chun-Gyu Park

RR 2004-26 · December 2004 · 168 pages · Korean

In 2003, the new government established the plan for supplying 1.5 million units for public rental or social housing by the year of 2012 in order to obtain the low income groups' housing security. The plan will help raise the share of public rental housing stock from 2.4% to 15% of the total housing units.

We recognize that the increase of public rental housing itself is very important, considering the Korean housing market situations such as the shortage of the number of housing units, the expensiveness of housing prices, and speculation in housing trades. On the other, we believe the efficiency of implementing the public rental housing policy is also very important in order to obtain the efficient allocation of resources.

The study aims to improve the public rental housing schemes in Korea, both for fairly distributing public rental housing and also efficiently managing them. For the purpose, the study tries to re-establish the target groups, distribution and management plans of public rental housing schemes; to link the supply of public rental housing and other housing...
subsidy programs for low income groups; and to upgrade the public rental housing schemes, reflecting the changes of the governance in public rental housing market and thus particularly encouraging the participation of public rental housing rentees in managing “their” rental housing for “themselves”.

It consists of six chapters. Following the Introduction, Chapter 2 reviews the present situations of public rental housing market and policies. Chapter 3 shows the results of empirical surveys of both macro and micro levels of public rental housing market, including households' characteristics residing in public rental housing, the physical conditions of public rental housing, rentes' income and costs for public rental housing, and rentee' attitude for distribution and management schemes of public rental housing. Chapter 4 defines the problems in allocating and managing public rental housing. And Chapter 5 conducts an international comparative study on public rental housing systems. It includes Japan, England, and U.S.A.

Chapter 6 suggests the policy directions for improving the public rental housing schemes, both for fairly distributing public rental housing and also efficiently managing them. It is summarized as follows; To improve the fairness in distributing public rental housing, the criteria for selecting the target group should be articulated; the mix of supplying types (i.e., building and renting method, buying and renting method, and rents subsiding method) is recommended; the social mix is also recommended by applying the mix of housing sites of selling and renting houses; and the policy mix for low income groups' housing subsidy programs is recommended.

To improve the efficiency in managing public rental housing, the criteria for moving out the rentees need to be articulated, reflecting the changes of their incomes; the measures for encouraging the participation of rentes in managing public rental housing are suggested; and the long-term plans for repairing the physical conditions of public rental housing are to be prepared.

Chapter 7 is a conclusion that summarizes the findings and policy implications, and indicates limitations of the research and tasks for the future research.
Recently the government is promoting the revision of the Agricultural Land Act, which mainly contains the deregulation of agricultural land for strengthening agricultural competitiveness and encouraging rural vitalities. As a result of deregulation of agricultural land, the agricultural land acquisition by urban capital will be increased and various development projects in rural areas will be revitalized. However, it is also worried that the agricultural land speculation will be accompanied with it. In this situation, is the existing land speculation control system well equipped to cope with agricultural land speculation? The study starts from such a question.

The chapter 1 includes the purpose, scope and methodology of the study with the background mentioned above. This study aims to grasp the weak point of the existing land speculation control system and to provide countermeasures that enhance effectiveness of the system.

In the chapter 2, changes in regulation of agricultural land till now and main contents of deregulation by revision of the Agricultural Land Act in this time are reviewed. And effects that the deregulation of agricultural land have exerted on the agricultural land market and their policy implications are analyzed.

As a result, it was revealed that agricultural land speculation could be mainly occurred in management areas of large cities and its neighboring region. Therefore a policy tool which is limitedly applicable to speculative regions and regulates selectively speculative land transactions is desirable. Moreover, the land acquisition for the purpose of farming for pleasure by non-residents should not be considered as speculation, because it is
corresponding to the policy to induce urban capital to rural areas.

In the chapter 3, actual conditions of agricultural land speculation performed in a land market are analyzed from a microscopic viewpoint. First, the scope of agricultural land speculation is limited to land transaction performed by illegal activities or evasions of the law in terms of the operational definition to conception of agricultural land speculation. Then, the existing regulation system for land transaction is reviewed.

Next, results of investigation into land speculation by the Ministry of Construction and Transportation, and the National Tax Service recently are analyzed. So the type and skill of speculative activities which participants in transaction committed are analyzed according to speculation process. In the type of speculation, there are a doubled contract document, disguised donation, disguised moving-in, resale without registration, nominal trust and violation of land use obligation. These types of speculation are committed complicatedly by conspiracy and abetting among participants in transaction, who are sellers, buyers and brokers, according to every stage of concluding a contract, transferring a name of real estate registration, and using a land.

In the chapter 4, institutional devices to suppress the speculative activity are reviewed, and their weak points are analyzed. Present institutional devices to suppress the speculative activity commonly have severe penal clauses like a penal servitude and monetary penalty. Nevertheless, the speculative activity is still occurred. The reason lies in that these devices have a weak point unable to expose violations. The result of a survey for experts related to land speculation shows much the same as opinion mentioned above. In addition, it is proved to be weak points that the manpower required for the investigation of actual condition on land use is in short and the linkage among these investigations is insufficient.

In the chapter 5, policy improvements to reinforce weakness of devices to suppress the speculative activity and to enhance their effectiveness are suggested on the basis of the discussion made till now. The basic direction for policy improvements is to set up as the transparency of land transaction, the rationalization of regulation measures, and efficiency of a monitoring system. And several devices for policy improvement are
suggested as following.

First, the real price of transaction should be grasped. The concrete devices have been discussed among experts for this are examined as following: 1) the entry of real price of transaction in registration, 2) notarization of land transaction, 3) presentation of certificate for transaction contents issued by banking organ, 4) intermediating of land transaction by banking organ, 5) obligation of an escrow system, 6) imposition of transfer income tax in terms of acquisition price. Among these, the most effective device can be found out through the imposition of transfer income tax in terms of acquisition price.

Also the obligation of broker's declaration to real price of transaction and the input to a real estate transaction system, both of which are being promoted by the government, are reviewed. The former is expected to produce effective result because details of transaction are well known to brokers except transactors themselves. But it needs to be accompanied by thoroughgoing supervision and severe penal clauses. The latter is difficult to set up an objective standard judging whether the price of transaction is appropriate or not. Moreover, its legal basis is vague, and it is also unclear how it can link up with obligation of broker's declaration to real price of transaction that is already on legislation.

Second, the standard for land transaction permit should be rationalized. The concrete devices for this are examined as following: 1) maintenance of the present size of acquiring a permission to rural areas; 2) improvement of the standard to set the size of acquiring a permission; 3) rationalization of the residence requisite; and d) legislation of restriction on resale.

Third, the efficiency of a monitoring system should be enhanced. The concrete devices for this are examined as following: 1) linkage between investigations of actual conditions on land use; and 2) systematization of investigation on land speculation. It is necessary to utilize the result of a land characteristic survey as the first data of investigation of actual conditions on land. Investigations of land speculation being separately executed by the Ministry of Construction and Transportation, the National Tax Service, and prosecutory authorities are also needed to be combined. And then, the combined investigation should be executed regularly and permanently.
Finally, in the chapter 6, the conclusion of this study is presented and the limitation not being dealt with far enough in the study is revealed.

Recently, housing shortage problem is almost alleviated in the aggregated level due to the massive housing units supply policy in Korea. As a result, the ratio of the number of housing units over the number of households appears 101.2% in 2003. However, the households of substandard housing reaches 23.4% as of 2000, where the minimum housing standard is considered as for housing area, housing facilities, and number of rooms. Low income households tend to reside in the inferior housing units, but they are paying comparatively high ratio of housing expenses which is apparently big burden for them. Thus, the gap in housing conditions and housing burdens between the high income family and the low income family is widening.

The purpose of this study is to build more systematic housing allowances scheme and to find the ways for implementing it effectively in order to improve the housing conditions of the low income households and to mitigate their burden of housing costs and to enhance the efficiency and the equality of housing support system.

In chapter 2, the situations of the low income households’ housing conditions are presented and the recent movements of rental housing market are described. At the same time, the rationale for necessities of housing support, especially housing allowances is
discussed.

In chapter 3, analyses for the effectiveness and the current problems of the housing support programs (both supply side support and demand side support) are mentioned. As a result, housing programs seem to have positive effects on enhancement of the housing welfare level and the housing satisfaction of the beneficiaries. However, the housing support programs reveal some problems in the performance and the equality of the provision. When we compare the benefit and the income levels of the beneficiaries for the various housing support programs according to the income distribution of the target group, we find that the benefits are not equally distributed among various low income classes. Some classes are provided with overlapping services with different programs, while the others are never received any housing support program.

In chapter 4, the housing allowance systems of foreign nations such as England, USA, France and Netherlands are reviewed. In almost all of the countries, the aim is to ensure that rent burdens do not exceed what is considered to be a reasonable share of household income - usually defined as being in the region of 15 to 30 percent of income - which in turn defines the minimum contribution which households are expected to make out of their own resources. A second aim of housing allowances in some of these countries is to ensure that recipients can afford to occupy a minimally adequate standard of housing consumption. But all of these countries employ rent ceilings or benefit maxima to prevent over consumption of housing.

In chapter 5, a guideline is proposed to evaluate the eligibility for receiving housing allowances such as income classes, the ratios of housing costs to income, regions, household sizes, etc. by analyzing the housing burden of each household and the minimum housing cost which can meet its own minimum housing standard with ‘A survey on the actual housing conditions of rental households in 2004’, which is performed as a part of this research.

In chapter 6, on the basis of previous chapter's findings we describe who should be eligible for housing allowances, and examine the structure of the housing allowance schemes in Korea. The formula for calculating rent assistance is as follows:
\[ RA = R - \alpha Y \quad \text{if } (R - \alpha Y) > 0 \]

- \( RA \): rent assistance entitlement
- \( R \): minimum housing costs (or eligible housing costs)
- \( \alpha \): household contribution rate (20% ~ 30% of income)
- \( Y \): income

Moreover, we try to calculate the average of rent assistances according to the formula referred above and to estimate the number of recipients of rent assistances with assumptions of income classes, household contribution rate, etc.

In chapter 7, we especially emphasize the necessity for investing thoroughly and periodically the income, housing conditions, socio-economic characteristics of target households in order to practice this system effectively. In addition, we propose that this housing allowance system is desirable to be implemented step by step considering fiscal constraints. And the first target group of this rent assistance scheme should be the lowest 10th and 9th bracket of income whose ratios of their minimum housing costs to income exceed their reasonable contribution rates, but the beneficiaries of National Basic Livelihood Security system should be excluded among above groups.
have linked with each other and the vicious cycle has continued. Various policy reforms have been introduced to cut the cycle, to make land market rather stable, and so on.

Nevertheless, the situation keeps unchanged. The new government announced in February 2004 to implement land regulation reforms in order to cut the vicious cycle. The key agenda are: 1) the basic source of land problems which is the mis-match of demand and supply of urban land; 2) the basic source of the mis-match which is the heavy regulations imposed on land; and thus, 3) moving out regulations on land which is inevitable to increase(urban) land supply and to keep land prices stable.

The study aims to review those agenda; 1) whether there are mis-matches of demand and supply of urban land, 2) whether land prices will come down or at least keep stable if land regulations are moved out, and 3) whether the reform is free from other side effects.

It consists of three chapters. Chapter 1 is the introduction which explains the background of policy agenda for land regulation reforms, the status of regulation reforms announced during the last couple of months by both the central and local governments, and the purpose of this study.

Chapter 2 is the main body of this report. It reviews whether the mis-match of land demand-supply is true. By the year of 2020 the total amount of 3,722km² of urban land is expected to be required, while the total amount of 19,085km² of non-urban land is expected to be supplied for urban uses, even without another de-regulations. Thus the shortage of urban land might be too much overstated.

It also reviews, theoretically and empirically, whether de-regulations on land increase the supply of urban land and also make land prices stable. It increased the supply of urban land, but the land prices did not keep stable. It is because of the unique characteristics of land under the capitalist system. Land is one factor not only in the production market, but also in the property market. Thus when regulations are moved out, then real estate or speculative capital comes into the land market faster than industrial capital does.

It is also possible that many side effects might come out by land regulation reforms,
including more concentration of the Seoul Metropolitan Area, re-occurrence of land speculation, mal-development or frog-jumped development, and so on.

Chapter 3 suggests policy tasks in implementing land regulation reform program including some pre-requisites for successful de-regulation reforms; even if de-regulation is inevitable, the program shall be implemented through rather comprehensive approaches. The shortage of urban land is not the problem of the whole nation. It is the problem in some special areas such as around big cities. Thus, it is also required to distribute the demand of land throughout local areas. The de-regulation program should also be implemented along with enhancing the transparency and trust of land market.

IV – 7

Policy Tools for Planned Territorial Management: Implementation Status and Policy Suggestions
계획적 국토관리를 위한 정책수단의 운용실태 및 개선방안 연구
Mie-Oak Chae, Hyeong-Min Yeom, Dae-Sic Ji, Dong-Jin Shin, Hyeok-Jae Choi, Chun-Man Cho, Ha-Seung Song
RR 2004-25 · December 2004 · 244 pages · Korean

Under National Land Planning and Use Law (hereafter NLPUL), a different kinds of policy devices were introduced to achieve the goal of “Plan-based Development” for the achievement of planned national territory managements. Though the purposes of those policy devices were very idealistic, there were no actual experiences of execution, and now people acknowledge that prior preparation and validity study were insufficient, necessary for their practical executions. So, the purposes of the current study are to facilitate the earlier settlements of those newly-devised policies, and to search for short-term policy alternatives as well as long-term policy amendment issues through the
analyses of the current execution statuses of those policy devices introduced under NLPUL.

Of those newly-devised or improved existing policies, it was found that Area-wide Urban Planning, Urban Comprehensive Planning and Urban Management Planning are mostly related to so fundamental issues that they would require much longer period of thoughts and open discussions. So, the current study only introduces the contents of those devices, and roughly describes their problems and improvement directions as long-term amendment issues. Accordingly, the current study intentionally narrowed its scope within such short-term improvement-necessary policies as 2nd-Type District Unit Planning, Land Suitability Assessment, Development Behaviors Permit, and Forced Provision of Public Facilities from Private Sector, which are now actively put into practice or what are not fully executed but need short-term improvements for its smooth rolling. Likewise, the current study finally proposed both the short-term improvements and the long-term amendment directions through policy analyses, interviews, GIS analyses, on-line complaints analyses, a series of discussion forums and workshops, and structured questionnaires, etc.

In principle, the ultimate goal of NLPUL is not to strengthen public regulations for planned national territorial managements. Instead, it is to distinguish between lands available for developments and others for conservation, so that required procedures shall become more available for developments on lands available for developments, while more strict preservation shall be possible on lands for conservation than ever. For those purposes, such policy devices as Urban Comprehensive Planning, Urban Management Planning, 2nd-type District Unit Planning, Land Suitability Assessment, Forced Provision of Public Facilities from Private Sector, etc., were introduced. But, insufficient prior investigation on detailed policy execution standards, inter-relations among different policy devices and connections to existing ones resulted in the situation that those policies are seemingly not for the goal of planned national territorial managements but rather for the reinforcement of existing complicated regulatory procedures and costs following. Therefore, the current study sets the basic directions for the improvement of those policy
devices, required for their earlier settlements as the following:

First, supplement for insufficient contents in standards and guidelines through the investigation of related laws or regulations.

Second, simplify duplicate contents and procedures through the consideration of the regulatory contents, procedures of related laws or regulations, and inter-relations among them.

Third, enhance the efficiency of inter-related public administrative procedures through the materialization of operation guidelines and the maintenance of related documentation formats. And, the enhancement of policies understanding through professional educations and on-the-job training courses may help promote more active policy execution environments.

The NLPUL is a system for the establishment of normative rules prior to compulsory regulations, so its fundamental framework should not be easily rattled by the changes of social environments. For the sake of it, abrupt changes or bold improvements may as well be avoided. In order to achieve the earlier settlement of its policy devices, wholly within the framework of the system of NLPUL, it is required to rearrange the execution standards of individual policy devices for the preclusion of unnecessary public complaints and procedural confusions. Not only the prior rearrangement of those execution standards, but it is required to strengthen afterwards maintenance devices for the prevention of illegal development behaviors. And, through the connection of various kinds of assessment devices, it is advised not only that its policy execution procedures should be simplified, but also the conflicts among devices should be eliminated. Meanwhile, as mentioned, policy execution environments facilitating the better understanding and execution of newly-devised policy devices are also so important that professional educations and on-the-job training courses for on-site official works and urban planning professionals, etc. should be strengthened. Last but not least, every effort should be made for the built-up of enough basic information for policy executions and the maintenance of data updating.

Ultimately, the different kinds of policy devices introduced under NLPUL are ones
that are expected to set the fundamental framework of national territorial managements in planned manner. So their amendments should be approached from comprehensive points of view, which requires continuing scrutiny and tons of improvement efforts of them. Among those, such as 2nd-type District Unit Planning, Development Behaviors Permit, Forced Provision of Public Facilities from Private Sector, etc. are possible to be improved in rather a shorter Period. But, the eventual improvement effects are supposed to be maximized when the basic format of spatial structures are well set at the upper-level of such policy devices as Urban Comprehensive Planning and Urban Management Planning. Hence, in order for the improvement of a device not to constitute a barrier to another device, nor to limit its improvement effects, it is recommended that future studies should be continued in ways that policy amendments are in connection with the detailed investigation of inter-relations among different policy devices.

In recent years, Korean real-estate market has been changed more rapidly as a result of the globalization of capital market, the introduction of MBS, ABS and REITs, growth in the housing loan market, etc. Also, the interest rate and composite stock exchange index have sensitive effects on the real-estate market as the relationship of real-estate and capital market gets closer. Eventually, these trends have been forming the connection to the international capital market.

Accordingly, it is the time for us to establish the framework of the real-estate policy
based on the systematic and deep research on the real estate market instead of real-estate policy to promote the economy only.

The purposes of the study are to observe real-estate market trends continuously and to analyze the policies related to the real-estate market announced by the Ministry of Construction and Transportation and the Ministry of Finance and Economy and so on. So, we examine the influence of those kinds of policies and problems, and forecast the real-estate market.

This report comprises of three chapters – the general economy trend, the real-estate market and policy, and the forecast of real-estate market.

The rate of economic growth, the price index, consumption and etc. are explained in Chapter 1. Chapter 2 explains the real-estate market trends by using the real-estate price index, transaction data and market survey, and periodically examines the governments policies related to the real-estate market circumstance.

The real-estate price has been stabilized after the announcement of government's composite policy to stabilize the real-estate price on Oct. 29th in 2003 which is collectively composed of the supply of housing, the betterment of a capital flow, the regulation of speculations, taxes, and so on. For all that, the real-estate transaction has suffered from a sharp decrease through demand- restriction measures like housing transaction declaration system.

The forecast on the real estate market is explained in Chapter 3. In the second half of 2004, the real-estate price shows a declining tendency because of the decreased demand for real-estate caused by government’s strong speculation curb and the stagnation of construction industry. We expect that a housing price and a housing rent fall by respectively 2% and a land price rise by 2% on the average.

This report might have vulnerable points in some aspects, due to the insufficiency of data and the absence of standard assessment method. More sophisticated and synthetic information and collection-system for the real-estate market are necessary for the realistic and beneficial policy establishment. We believe that we could produce more timely and accurate report afterwards through the accumulation of further studies.
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This report might have vulnerable points in some aspects, because of the insufficiency of data and the absence of standard assessment method. More sophisticated and synthetic information and collection-system for the real-estate market are necessary for the realistic and beneficial policy establishment. And we believe that we could produce more timely and accurate report afterwards.

The ratio of the number of housing units over the number of households is 101.2% in 2003, which implies that the housing shortage problem is almost alleviated in the aggregated level. However, the households of substandard housing reach 23.4% as of 2000,
where the minimum housing standard is considered as for housing area, housing facilities, and number of rooms. Low income households tend to reside in the inferior housing units and to suffer from the overburden of the housing expenses. Thus, the housing welfare discrepancy between the high income class and the low income class is increasing too.

To enhance the housing welfare for the low income households, the Minimum Housing Standard is enacted by the House Act, and Housing Comprehensive Plan(2003-12) includes various housing support programs targeting low income group based upon their income and housing level.

The purpose of this study is to reorganize the various housing programs working at present to make more equal distribution of the government support (“to whom” and “what”) and to establish the effective housing service delivery system (“how”). Therefore, this study reviews the present status of the housing programs and the delivery system, and analyzes the problems they possess. Case study for the selective foreign countries can give some lessons to establish the effective housing programs and the delivery system in Korea.

In chapter 2, housing support programs shown in the Housing Comprehensive Plan(2003-2012) and their service delivery system are reviewed. Housing programs are categorized into three parts, which are public rental housing provision, housing expenses support, and house improvement support. And the housing service delivery system is divided into two parts, which are administrative system and executive system, to be analyzed in the view of specialty, effectiveness, accessibility, responsibility, comprehensiveness, and aggregateness.

In chapter 3, supporting effect and the problems of the housing programs are analyzed. As a result, housing programs seem to have positively affected on enhancement of the housing welfare level and the housing satisfaction of the beneficiaries. However, the programs reveal some problems in the performance and the equality of the provision. When we compare the benefit and the income levels of the beneficiaries for the various housing programs with the income distribution of the target group, we found that the benefits are not equally distributed among various low income classes. Some are given overlapped services by the different programs, while the others are given none from any
housing program.

In chapter 4, housing service delivery system, which consists of the administrative system and executive system, is analyzed to figure out the problems. The first one is that the administrative system and the executive system are operated separately by the different ministries. The former is governed by the policy making authorities like Ministry of Construction and Transportation (MOCT) and the Ministry of Health and Welfare (MOHW), while the latter is governed by the Ministry of Government Administration and Home Affairs (MOGAHA). Thus it is difficult for the policy making ministries to control the execution process. Second, housing service delivery system is so vertically structured that the local authorities are executing their duties passively rather than autonomously. Third, there is shortage of local government officials working on the housing related service who have specialty on this area. Fourth, beneficiary selection criteria, service contents, and delivery process of housing programs are separately operated without any integrated coordination. That causes overlapped or excluded service for the target group.

In chapter 5, housing programs and delivery system for the selective foreign countries such as the United Kingdom, U.S.A., and France are analyzed, which can give some lessons to establish the effective system in Korea. And finally in chapter 6, basic direction, reorganization of the housing programs to be effective, and establishment of the delivery system to be equal distribution are suggested. Housing programs are reorganized to have consistent criteria of household income and afford ability in order for the beneficiaries to assure the minimum housing standard and to give the opportunity to choose the most favorable one by themselves among the various housing programs. And for the establishment of housing service delivery system, the followings are suggested to prevent the target group from overlapped or excluded from the housing support programs;

1) coordination between the policy making ministries of central government,
2) role sharing between the central government and the local government,
3) reorganization of the scattered housing related posts in the local government in order for the housing related duties integrated or aggregated,
4) inducement of active participation of private sector in housing service delivery network.

The low income groups' housing stability is main object of housing and social welfare policy. A comprehensive plan of housing (2003 ~ 2012) treats the low income groups' dwelling welfare elevation an important subject. Ten hundreds thousand units of public rental housing will be supplied in next ten years, management of public rental housing has risen to main subject of housing policy. For preparing in this situation, it is necessary to study on establishment of efficient housing management system.

This study are consisted of 5 contents as follows:

Chapter 1 described necessity, purpose, method of study and main preceding this study. Chapter 2 shows to present condition and management policy of public rental housing. Chapter 3 views problems to the management condition of public rental housing, and management of public rental housing. And chapter 4 considered an international comparative study on management system of public rental housing. It includes England, Japan and Singapore. Chapter 5 suggests to induction of some strategies for improving of dwelling qualification standard, and efficiency of facilities management. Chapter 6 defines reorganization of system of public rental housing, and direction for establishing of governance system of housing management.
Public rental housing performs definite policy way to achieve the low income groups' dwelling stability as well as function of social welfare resources. Construction of efficient rental housing management system is one of the important policy subject. In order that governance system of housing management settles successfully, the government function, tenant management commission and establishment of public housing management organization is essential.

Starting from 1980's, the residential estate development project have served for realizing national core policies to solve serious shortage of houses in urban regions, to give opportunities for homeless people to get their own houses, and to control the price rising of housing. However, problems related to current public residential estate supply are being alleged such as discordance of supply method, lack of self-sufficiency, unplanned development, and etc.

Currently, arguments of the discordance of residential estate supply method are being alleged. Public residential sites with an area of over 60m² are supplied by lottery method with the appraised value, but from January 1999, the housing sales price got totally free. The public rental residence for low-income bracket and the residence less than 60m² for sale are regulating the residence's rental price including rental deposit. In the other side, the supplying price for the residence over 60m² for sale are totally free and in certain
regions, in view of the reality that the private residence prices are rising, the present residence supply method which supplies the public residence with appraised value to supply these residences needs to be totally reconsidered. In case of large residential sites for sale and private residential sites, therefore, the plan of supplying with the price approached to the market price is presented.

To redeem the margin profits of public residential estate, it can be considered in a direct method which revises upward the residence cost and in a indirect method which regulates the residence cost. The direct method consists of charging taxes and interests or introducing a competitive bidding system, and in case of introducing a competitive bidding system, cash bidding method and bond bidding method are considered. The indirect method consists of supplying the residence in a transparent method, although it supplies in a moderate price as usual.

The residential estate development project is causing problems like deepening in dependance of employment on big cities caused by lack of economic self-sufficiency, serious traffic problems and expenses in excessive infra facilities, and etc. Self-sufficiency means to make most of the citizen's various activities in its own city, not in external cities.

The self-sufficiency of a new city depends on the population of the developed city and bigger the population it gets, the self-sufficiency and growth potentiality will increase. Considering the citizen's life quality level and each kind of service population inside the city, population of 200 to 300 thousand is being estimated as an appropriate scale of a new city. A simple idea definition for self-sufficient city is a city with 1.0 of job-housing ratio. There are no new cities with 1.0 of job-housing ratio in other countries. (England 0.6 ~ 0.7, France 0.3 ~ 0.4, Japan 0.1 ~ 0.4)

For strengthening the self-sufficiency of residential estate development region are as followed.

First, it needs to extend the idea of self-sufficient facility site. Including the circulate industry in accordance of article 2 of the Circulate Industry Development Law and self-sufficient facility site of article 2 of Public Residential Estates Law, large shopping
mall, outlet, and others must be induced to create the employment in the residential estate development region.

Second, it needs to increase the type of urban industries and the enterprise scale. According to the residential estate development business management regulation the industry types that can move in is limited into urban industries for firms, direct facilities of venture business, software business facilities, so it is difficult to induce the large companies.

Third, construction of apartment type factory must be activated. Under the circumstances of the current system, the apartment type factory is the only form to move into the residential estate development region, but the examples managed in the residential estate development region are limited in circumstances for the construction with the purpose of strengthening a deliberated self-sufficiency. To strengthen the self-sufficiency of the residential estate development region it needs to activate the construction of apartment type factory.

Fourth, it needs to newly establish the secure prescription for self-sufficient facility sites. The self-sufficient facility site of the current residential estate development business management regulation, includes on the public facility site which the secure prescription of self-sufficient site is in vague situation. Therefore public facility site and self-sufficient site should be divided and add the plan for the self-sufficient, and needs to add the self-sufficient site secure prescription. In this self-sufficient site, it needs to include the commercial business site. The commercial business site also creates employment just like the apartment type factory. Also in the aspect of strengthening the self-sufficiency of residential estate development region, huge residential estate with an area of over 3,300,000m², has to clarify that it must prepare a 6.15% of self-sufficient site in its own site.

Currently, the situation of unplanned development is being progressed. Therefore in this moment it must be approached in two different policies to alleviate the social abuse by the unplanned development.

First, the previously occurred development has to be recovered and these should be
done by the nation and the local self-governing body.

Second, to minimize the expected unplanned development must be included in the new act. The present unplanned development recovery problem depends on the government's will, and arbitration strength, but the urgent problem in this situation is to alleviate the future expected unplanned development problems.

Along the plans of law for land development planing, housing development system in accordance with infrastructures, permission for development action, and land suitability assessment are introduced to arrange an institutional formality to solve problems, and these plans can alleviate most of the aspects of the unplanned development by the problems of wide land use emphasis. If these plans could supplement several alleged problems as a plan or management, they will contribute the alleviation of the unplanned development.
utilization and enhancing expertise of its management agency, through the overall review of actual conditions and problems of current management system.

Under these policy backgrounds and needs, this study aims to establish basic policy directions in a kind of general plan for efficient management of government-owned real estate, and present rational management system reforms that can lead to the enhancement of property utilization and its organizational expertise.

Major results of this study are as follows. First of all, linkage of national land policy, effective property transaction (purchase and disposal), assemblage of small parcels, efficient use and management of holding lands, and improvement and reforms of management system and policy are shown to be basic policy directions of government-owned real estate management. In accordance with these basic policy directions, the concentrative subjects of this study are classified into the following three sections, such as managerial operating base building, methodological improvement of property management and disposal, and organizational improvement of property management agencies.

Firstly, in the system building section of managerial operating base, it presents the simplification of property management and disposal criteria instead of their supervisory affairs intensification, the comprehensive survey of whole properties and its computerized classification by their availability, and the enhancement of linkage between property utilization and land use planning by the general plan of government-owned real estate.

Secondly, in the methodological improving section of property management and disposal, it presents the disposal facilitation of unnecessary properties instead of purchase and assemblage of publicly necessary lands, the rationalization of property exchange, jurisdictional change and gratuitous transfer, and the system improvements of property lease, trust and development.

Thirdly, in the organizational improving section of property management agencies, it presents the advancement in local civil servant's managerial expertism and skill, the establishment of evaluation system among property management agencies, the increase of outsourcing in professional business areas and the reorganization of national miscellaneous
property management agencies.

To sum up, the result of this study is to contribute to the external reliability of a performance audit on government-owned real estate management situation, and ultimately to suggest the basic schemes which are necessary for the government-driving system improvement and reform work.

For a long time the increase of housing supply has been the main agenda of housing policy in Korea. According to the higher distribution rate of housing, the goal of housing policy has been changed from higher housing supply to higher welfare in housing. With changing goal of housing policy the housing statistics are high on housing policy. That is, the needs of new data have increased and interest and demand of statistics produced have been higher. In order to match up with needs and demand, we studied the housing statistics in many sides. The purposes of this study are to find necessary and complementary statistics and suggest the ways that let statistics serve accurate information and standard in housing policy.

This study is organized as follows. First, the goals and methods of the previous housing policy are investigated. Also, the housing data and housing statistics system at the time are studied in terms of the usefulness and fitness where the government made a plan and put through a program of housing.

Second, the basic guideline of a foundation of housing statistics system is presented,
which is expected to take a role of useful and accurate devices to know the state where we are and to evaluate a policy program. Also, the directions and means are mentioned to get the goal of future housing policy.

In detail, we suggest a guideline of statistic system in the side of production, distribution and management. And all indexes are classified into 5 groups and each index in each group is investigated. That is, 5 index groups are quantity index including housing stocks, quality index including below average housing condition, market index with sale price and rent, housing investment index with the governments and private investment and international housing index. Also, we made groups under the main and supplementary indexes.

Third, the improvement of census in terms of household and housing is studied, in which it serves the national central statistics.

Forth, we mentioned the necessity of the housing survey as a separate statistics with census, and mentioned the requirement and blueprint of the survey.

Finally, this study presents applications of indexes.

We expect that this study contribute to foundation of housing statistics system.

In 1997, foreign currency crisis happened. Land and housing markets froze, and real estate prices fell down dramatically. To make real estate market stable, many regulations moved out. Among others, the government implemented deregulation on the ceiling of
sales prices of new housing since January 1999. Partly because of the success of economy restructuring policies and partly because of the deregulation, housing prices increased and soared again since 2001.

By the way, the land developed by the public sector was supplied with appraisal prices, which were lower than the market prices. This policy aimed to supply the housing with cheap prices. Nevertheless, the private housing construction companies determined to make the sales prices of new housing almost equal to the market prices. Social critics on land and housing supply manners arose because it seemed only to allow the private companies to earn development gains.

From early 2003, many NGOs claimed that the development gains should be recaptured, and also the building costs of new housing should be open to the public. They argued that these measures would lead housing prices to be stable. On the other hand, the private companies objected to those measures. They argued that the measures were against market principles. Social conflicts increased on the verge of the National Representative Election on April 2004.

This study aims, neutrally, to suggest the policy measures to address the conflicts. It consists of five chapters. Introduction deals with the background, purpose, and methodology of the research. Chapter 2 describes the theory and proxies of housing market, particularly how the sales prices of new housing are determined, who earns the development gains from land development and housing construction, and what are the basis sources of conflicts on housing market.

Chapter 3 analyzes the land development and supply system by the public sector. Based on the empirical and legal analysis on the manners of land development and supply, it suggests as follows; the land for middle and lower income groups' housing (smaller than 85 square meters) shall be supplied with appraisal prices, which are lower than market prices. The land for middle and higher income groups' housing (larger than 85 square meters) shall be supplied with market prices, i.e., the bidding prices. The funds generated from the bidding system shall be used for the housing welfare of the lower income groups.
Chapter 4 analyzes the housing supply system. It starts with the historic evolution of the ceiling system of housing prices, and summarizes the pro- and anti-arguments on the openness of the building costs. It suggests as follows; for the housing, which land is developed by the private companies, prices regulations are not necessary. For the housing, which land is developed and supplied by the public sector, two-tied approaches are suggested. For the middle and lower income groups' housing (smaller than 85 square meters), the supply prices shall be linked with the prices of land supplied by the public sector. For the middle and higher income groups' housings (larger than 85 square meters), the regulations on supply prices ceiling are not necessary.

Chapter 5, the Conclusion, summarizes the findings and policy suggestions of the research.

This study aims to present the policy orientations for strengthening basic system formations of the efficient & transparent real-estate markets in Korea. The subject of study is the Korean land & housing markets, and the scope of its contents covers the evaluation of transparency & efficiency in the markets, the analysis on actual conditions & problems of the real-estate policy & systems, the review of real-estate related policies & their operational examples in major advanced societies, and the establishment of policy-base improvements for our advanced real-estate markets.
Chapter 2 is to examine the trends in our real-estate markets, and to evaluate their level of transparency & efficiency. The former presents major attributes of real-estate markets, and examines the market trends and present situations of real-estate holding & transfer, etc. And the latter gives a conceptual definition of transparency & efficiency that are essential conditions for advanced real-estate markets, and evaluates the level of transparency & efficiency in our markets by questionnaire & computational analysis based on this conceptual definition.

Chapter 3 catches the actual conditions & problems of our real-estate policy & systems by twofold approaches: one takes a general glance at the outline of real-estate policy, the other analyzes sectoral details of those systems such as holding, transfer, tax system, and information. These analyzed items are to be used as fundamental materials for abstracting policy suggestions from the comparison to those systems of advanced societies', and presenting policy-base improvements for our advanced real-estate markets.

Chapter 4 reviews real-estate related policies & operational examples in 5 OECD member countries(UK, France, Germany, Japan, and USA), and draws some special mentions and policy suggestions out of them. In doing so, it puts emphasis on the characteristics of those various countries, and centers on overall real-estate policy & systems in Europe, land utilization & information system in Japan, and real-estate transfer system in USA. These comparative suggestions give a basic frame of reference to establish the policy-base improvements for our advanced real-estate markets.

Chapter 5 presents the policy-base improvements for our advanced real-estate markets, as the conclusion of this study. On the basis of the above analyses & reviews, It takes a basic position for the advanced markets, and suggests various policy-base improvements that our real-estate policy & systems could lead to the trustworthiness and systematic operations. Major policy-base improvements are as follows: achievement of definite ownership, establishment of orderly transfer, real-estate information system building, and realization of fair taxation.

Finally, Chapter 6 is a conclusion that summarizes the findings and policy implications.
This research is based on the assumption that local community is a value which must be actively promoted in urban areas, therefore, urban housing redevelopment projects should have a legal framework for assessing its impact on local community and planning to promote and rebuild local community. It also assumes that in order for the arbiter to have leverage in arbitrating conflicts of interest in urban redevelopment projects, the legal framework should incorporate a concept of the common good. In this case, it can be protecting the housing rights of the residents. The research puts case studies to exemplify many kinds of considerations which will be needed to construct such a legal framework. Therefore, it is not possible to draw conclusions from the study, but is only to indicate what the case studies have suggested.

The first two case studies show the profit motive challenging, overcoming, and motivation for building community. This indicates that the legal framework should design a win-win situation where the benefits of local community can be enhanced in the project at the same time that participants are protected against loss, and the chance for outside investors to reap large gains is minimized.

The Incheon case shows that the low income families could not hold out for long without enhancing their incomes, therefore they abandoned local community by selling out to outside investors. Promoting local community requires that the project not be dragged out too long. Small-scale projects would seem preferable to large-scale projects.

The cases show that the residents share in the very strong widespread expectation of making landfall profits in land and housing. Unless the chance for such profits is much
reduced, even a good legal framework protecting housing rights would probably be manipulated to be used for profit-taking. Because people tend to judge their gains and losses based on the expectation of their investments as long as this expectation for large profits exists, it probably would not be possible to design a win-win situation for both local community building and redevelopment project profit.

The cases show that people are strongly motivated to protest when they are being excluded or treated unfairly or threatened. For an arbiter to be able to play a good role in arbitrating conflicts there must be not only an ideal of the common good defined by law, but also a procedure for carrying out the project that allows all affected persons to sense that they are included in the negotiation process. There is a consistent finding in the case studies that the local administration or the police do not take on the role of arbiter in redevelopment conflicts. The research here would indicate that since the law does not provide for the common good nor include a procedure that enhances fairness, the administrators and police lack meaningful ways to arbitrate conflicts. The assumption in this research has been that urban redevelopment takes place in a democratic arena of negotiations. There is clearly a need to establish arbitration procedures other than the court system, which takes a long time necessarily. The arbiter could be an ombudsman or a commission composed of a variety of knowledgeable persons, or a part of local administration. This research does not indicate what body would best acts as an arbiter.

Although local community and housing rights have been valued for the common good, their benefits are not as apparent to individual residents as expectations of profit. When local community and housing rights are included in the legal framework of redevelopment projects it will be necessary to have specially trained persons available, such as community organizers or community welfare workers to help communication, information dispersal, education programs, consensus formation strategies and so on.
Background

Korea has pursued the National GIS project since 1995. The first phase of the National GIS Master Plan (1995-2000) focused on expanding the nation's spatial information infrastructure. The first 5-year plan involved quantifying the nation's basic maps and thematic mapping such as administrative district and road mapping. There was no serious shortage of competent professionals, as the project was mostly assigned to private companies specializing in GIS.

During the second phase of the National GIS Master Plan (2001-2005), the central and local government took the lead in establishing various GIS based information systems. Areas of GIS application dramatically broadened and the number of GIS users surged. Some colleges opened GIS departments and expansion of GIS software boosted education program for user application. However, the public sector suffered from lack of qualified human resources to deal with the expanding GIS-based information system. The conventional recruiting system in the public sector was the biggest stumbling block.

Despite the growing number of GIS-based application systems such as land management system, underground facility management system and urban information system, expertise from the public sector necessary for administrating these systems were lagging far behind. As a result, the GIS based administrative information system built by private sector could not be utilized in full scale.

Purpose

Although GIS education program is primarily aimed at public officials in the central
and local governments, Middle and high school geography teachers are also an important target groups of the education. The purpose of GIS education is to improve efficiency and provide citizens with quality public service by enabling public officials to understand and actively adopt GIS in their working process.

For middle and high school geography teachers, the program is to serve as a guideline to understand and teach GIS concept explained in school text books.

The program is also intended to instruct those from the private sector in rapidly growing GIS technology and thereby enhance national competitiveness. In addition, the program is expected to provide college students with job opportunity through useful practical training in working field and expand GIS user base among population.

<table>
<thead>
<tr>
<th>Education targets</th>
<th>Objective</th>
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| Public Officials    | - Provide advanced administrative service by enhancing ability to use NGIS systems  
                       - Improve professional competence by coordinating theoretical and practical education on GIS overall |
| Teachers            | - Enhance ability to learn through better understanding of geographic information introduced in text books.  
                       - Create educational environment conducive to educating next generation GIS professionals by boosting students' interest in learning geographic information |
| Industry Workers    | - Enhance national competitiveness in GIS technology and promote GIS-related industries by providing chance to review and promptly acquire GIS knowledge.  
                       - Observe domestic and global trend to promote exchange of GIS information among workers and motivate them to develop technology competence. |
| Students            | - Teach college students and graduates of non-GIS majors the use and knowledge of GIS useful to broaden job opportunity  
                       - Expand GIS user base among population and reach consensus about NGIS projects by raising interest in GIS |
Key Tasks in GIS Education Program

1) On Site Education

To effectively meet the newly generated demand for GIS education nationwide, the education program divides the nation into 6 areas and designates universities as GIS education bases in each area. The designation was made through competition among universities that have GIS department and necessary facility such as computers and software.

The number of colleges for each area was decided according to the size and population of the region; 3 for the Seoul metropolitan region, 2 for southwestern Jeolla and southeastern Gyeongsang region, respectively, and 1 for Gangwon, Central and Midwest and Jeju region, each. The designated colleges run training program four times a week under government sponsorship. The curriculum is designed according to the trainees' ability. Roughly, beginners', intermediate learners', teachers' and public officials' courses are provided. Practice and theory each make up half the course.

As the Main Center for NGIS Education, the KRIHS designates colleges and provides them with education programs and guidelines. A total of 1,286 trainees were educated in 10 colleges in 2004 and an additional 1,440 will attend the course in 12 institutions in 2005.

*Figure 1* Network-decentralized GIS Education Scheme
2) Online Education

It is not easy for public officials and teachers to suspend their routine job for more than a week to attend an educational course. That is why they hesitate to take the course even though they understand the importance of education. On-line GIS course is for such people. As online education is carried out on the Internet, there is no constraint on time or space and it is highly effective.

In August 2003, we opened an online education homepage(www.e-gis.or.kr) and people from all walks of life such as public officials, teachers and students are using the education page. By 2003, 31 online education programs were provided and 19 programs have been added in 2004. GIS electronic library contains 600 GIS-related study results, online dictionaries of terminology, free software, GIS practicing programs and video clips of seminars.

V - 2

Applications of GIS-based Spatial Analysis Methodology
GIS기반 공간분석방법론 적용 연구
Young-Pyo Kim, Eun-Sun Im
RR 2004-35 · November 2004 · 240 pages · Korean

The purpose of this research is twofold. First of all, it aims at developing a GIS based spatial analysis methodology that can be utilized for exploring spatial patterns and solving spatial problems. Second it attempts to examine usefulness of a GIS based spatial analysis methodology by applying the methodology to an actual case.

To understand current trend and future prospect of GIS based spatial analysis, it conducts heavy literature review on existing research works, including articles in 5
domestic journals (1995 ~ 2003) and 2 international ones (1991 ~ 2003). It analyzes and synthesizes previous research works and then defines general concepts of a GIS based

<Figure 1> GIS-based Spatial Analysis Methodology

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<tr>
<th>STEP</th>
<th>GIS based Spatial Analysis Methodology</th>
<th>Time</th>
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<tbody>
<tr>
<td>logical design process</td>
<td>define problem</td>
<td>reporting problem</td>
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<tr>
<td>logical design process</td>
<td>What is?</td>
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<td>logical design process</td>
<td>What should be?</td>
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<td>logical design process</td>
<td>Goal</td>
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<td>logical design process</td>
<td>select approach</td>
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<td>logical design process</td>
<td>Inductive method</td>
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<td>logical design process</td>
<td>deductive method</td>
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<td>logical design process</td>
<td>scenarios for solving problem</td>
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<td>logical design process</td>
<td>Conceptual GIS Modelling</td>
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<td>analytical process</td>
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<td>build database</td>
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<td>GIS modelling</td>
<td>decision-making</td>
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<td>alternative</td>
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<tr>
<td>Decision maker</td>
<td>spatial decision making</td>
<td>implementation</td>
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spatial analysis methodology for spatial problem solving. In defining the concepts, it divided the areas of GIS based spatial analysis methodology into three categories: exploration of spatial patterns, support of spatial decision making, and forecast of space-time changes. After that it develops specific methodologies for each and verified them by conducting a case study.

The term GIS based spatial analysis methodology in this research means all GIS modeling process that supports spatial decision making. As shown in the <figure 1>, A GIS based spatial analysis methodology consists of two phases in broad sense.

The first phase is logical design process. This phase identifies the nature of problems, sets the goals, builds appropriate scenarios, and prepares GIS modeling plan. The second phase is analysis process. This phase includes data processing, sequential execution of analysis, and selection of alternatives. Then, the results of analysis are adopted after validation and evaluation process.

Spatial modeling method in this research can be classified into descriptive, prescriptive, and prospective ones. Each model can be used either alone or together. The choice and combination depend on the nature of problem.

Descriptive GIS modeling deals with data manipulation and analysis to conceptualize and visualize spatial phenomenon. It includes geoprocessing, basic spatial analysis, and thematic mapping. Framework of Descriptive GIS modeling is shown in <figure 2>.

![Figure 2: Descriptive GIS Modeling](image-url)
Prescriptive GIS modeling uses even more spatial analysis methods. In addition it also includes methods of generating and evaluating various alternatives. It supports analysis of more complex problem and generates optimal solutions. To do so, it includes advanced spatial analysis, statistical models and algorithms. It is build upon the Descriptive GIS Modeling. Overall framework of Prescriptive GIS modeling is shown in the <figure 3>.

![Prescriptive GIS Modeling](image)

Prospective GIS modeling utilizes dynamic simulation and forecasting. It is for forecasting unstructured and non-linear spatial problems. It inevitably includes spatio-temporal forecasting techniques in addition to the descriptive and prescriptive models. This model requires not only spatial data but also temporal data. Thus, it requires spatio-temporal database and spatio-temporal simulation techniques. Details for Prospective GIS modeling is presented in <figure 4>.

The GIS based spatial analysis methodology established in this research can be applied from a simple spatial problem to more complex and dynamic ones. To solve complex
spatial problems, spatial analysis methodology also need to be complex. The methodology suggested in this research consists of diverse sub components. So it can be applied to various different spatial problems. The main concern of this research is spatial problem. It partly introduced the concepts of spatio-temporal analysis. However, the attempts is not thorough enough. The research on GIS based spatial analysis methodology should be evolved to that on GIS based spatio-temporal analysis methodology.

<Figure 4> Prospective GIS Modeling

GP : GeoProcessing
BSA : Basic Spatial Analysis
ASA : Advanced Spatial Analysis
TM : Thematic Mapping
S_model : Spatio-temporal forecasting model
Pi : Parameter for system analysis

Data transfer(GIS-outside)
Available off-the-shelf GIS software
Developed in C language or
Covered by external software
Driven by the pursuit of peaceful disposition between the South and the North Koreans and the open policy of the North, the pursuit for economic cooperation and exchange between the two countries have never been as active as they are today. This trend is evident in the promotion of economic cooperation such as road and rail connection project, industrial complex development, and joint management of Imjin River basin as well as in various areas of culture, tourism, and academics. The level of interaction has extended from the government to the private enterprises and groups.

Along with the expansion of exchange and cooperation between the two Koreas, there is also a rise in interest and demand for information on topographic features such as road, rail, streams, and relevant facilities. However, due to North Korea being a closed society and the existing military confrontation South and North Korea it had been virtually impossible to collect any data on North Korea's topography. Much like South Korea, any country in the world would have strict restrictions against releasing detailed information on their topography and geography. It is especially true in countries that are in military confrontation. However, since the year 2000, with the spread of commercial use of high resolution satellite image, the situation is completely changed. We can access topographic information on places around the world through high resolution satellite images that are comparable to aerial photos taken 1 meter above ground level.

This research establishes ways to acquire geographical information of North Korea using IKONOS, a high resolution satellite image, while suggesting strategies and implementation methods to compile North Korea region's geographic data. The ultimate
The objective of this research is to effectively acquire the region's geographic information to utilize it in order to further exchange and cooperation with North Korea and to strengthen mutual trust between the two Koreas.

In order to maintain objectivity and efficacy of the research results, we collected geographic information on southern regions of Pyong Yang City. The research was conducted in a systematic and efficient way through joint participation from college professors, private sector experts, and researchers. Difficulties arose in interpreting the attribute of topographic features of areas in North Korea through satellite images but they were resolved with the assistance from North Korean refugees who had been long time residents of the area.

In order to collect geographic information using satellite image data, there needs to be a standard for producing geographic information. Depending upon the purpose of the information use, the scale and category are determined. The standard is also used as a guide to acquire relevant satellite image data. The processing of satellite images depends on level of preprocessing but generally they go through the entire process of geometric correction and rectification. Digital mapping is possible by producing epipolar image from stereographic images. DEM produced through digital mapping is used to produce rectified images and each vector data are stored by layers in database.

Errors may arise when producing geographic information on North Korea region through the above process. We determined the level of error in location that may arise when information is derived only through satellite information without ground control points. The possible errors in location have been evaluated for each stereo graphic image and mono image production. After comparing the value established through GPS and that of satellite images, it is found that the vertical error in stereo graphic images was around 0.9m while horizontal error was around 4.6m. On the other hand, there was a error of around 9m for both left and right sides of mono images. When compared with the process of public survey, we can see that the level of accuracy in stereo image is considerably high within tolerance. Mono images missed the standard by around 3m. However, the entire image is focused toward the same direction resulting in accuracy in the relative
location between topographical features in the images. In conclusion, the image data are legitimate to use in research or commercial purposes.

In order to utilize the geographic information of North Korea in industrial complex development, road and rail connection project and other joint development and cooperative projects, a scale of 1/10,000 would be appropriate. The number of categories on geographic information needs to be established with 52 vector layers composed of rail, streams, road, buildings, land use, facilities, topography, etc. Satellite images makes interpretation possible for geographic images reduced to 1/10,000 and IKONOS images are used to gain 3 dimensional locational information without ground control points. When geographic information on entire North Korean region is produced under such conditions at 1/10,000 scale, the outcome is a total of 5,580 maps expected at KRW 98.3 billion. However, when considering the mountainous landscape and the simple topographical features of non-urban regions, a scale of 1/10,000 is an appropriate scale for urban areas. In addition, when information is produced for urban areas of North Korea that are categorized as cities by the administrative district, the total output of geographic information reduced to 1/10,000 is 816 maps with an estimated cost of around KRW 15 billion.
geographic object information for land parcel management from high spatial resolution imagery. This is the second fiscal year research on this project, which is focusing on feature identification with various region growing methods and shaping with vector concept raster edge management approach.

This study has three major parts. The first part is to develop a method to merge segments of an image that is over segmented because the spectral variation within a geographic object evoked. The segments were named as sub-patch or just patch in this study. Adjacent sub-patches are amalgamated in a region growing procedure that uses a topological approach to facilitate the analysis of the spatial relationships between adjacent patches. The similarities of all adjacent sub-patches were examined using several methods. A multi-variate Hotelling T square test was examined to draw on the classes' covariance matrices. Sub-patches which were not sufficiently dissimilar, were merged to form image patches.

This method results in some improvements in identifying homogeneous region. However, the homogeneity of a image segment in the first stage was high, which means that image segments have very small standard variations of spectral intensity measurement values. It made a very sensitive result with the statistical parameters. To mitigate this issue, several methods were implemented, such as methods based on the whole scene's Z-score test, Euclidian and color distance, and spectral shape. The suggested methods did not solve the problems thoroughly, but they had their own characteristics which can make some improvement when they were used in complementary ways.

The second part is to build a method to adjust different spectral illumination measurements of facets in a geographic object. Geometric shape in a surface material sometimes produces different slopes that have different illuminations. It causes some difficulties to get same classification results or to identify as an object for the different facets in a surface material. A regression method is suggested to adjust the spectral information of different facets in a surface material using image segments. The method to adjust spectral information in a building's facets was very successful. The most important advantage of this method is to modify the intensity value of spectral
information that is caused by different facets with keeping its spectral response. This method can also be implemented in an adaptive way.

The last part is to construct a method to generalize the shape of a geographic object extracted in this study. Edge of geographic feature is a crucial information to identify the feature. Edges are extracted by various methods. Edges extracted are composed of pixels in remote sensing data. It is not easy to handle the edge pixels as lines. To mitigate this problem, this study proposed a method to adapt a vector concept to the edge pixels. The edge pixels were defined as lines that have nodes, vertex, and arcs by the suggested method in this study. Then, each line was assigned ID, and topology of line segments were built. Based on the topology, the segments were tested by their directions, degree of curvature and etc. The information analyzed can be useful to identify geographic features because the characteristics of the edges of geographic features have typical patterns. Using this method, edges of a geographic object can be regularized for more concrete shapes, for example, edges can be made by more strait form and corner edges can be modified into an orthogonal shape corner, etc.

This study contributed to analysis of high spatial resolution remotely sensed data, including the data acquired by Kompsat 2 which is planned to launch in 2005 academically. These analytical tools can make a contribution to utilize the coming Kompsat 2 imagery, specifically in the area of land management system to provide more recent land use/cover information with land parcel units.
Nowadays, Korea faces various spatial planning issues such as administrative capital relocation, environmental protection, disaster management, and so on. National Geographic Information System (NGIS) is a good policy measure to cope with such problems. However, outcomes of NGIS project are seldom used in solving diverse spatial problems. Therefore, it is necessary to set a goal to promote the use of NGIS and to prepare detailed action plan and road map.

In this sense, this study aims at analyzing current status and problems of NGIS project, setting future directions of NGIS project, and suggesting policy measures to promote the use of NGIS in various spatial planning practices.

The study consists of six chapters. Chapter 1 introduces background, purpose, scope, and method of the study. The goal of this study is to suggest the ways of solving many spatial problems with NGIS. To do so, it pursues to minimize social conflicts and costs. The scope of this study is from 1995 to 2010.

Chapter 2 deals with various spatial planning issues in the new era of information society. It analyzes processes and characteristics of spatial decision making. Usually, many stakeholders are involved in a certain spatial problem. To solve the problem, there should be rational alternatives and sound consensus.

Chapter 3 examines outcomes, status, and problems of NGIS. The first NGIS project includes 5 sub-modules such as, digital mapping, technology development, education and training, standardization, and GIS application. The 2nd NGIS project includes 8
sub-modules such as, framework data, clearinghouse, GIS application, technology
development, standardization, education and training, industry development, research and
development.

Chapter 4 suggests directions of future NGIS project. Basically, NGIS project targets
general administrative works. To support spatial planning on the national level, spatial
data warehouse and spatial decision making models should be developed. This study
suggests a conceptual model for integrating individual outcomes of NGIS.

Chapter 5 conducts a case study. The conceptual model suggested in the chapter 6,
applied to the Land Suitability Assessment System. It examines how to improve actual
spatial planning practice with NGIS.

Chapter 6 proposes diverse policy measures for NGIS. The measures include building
NSDI, developing new technology and spatial analysis methods, and constructing cyber
territory.

This project is to implement the pilot study of national territorial statistics survey. The
background of this project is to execute the pilot survey on the national territorial
statistics survey according to the new National Land Management Law. The new law
pursues a new national territorial statistics survey to contribute land management policy
making. Thus, this project was implemented under the control of NGI(National
Geographic Institute) in 2004.

Many government agencies have produced a lot of statistics related to national territorial statistics. Though the statistics have been used for national physical development plan, there were some limitations because the purposes of producing statistics which were merely concentrated to the agencies' own work. To overcome these issues, new national territorial statistics survey was launched by the National Land Management Law in 2001.

The purposes of this project is to support the demands of policy makers for the national land management policy and to support the demands of planners for the National Physical Comprehensive Development Plan and other territorial plans.

This project is divided into two parts. The first part describes the implementation of the pilot survey on national territorial statistics. The second part deals with the improvement on the management system of national territorial statistics. The first part includes five chapters. Based on the introductory material in Chapter 1, Chapter 2 summarizes the object, direction and method of this project, etc. The purpose of this project is to support the demand of the national territorial statistics in the public and private sectors. In the public sector, some key indexes on the national territory are needed to support the national territorial policy and national physical development plan, etc.

This survey is based on the secondary data sources which are produced from many governments and public institutes. According to the result of this survey, the national territorial statistics database are composed of 102 indexes and 228 items. Time series database has only 4 years recent data from 1999 to 2002.

Chapter 3 identifies the concept of the national territorial index and the current production conditions of the statistics on the national territory. According to the current conditions of the national territorial index, the detailed plan on the specific parts was designed as the basic unit of data production, data format, etc. Next, the proposed indicators and items on the national territory were chosen. Since the structural design of each indicators and items' database had been finished, the survey was launched. At first, this study aimed to survey 118 indicators and 220 items, but a few of these had some
problems. Thus, this study made national territorial index which was composed of 102 indexes and 228 items. On the basis of these data, this study published a yearbook of national territorial survey in 2004.

Chapter 4 describes problems and the improvement plans for this survey. The most serious problem is the availability of source data. Some indexes of this survey have to be exempted by its insufficient raw data. And there are some possibilities of data verification errors. It has difficulties to standardize the jurisdictional area in some cases.

Some improvement plans of this survey are for the arrangement of data verification system, the change of analog data collecting system to digital data collecting system, etc.

Chapter 5 describes the direction of the future national territorial survey. For the most important fact of this project is to maximize the use of this survey's results. Main usages of indicators are suggested for various levels of national physical plans, such as national physical comprehensive plan, provincial physical comprehensive plan, and city and county plan as basic information. The indicators should be also very useful information for academia on regional study. Internet services to the public should be also very important to understand the actual condition of national regions' territory development.

Thus, this project has to be continued and widely expanded in the future. It has to be strengthened for the national territorial survey to emphasize the spatial analysis function of GIS and to enhance the use of the result of this survey. In addition to this, the infrastructure of the national territorial survey such as experts, funds, the arrangement of the law, etc. have to be prepared for the success of this project in the future. It has to be suggested for the growth of the national territorial survey project to investigate the demands of the national territorial index. Most indexes of this survey are designed by the MOCT, NGI and KRIHS. Thus, the demand is far different from the supply side of this survey.

And finally, this survey should have some closed relationship with the National Territorial Information System which is regulated by the National Land Management Law. Through this project the annual indicator statistic book has been published for citizens who are not familiar with computers. This publication is expected to be different from
other statistical year book, because it focuses on the analyzed information instead just data.

The second part mentions the development of national territorial statistics atlas management system. This management system was firstly started to develop from 2002. And through this system, the national atlas on the statistics such as population, industry, land use, etc. were made. According to the project of the national territorial survey in 2004, this system has to be upgraded to depict those national territorial indexes.

For the purpose of this, the national territorial statistics atlas management system has to be analyzed and the developmental environment, problems and future directions have to be considered. Thus, the national territorial statistics atlas management system, especially in web usage, should be designed. Finally this study suggests the future developmental direction of the system.

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National Geographic Information Clearinghouse(NGIC) is one of the key projects for successful implementation of National Geographic Information System(NGIS) project in Korea. The NGIC is a mean of providing geographic information from a variety of governmental and non-governmental sources to many users. It helps users determine their fitness for use, and providing tools to access, visualize, or order data. The NGIC is a distributed, electronically connected network of geo-spatial data producers, mangers, and
users.

The Ministry of Construction and Transportation has conducted to build NGIC since 2000. So far the main interest of the project was to make basic infrastructure and overall framework of NGIC. Now the structure of NGIC is all set, and it is time to promote its use.

The primary goal of this research is to provide measures for encouraging the use of NGIC. To do so, it firstly diagnose the current status of NGIC. Then, it draws policy measures for fostering NGIC.

In this regards, this research consists of seven chapters. Details for each are as follows.

Chapter 1 introduces backgrounds and goal of this research. In addition, it also presents methodology and framework of the research.

Chapter 2, “Participating in E-government”, deals with how to link NGIC and e-government. It constructs a conceptual model for enlarging service area of NGIC into the e-government. Then, it suggests actual policy measures for implementation of the model.

Chapter 3, “Harvesting Geographic Information”, explores current status of geographic information exchange on the NGIC. It also conducts a survey to understand demands for geographic information. Based on these investigations, it establishes a model to harvest geographic information distributed nationwide.

Chapter 4, “Linking with Land Management Information System(LMIS)”, explains how to interconnect NGIC and LMIS. In fact, geographic information for land or parcel is one of the most frequently used ones. Thus, it is clear that there will be many mutual benefits if LMIS is linked to NGIC.

Chapter 5, “Rectifying NGIC Related Laws”, mainly explores various institutional problems of building and managing NGIC. Here we have recommended amendment of related laws, as well as establishment of new ones, to support NGIC.

Chapter 6, “Establishing Geographic Information Distribution Institution”, handles issues for newly creating a organization for distributing geographic information. In fact, there should be multi-organizational efforts for distributing and sharing geographic
information in national circumstance. So, at least one organization is necessary to monitor and control whole process for distributing geographic information. This chapter suggests measures and procedures to build Geographic Information Distribution Institution.


As a whole, this research contributes to managing and developing NGIC. The NGIC is a key for building National Spatial Data Infrastructure (NSDI). It will play a crucial role for success of NGIS in Korea. In this sense, this study provides road maps for managing and developing NGIC.

Restructuring Mountain Systems in Korean Peninsula: Focusing on Mountain Range Analysis

한반도 산맥체계 재정립 연구: 산줄기 분석을 중심으로

Young-Pyo Kim, Eun-Sun Im, Youn-Jun Kim

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In general, Korean people tend to understand the national land as a whole entity for the first time while memorizing the name of the mountain ranges of the Korean peninsula. Meanwhile, the debates on the appropriateness of the Korean mountain range system have been ceaseless since the early 1980s. This study aims to indicate the problems of the current mountain range system and to prepare the correct mountain range map by analyzing the geographical features, the land shape, and the geological structure in a detailed, scientific way in order to close those debates. In order to achieve the best result of this study, a more in-depth analysis of all meaningful aspects and associated
documentations was performed. Also, a database on the Korean cyber land shape and major mountains was constituted, and a diverse space analysis by the use of GIS method was attempted. In addition, the “Forum on the Korean Mountain Range Reestablshment” was created: major mountains were visited once or twice a month along with specialized climbers, and workshops and seminars were held in the mountains.

When reviewing the mountain range system shown in several geographical books of Korea, the term “Baekdudaegan” first appeared in the Sunghosaseol by Ik Lee in the middle period of the Joseon Dynasty. Also, the ranges, ridges, and position of Korean mountains were clearly arranged in Sangyeongpyo, a geographical book of the latter period of the Joseon Dynasty. In the book, Korean mountain ranges were classified into Baekdudaegan, Jangbaekjeongan, and thirteen ridges. These kinds of traditional mountain range systems of the Joseon period were reflected in school textbooks of the Korean enlightenment period.

On the other hand, the mountain range system shown in the current public school textbook appeared when the outcome of a study on the Korean mountain range system, performed by Japanese geographic experts, was introduced to a Korean geography textbook. Gotobunjiro, who opened the gate to the study on Korean mountain ranges, arranged the results of field investigations on the Korean peninsula two times for fourteen months during 1900~1902. He announced the Korean mountain ridges in a thesis called “An Orographic Sketch of Korea” in 1903. Since then, Japanese scholars, including Yatsushoai(矢津昌永, 1904), Nakamura(中村新太郎, 1930), Kobayashi(小林貞一, 1931), and Dadeishi(立岩巖, 1976), have continually announced the results of a study on Korean mountain ranges.

Hermann Lautensach(1945) from Germany found that the Taebaek mountain range and the Nangrim mountain range were connected as one main mountain range by Wonsan Lake. He named them as the Main Korean Range in his book, “KOREA: geography Based on Field Investigations and Documentation(KOREA: Eine Landeskunde auf Grund Eigener Reisen und der Literatur)”.

Although Korean geographic experts, including Ok-Joon Kim(1970), Noh-Shik
Park(1971), Sang-Hoh Kim(1977), Suk-Oh Kang(1985), Duk-Soon Lim(1992), and Hyuk-Jae Kwon(2000), have kept studying the mountain range system since the 1970s, they have mainly insisted that some of the mountain ranges should be modified, and there has been no study on overall verification or reestablishment of the Korean mountain ranges.

North Korea changed the expression of mountain range to mountain ridge, yet in general it followed the mountain range classification system of Gotobunjiro until 1995. In 1996, the North Korean Scientific Institute of Geography rearranged the mountain range classification system, expressing the backbone of the nation as the Baekdu Daesan ridge and establishing the mountain ridge similar to the flow of Baekdudaegan.

In addition, according to the literature survey, a mountain range is a “land shape with mountain ridges that are continued in length, and their size and continuance become the criteria of mountain range classification.” Thus, in this study, a space database was constituted by collecting a digital elevation model (DEM) of the basic land shape, a geographic diagram, satellite images, mountain peaks, and valleys in order to objectively analyze the features of mountain ranges.

After analyzing the status of land shape and performing land shape modeling by the use of this space database, it was concluded that it was hard to accept the theory that the current mountain range system was established on the basis of geographic grounds. Accordingly, in this study, the size of a mountain was estimated by statistically analyzing the relative height by region. The size of a mountain and continuance of the mountain shape were made upon the criteria of defining a mountain range, and the continuance of the mountain shape was extracted through the analysis on the distribution of a mountain ridge line and continuous tendency of a mountain peak. The concrete establishment process of a mountain range system by the use of a digital elevation model data and satellite image is the same as shown in <Figure 1>.
The classification of the mountain ranges was made by identifying the first main mountain range, which is the highest and longest in Korea, pursuant to the classification criteria introduced in <Table 1>. The second and third mountain ranges were classified by their continuance with the first mountain range. With regard to mountain ranges that reach a certain length, they were classified as independent mountain ranges, which were not connected with the first, second, and third mountain ranges.
Table 1> Classification Criteria of Mountain Range System

<table>
<thead>
<tr>
<th>Mt. range system</th>
<th>Classification criteria</th>
<th>Feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st Mt. range</td>
<td>The highest and longest mountain range in the Korean peninsula</td>
<td>The main mountain range stretching from Baekdu Mt. to Jiri Mt.</td>
</tr>
<tr>
<td>2nd Mt. range</td>
<td>The mountain range directly connected with the 1st mountain range</td>
<td>Very significant in terms of topographical development and approach methods</td>
</tr>
<tr>
<td>3rd Mt. range</td>
<td>The mountain range directly connected with the 2nd mountain range and indirectly with the 1st mountain range</td>
<td>Though its size and length are not notable, it is connected with the 1st mountain range through the 2nd mountain range.</td>
</tr>
<tr>
<td>Independent Mt. range</td>
<td>The mountain range with no connectivity to any other mountain range</td>
<td>The mountain range that reaches a certain length is considered as independent mountain range, although it is not connected with the first mountain range.</td>
</tr>
</tbody>
</table>

In this study, as shown in <Figure 2>, twenty two of the second type mountain ranges, twenty four of the third type mountain ranges and three independent mountain ranges were introduced, as well as the main Korean mountain ranges, from the mountain Baekdu to the mountain Jiri.

The new mountain range system introduced in this study looks quite different from the three mountain range systems, which have been insisted upon until now: the mountain range system in the current public school textbook; the Baekdudaegan system in Sangyeongpyo and the mountain range system of North Korea. However, after analyzing the new mountain range map in detail, it was found that the map was very close to the mountain range system in the Daedong Yeojido(Daedong grand map).
With the result of this study, it is concluded that a further study should be conducted for the purpose of performing more concrete investigation of a mountain range system and naming mountain ranges suitable for Korean people's emotions.
This research aims at suggesting national strategies for creating cyber national territory toward the ubiquitous world. In this research, the ubiquitous world is defined as a world where all the communications of ‘person to person (P2P)’, ‘person to things (P2T)’, ‘things to things (T2T)’ would be able to be unrestricted with perfect freedom in the future, as shown in <figure 1>. The ubiquitous world enables ubiquitous service in ubiquitous space. To realize it, digital and intelligent territory should come first. Intelligent territory means that micro computer chips are put into all geographic features in the real world so that they can collect and transmit information to the computer system. On the other hand, digital territory means that all geographic features in the real world are digitalized so that they can be presented in the computer system. Thus the vision of ubiquitous world is to realize unrestricted communication between people and our physical world and to improve quality of human life.

Cyber national territory is the dynamic second territory of Korea not only to manage the land systematically and deal with administrative services for the people in aspect of public sector, but also to contain economic activities of corporations and the citizens’ everyday lives in aspect of private sector, in a virtual reality made by digitizing various facilities and buildings as well as the entire territory including ground, underground and even the sea. Thus, it is a new social information infrastructure that will be a second territory in the future. The notion of cyber national territory can be divided into three: narrow, broad, and comprehensive. Cyber national territory in the narrow view point only includes natural features such as mountain, river, soil, and so on. On the other hand,
cyber national territory in the broad viewpoint also covers artificial features such as building, road, and facility in addition to the natural features. Finally, cyber national territory in the comprehensive viewpoint means a cyber nation. It includes human activities and policies in cyber territory. This research mainly focuses on the broad viewpoint of cyber national territory.

In this regards, this research conducted a case study. It selected a small portion of city and rural town and built cyber territory for those areas. Selected areas are 1km² of Teheran road area in Samsung-Dong, Gangnam-Gu, Seoul and 6km² of Sintanjin-Dong, Daejeon. The purpose of case study is twofold. First, it attempts to identify possible problems and find technological implications. Second, it aims at drawing policy implications from the prototype. The results of case study show that Korea has ability to build cyber national territory and even can lead to build cyber global village.

The visions of creating cyber national territory are as follows. First, it pursues new digital world that integrates space, time, and man, i.e. STM. Second, it leads to build cyber global village. Third, it fosters the advancement of new information technologies. Fourth, it provides arena for new type of culture and civilization. Fifth, it yields space for all kind of digital activities. Sixth, it creates the second territory that provides
simulation environment.

The strategies of creating such cyber national territory are presented below. First, provide environment in which analog and digital activities can coexist. Second, pursue an transformation to real time territory. Third, improve related law and policy. Fourth, strengthen public relations and support development of new technologies. It will take approximately 10 years and 9,500 billion won to complete cyber national territory.

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Strategies for Implementing GIS-based Local E-government

전자지방정부 구현을 위한 GIS활용방안 연구

Byong-Nam Choe, Jong-Yeol Lee, Mi-Jeong Kim, Dong-Han Kim

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Since the mid 1990's, governments around the world have been implementing various e-government strategies. Korean government has also propelled to build e-government since late 1990's. In fact, Korean e-government is one of world's best practices according to the UN report in 2001.

However, in the view point of citizen, the Korean e-government has still limited contents and services. Besides, user interface is not so convenient and even difficult for some people. As a result, most people still feel that the e-government is not an effective measure to get government services.

The underlying problem is that there are not enough information and services in the e-government. The e-government portal is a kind of front office. The real contents, such as information and services, come from back office - various databases and information systems in the governments. To make e-government successful, the front office and back
office should be well interlinked. In addition, scope of information and services, should be also broaden.

The research aims at exploring theories and technologies related to e-government, examining trends of e-government development, and suggesting strategies for developing GIS-based local e-government. The research methods include literature review, internet search, field survey, and cooperation with experts in the field of e-government.

In this research, we particularly pay attention to the role of GIS for local e-government. Since many of local government data have spatial components, we believe that GIS would play a crucial role in developing local e-government.

Thus, this research tries to examine how GIS contribute to successful implementation of e-government. It also attempts to build a conceptual model for GIS-based e-government. Then, it suggests policy measures, for instance, the need for framework data and for implementing GIS-based e-government.

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**Research Title**

The title of this research is “Multi-satellite imagery mosaicking technology”.

**Objectives and Significances of Research**

- Objectives of Research
This study aims at developing multi-aerial photo or satellite imagery mosaicking method for terrain analysis of wide area. Specifically, this research is focused on developing optimized mosaicking method with automated seam line setting based on edge extracted from two images and geometric/radiometric correction.

- **Significances of Research**

Recently, aerial photos and high resolution satellite imagery are used for variety application fields. One of the common method to integrate multiple images is image mosaicking. To mosaic multiple images, different sensors are acquired and each image should be ortho-rectified to correct its relief displacement. One of the essential processes to mosaic these images is geometric and radiometric correction of distortions, comes from different sensor's characteristics. In the near future, KOMPSAT-2(1m resolution) will be launched. It is meaningful to develope the multi-satellite imagery mosaicking method in this situation.

**Contents and Scope of Research**

This research is about mosaicking multi-sensor and multi-temporal images. Data sets used in this research are SPOT, KOMPSAT-1, IKONOS satellite imagery and aerial photos(1/20,000 scale). Main research contents and scope are listed as follows.

- Image matching using wavelet transformation
- Automated seam line setting based on edge
- Defining of a mosaicking area
- Radiometric correction of the image
- Data sets: SPOT, KOMPSAT-1, IKONOS, aerial photo(1:20,000 scale), etc.

**Outcomes of Research**

After we developed the automated seam line setting based on edge, we applied to the SPOT panchromatic images and aerial image. As a result of our new algorithm, seam line is constructed by using linear feature which describes rivers, roads, etc.
Recommendations and Consideration

We consider that the automated seam line construction algorithm developed through this research can be applied to high resolution satellite imagery which contains small GSD(ground sample distance) and edge distinct linear feature.

Research Effects

By the advent of high resolution satellite imagery, satellite imagery is making inroad into lots of application fields of aerial photos. In this situation, demands for accurate and efficient processing related to the satellite imagery is now increasing. For the terrain analysis of wide area, image mosaicking is essential. Accurate and efficient mosaicking method can contribute to generate image data that covers wide area. Especially, image data of wide area can be used in variety application fields such as thematic map, land use classification, environmental protection, resource investigation and so on.
and plans to extend it to all local governments nationwide by 2005. Effective application of this project required necessary base technology and rational project proposals. For this, it conducted studies on the model for assessing the fair market prices of real estate, constructed Spatial Data Warehouse for supporting land-policy establishment intellectual properties of land database, and also standardized basemap for land-use planning.

There are two purposes on this study, one is to propose maintenance plan and solutions for the Common-Use Program(CUP) through analyzing problems with the program, and the other is to make the strategy and the guideline for developing Urban Information System based on CUP.

In accordance with these purposes, firstly, this study analyses problems related to system operation and legal circumstances through examining Common-Use Program which have been used in local governments since 2000. The idea of system improvement based on the problem analysis is also proposed. Secondly, this study proposes the linkage of various information systems using in local governments. The subjects of work, data, and level of linkage are considered for the linkage of related systems and this study suggests the relatively specific idea of linkage for the Land Management Information Systems(LMIS) and Architect and Administration Information System(AIS).

To conclude, this study attempts to provide a conceptual framework of Urban
Information System based on CUP for the purpose of convenient and flexible application of the Facility Management System. It is, however, still necessary to discuss about the proposed conceptual framework in detail and make long-term steps in order to complete building of Urban Information System. Therefore, the study should be driven in series and detail based on the result of this study.

2004. 12 / 1 Volumes(Vol. 1. The Study on linkage and convergence of information systems on real estate, p. 259; / Study on Commission / Ministry of Construction and Transportation

The information systems on real estate are ‘Architecture Information System(AIS)’ and ‘Land Management Information System(LMIS)’, etc. These systems were constructed for upgrading administrative productivity and improving services for citizens. Systems cannot use information of each other. They constructed and managed same data in duplicate. Accordingly, they waste a budget and manpower and lower the quality of data. Their users at MOCT and local governments demand the functional improvement which make common use of spatial DB possible and process convergent analysis. The objective of this study is to propose the technical method to use spatial DB commonly and the practical method to link systems.
This study analyzed the systems for linkage and convergence. So, it induced the subject of linkage and convergence. First, the application system to re-develop is application system of ‘AIS’ at local government and the DB must be linked. Second, the data for common use are zoning information, spatial information such as topography and parcel, area and a boundary of buildings. Third, hardware and software for common use are CAD software and GIS engine in LMIS.

This study proposed three goals of linkage and convergence. First, it is to improve the service for citizen epochally. It will realize non-stop service for citizen by common use of architecture and land information. It will decrease supplemented documents. Second, it is to innovate the administrative affairs. It will realize on-time and on-site administrative affairs by on-line between central and local governments. Third, it is to make and implement a timely and scientific policy. It will gather the raw data based on spatial data on real time. It will realize the many analyzing methods by GIS. And this study proposed three strategies for practice. First, we must construct the convergent infrastructure based on spatial data at local government. It will service and communize the various information demanded by citizens and officials. Second, we must make the horizontal and vertical information network. The horizontal network is the linkage of administrative branches and the vertical network is the linkage of central and local governments. Third, we must amend the related regulations and establish the unitary organization for construction.

The system architecture for linkage and convergence must be composited for common use of architecture and land information. The information system at local government must have logical convergence and they at MOCT must have physical convergence.

The best method for common use of database is re-designed by standardizing existing systems. In existing and operating system, common use of data utilizes mapping table and in developing system after this, common use of data utilizes standardization. For this, it must utilize the unique-identified number base on location, standardized zoning code and automatic system for linkage of data.
The improvement of functions must be promoted by three steps according to environmental change of technique. The ‘support system on real estate policy’ at MOCT must be constructed convergent system of SDW in LMIS and SDW in AIS. It must be made by any officials in local government to access by using technique based on web. And web portal must be constructed well for offering tailored information to every citizen by Internet.

The operation and management of convergent system is to make a plan, and install systems in whole country and manage them. The process of making plan will be accomplished by internal manpower. And the process of installing and management will be accomplished by outsourcing. In the short term, it is organized by Real Estate Information Team consisting of existing members. In the long term, it must be established by the unitary organization by each division.

The legal basis of convergent system is ‘national land use information system’ clause of ‘the national land planning and use act’. In the long term, we must make the unique act. The regulations about the processes must include that the result is effective. We must improve the form and standardize the data such as design map. We must make ‘the guideline for management of convergent system’ composited by system management,
install environment, security, hardware, software and network. And the regulations about
office organization should be amended for establishment and operation of the unitary
organization.

A real estate price index tracks the price of a standard unit of housing over time. The
index typically is estimated from observations on the sale price and characteristics of a
sample of house sales. There are two critical elements in constructing an index. First, in
Korea, the index is usually made based on the appraised price of a house in stead of
transaction one. Second, attributes of a house vary over space and time, so the index
controls effectively for differences in house characteristics across the sample and allows
a high degree of flexibility in the path of prices over space and time. The estimation of
the housing price index has mainly been studied in a traditional way of the regression
analysis. When spatial and temporal effects are disregarded in the model, however, those
effects lead to distort and mislead parameter estimates and statistical inference.

The purpose of this research is to analyze the spatial and temporal(spatiotemporal)
effect of apartment prices using spatial and temporal dependence of apartments using a
spatiotemporal autoregressive model. As for the data, 225 apartment complexes in the
southern Seoul were selected for the analysis, and their prices from the first quarter of
1994 to the fourth quarter of 2003 were analyzed.
In Chapter 2, we review properties of housing market and then hedonic price models. Hedonic analysis has found extensive utility in the study of urban housing price index. Within the theoretical framework provided by Rosen(1974), the hedonic price function is the market clearing function produced by the interaction of bid functions of households and offer functions of suppliers. We can refer to the price of any attribute as the equilibrium marginal(implicit) price of that attribute. Upon the proper functional specification of hedonic price function, the estimated coefficients will provide the estimated marginal prices of attributes. An important consideration regarding the functional specification of hedonic price model is how spatial(or locational) and temporal effects, positive or negative externalities, are capitalized into housing price. We also review the methods of calculating housing price index and empirical cases.

Real estate price evolves over both time and space. To say that the price of a real estate depends on its location and recent market events seems all too obvious. However, the optimal way of incorporating spatial and temporal(spatio-temporal) dependencies into empirically feasible pricing models does not seem quite so obvious. Traditional practice involves regression of sales price on property characteristics and indicator variables from time and location. Unfortunately, this typically requires the inclusion of more variables in the models than desired on the basis of parsimony to yield residuals without visible temporal and spatial dependencies.

In Chapter 3, to better capture the effect of both spatial and temporal information on real estate prices, while overcoming some of the problems associated with dummy variable models, we introduce a spatio-temporal model that uses information from nearby, recently sold properties in predicting the value of a given property. We follow a filtering or transformation approach to improve estimation. Specifically, we filter the data for the temporal effects followed by filtering for the spatial effects, vice versa or combine the two approaches. Ideally, simple models applied to the filtered(transformed) data should not display the gross error dependencies found with the original data. The filtering approach leads to models with both temporal and spatial lags. In stead of assuming that each region has its own effect modeled by a separate parameter as with the dummy
variable-based models, the spatiotemporal models assume that nearby properties have the same relation to the observations across the entire sample. These spatio-temporal models essentially generalize conventional hedonic regressions. This approach leads naturally to a more parsimonious description of the data than the dummy variable approach.

We build the general autoregressive process and specify the spatial and temporal weight matrices. We use maximum likelihood estimation to estimate the spatio-temporal autoregressive model and then create spatio-temporal real estate price index.

In Chapter 4, we use 8,822 spatio-temporal observations on apartment price in the southern Seoul from the first quarter of 1994 to the fourth quarter of 2003. We demonstrate the substantial benefits obtained by modeling the spatial as well as the temporal dependence of the data. Applying the filtering approach to apartment data, resulted in large improvements in estimation. Specifically, the spatiotemporal autoregression with thirteen variables reduced root mean squares error (RMSE) by 71.6% relative to a dummy variable-based model with twenty-nine variables. The R² went from 0.7941 using the traditional model to 0.9834 using the spatiotemporal model. In addition to strong statistical performance, spatiotemporal models provide other advantages. For example, since the estimated model provides a price surface that evolves over time, we can construct indices over time for any given location or location surfaces at any given point in time. The use of the spatial lags (based on previous sales) means that the relative premium or discount at any given location relative to the overall market changes over time depending on the sales of nearby properties. Hence, we can construct a temporal index for any given location. Also, we can construct a map of locational premia or discounts for any given time.

In Chapter 5, we conclude this research. In a standard parametric hedonic analysis of housing, temporal effects are captured through multiple dummy variables or high-order polynomial in time. We conclude the large improvements to goodness of fit and the reduction in observed correlation among residuals of the spatio-temporal model relative to the traditional dummy variable-based model earns it a place in the panoply of real estate statistical methods, especially since the computational difficulty of the
A real estate price index tracks the price of a standard unit of housing over time. The index typically is estimated from observations on the sale price and characteristics of a sample of house sales. There are two critical elements in constructing an index. First, in Korea, the index is usually made based on the appraised price of a house instead of transaction one. Second, attributes of a house vary over space and time, so the index controls effectively for differences in house characteristics across the sample and allows a high degree of flexibility in the path of prices over space and time.

The estimation of the housing price index has mainly been studied in a traditional way of the regression analysis. When spatial and temporal effects are disregarded in the model, however, those effects lead to distort and mislead parameter estimates and statistical inference.

The purpose of this research is to analyze the spatial and temporal(spatio-temporal) effect of apartment prices using spatial and temporal dependence of apartments using a spatio-temporal autoregressive model. As for the data, 431 apartment complexes in the southern Seoul were selected for the analysis, and their prices from the third week of July, 2004 to the fourth week of November, 2004 were analyzed.
In Chapter 2, we survey literature reviews for the prediction of real estate prices.

In Chapter 3, to capture the effect of both spatial and temporal information on real estate prices better while overcoming some of the problems associated with dummy variable models, we introduce a spatio-temporal model that uses information from nearby, recently sold properties in predicting the value of a given property. We follow a filtering or transformation approach to improve estimation. Specifically, we filter the data for the temporal effects followed by filtering for the spatial effects, vice versa or combine the two approaches. Ideally, simple models applied to the filtered(transformed) data should not display the gross error dependencies found with the original data. The filtering approach leads to models with both temporal and spatial lags. Instead of assuming that each region has its own effect, modeled by a separate parameter as with the dummy variable-based models, the spatio-temporal models assume that nearby properties have the same relation to the observations across the entire sample. These spatio-temporal models essentially generalize conventional hedonic regressions. This approach leads naturally to a more parsimonious description of the data than the dummy variable approach.

We build the general autoregressive process and specify the spatial and temporal weight matrices. We use maximum likelihood estimation to estimate the spatio-temporal autoregressive model and then create spatio-temporal real estate price index.

In Chapter 4, we use 32,721 spatio-temporal observations on apartment price in the southern Seoul from the third week of July, 2004 to the fourth week of November, 2004. We demonstrate the substantial benefits obtained by modeling the spatial as well as the temporal dependence of the data. Applying the filtering approach to the apartment data, resulted in large improvements in estimation. Specifically, the spatio-temporal autoregression with eighteen variables reduced root mean squares error(RMSE) by 11.6% relative to a dummy variable-based model with twenty-one variables. The R² went from 0.8079 using the traditional model to 0.9741 using the spatio-temporal model. In addition, to strengthen statistical performance, spatio-temporal models provide other advantages. For example, since the estimated model provides a price surface that evolves over time, we can construct indices over time for any given location or location surfaces at any
given point in time. The use of the spatial lags (based on previous sales) means that the relative premium or discount at any given location relative to the overall market changes over time depending on the sales of nearby properties. Hence, we can predict future sale price index for any given location of our interest. Also, we can construct a map of locational premia or discounts for any given time.

In Chapter 5, we conclude this research. In a standard parametric hedonic analysis of housing, temporal effects are captured through multiple dummy variables or high-order polynomial in time. We conclude the large improvements to goodness of fit and the reduction in observed correlation among residuals of the spatio-temporal model, related to the traditional dummy variable-based model which earns it a place in the panoply of real estate statistical methods. Especially, since the computational difficulty of the spatio-temporal estimates has not appeared, large and the spatio-temporal model provides other benefits such as location-specific indices and future indices.
projects including the national geographic information system projects since the middle of 1990s, but it is difficult to formulate national policy and to solve current pending problems with national geographic information, which is actually dispersed to individual projects.

This study aims to define national geographic information policy to suggest a mid-long term model of the National Geographic Information System (NGIS) along with strategies and plans to promote this system. And the ultimate purpose of this study is to suggest the vision and policy issues on the National Geographic Information System in Korea.

Main contents and results of each chapter are explained as follows.

Chapter 1 describes backgrounds, purposes, scope and methodology of this study. This study is to propose vision and policy issues for the NGIS establishment.

Chapter 2 is to describe the current transition information technology on geographic information. Adapting ubiquitous computing, national geographic information is needed diverse spatial information computerization, application, distribution.

Chapter 3 is to describe the current situation and problems of national geographic information. The Second national geographic information plan consists of 47 projects including national level. For the purpose of third NGIS plan, diverse problems suggested on spatial information computerization, application, distribution.

Chapter 4 conducts an analysis of national geographic information demand, which is surveyed into 2 parts. According to the analysis results, the digital integrated land shows the highest demand. These results will be applied to the priority list for developing national geographic information.

Chapter 5 suggests the NGIS vision and policy issues. In order to construct the Integrated Digital Territory in the 21st Century, the currently promoted project for the national geographic information construction needs to be more developed. In this regard, it is necessary to implement National Spatial Data Infrastructure, enhancing the usability of NGIS, creating the cyber-geospace.

Chapter 6 is a conclusion, which summarizes the vision and policy issues, and indicates the limitations of the research.
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