SPACE AND ENVIRONMENT

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KOREA REFORMS NATIONAL TERRITORIAL PLANNING LAWS

Background

The parliament passed a bill in December 2001 to make substantial changes to the use, management and development of the national territory. According to the bill, the government declared the enactment of " Act on the Planning and Utilization of the National Territory "in February 2002, and its subordinate regulations are scheduled to take shape by the end of this year. When the new act is put in force from January 2003, it will guide overall matters concerned with the national territory together with the " Framework Act on the National Territory. "Thereupon, the three laws that have governed national territorial matters such as " Act on Comprehensive Plans for Construction in the National Territory, " " Act on the Utilization and Management of the National Territory, "and " Urban Planning Act "will be abolished.

The rationale behind the enactment of the new act is to protect the national territory from reckless development. Many efforts have been made so far. The 4th Comprehensive National Territorial Plan (CNTP), which is long-term guidelines pertaining to the use, management and development of the national territory for the period of 2000-2020, sets forth a national territorial management scheme to harmonize development with environmental conservation. The CNTP also suggests that a " plan first, development later system "be established. The government issued comprehensive measures to prevent reckless development in May 2000 and formed a " National Territory Readjustment Planning Team "composed of experts and government officials to work on regulatory provisions, in which the KRIHS played a central role.

The " Framework Act on the National Territory " pertains to the regular evaluation and investigation of national territorial plans, the unification of national territorial planning laws and the linkage of sectoral plans in pursuit of the enhancement of the feasibility of national territorial plans. The " Act on the Utilization and Management of the National Territory, " and " Urban Planning Act "were integrated into the newly enacted " Act on the Planning and Utilization of the National Territory. "The new act controls various land use activities. In particular, it prescribes detailed planning of city and county regions, the reform of zoning system and activity restrictions by zoning, land suitability assessment, the acquisition of development permits, development in conjunction with infrastructure provision, and the 2nd-type detailed district planning. These new institutions are considered proper alternatives to remedy problems in the national territorial management such as difficulties in managing non-urban areas in planned manner, the complexity of zoning system and spatial planning laws and the prevalence of special laws in land development.

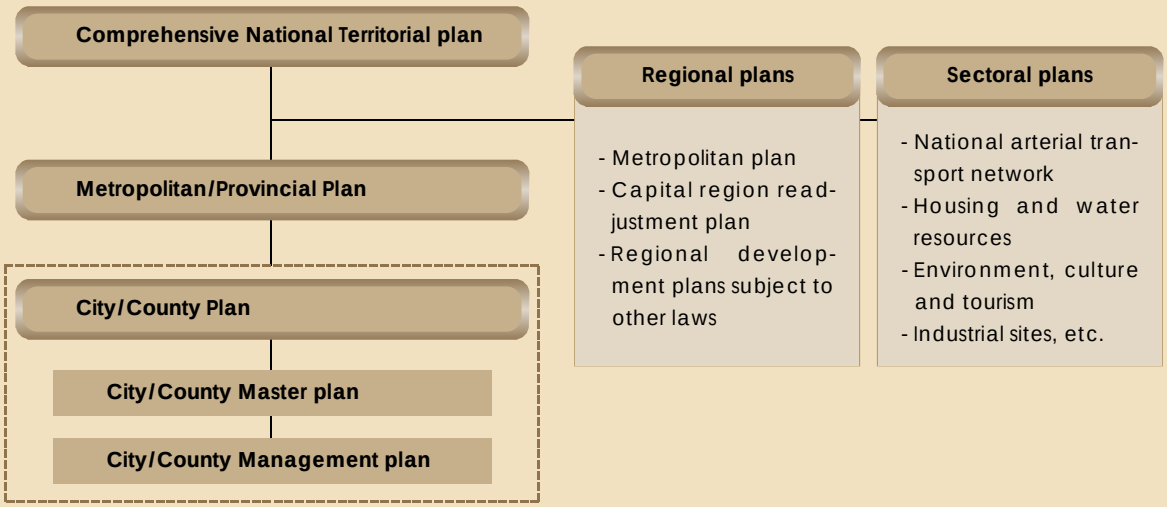
Major Changes

As schematized in the following figure, the " Framework Act on the National Territory "and the " Act on the Planning and Utilization of the National Territory "align national territorial planning laws in the hierarchical order of Comprehensive National Territorial Plan, Metropolitan/Provincial Plan, and City/County Plan. Accordingly, every city or county should have its own city plan or county plan covering the whole areas in its jurisdiction but in the frameworks of the Comprehensive National Territorial Plan and the Metropolitan/Provincial Plan. Areas

that need inter-regional management should establish a metropolitan plan. Various region-specific land use plans and sectoral plans that lack in interconnection and consistency should also accord with these national territorial planning laws.

The City/County Plan consists of a master plan and a management plan. The former concerns the basic spatial structure and long-term development schemes of a city or a county. It mandates the establishment of development density control plans for each living zone in consideration of developable land, and redevelopment and reconstruction demands. As guidelines to the City/County Management Plan, it also provides criteria to designate areas for detailed planning and areas in which developers should bear the responsibility for infrastructure, either by investing in infrastructure or by paying charges for their use of public-invested infrastructure. The feasibility of the plan should be reinvestigated every 5 years to renew the plan. All district plans on land use, transportation, the environment, etc. should conform to the City /County Master Plan.

Meanwhile, the latter can be characterized as an action plan similar to urban plans now in force. It decides the kinds of land use and the layout of infrastructure facilities. The City/County Management Plan is effective for 10 years and is to be renewed every 5 years. The degree of detailing the City/County Management Plan should be differentiated between urban areas and non-urban areas. However, City/County Management Plans for those areas where planned development is expected, for example, areas subject to the 2nd-type detailed district planning, should be as detailed as that for urban areas. On the other hand, metropolitan plans mainly concern the linkage between two or more cities or counties in terms of spatial structures, functions and inter-regional facilities. As it is a comprehensive plan and at the same time, a sectoral plan, a metropolitan plan for each inter-regional facility can be established separately, for example, a metropolitan plan for sewerage, a metropolitan plan for waste treatment facility, and so forth.



<Hierarchy of national territorial planning laws>

Metropolises, cities and counties in the capital region and their neighboring cities that have a large development demand should establish their own City/County Plan by 2005 and the rest of cities and counties by 2007.

1. Zoning and district systems

The present " Act on the Utilization and Management of the National Territory "classifies the national territory into 5 zoning areas such as urban area, quasi-urban area, quasi-agricultural & forest area, agricultural & forest area and natural environment preservation area. The new act, however, reshuffled them into 4 zonings such as urban area, management area, agricultural & forest area and natural environment preservation area and once again subdivided them into 9 categories such as residential area, com-

mercial area, industrial area, green space area, agricultural & forest area, natural environment preservation area, preservation management area, production management area, and planned management area. The first 6 categories are the same as conventional ones but the latter 3 categories are newly created ones. The preservation management area is designated to protect the natural environment and green space and prevent water pollution. The production management area is designated in those areas where systemic management is necessary to facilitate production activities in the industries of agriculture, forestry and fishery. The planned management area is designated to intend planned development and phased land use for the future urban use.

The district system will also go through substantial changes. Regulations on landscape, altitude, fire prevention, disaster prevention, facility protection, and settlement areas, which apply to urban areas at present, will expand to the whole nation for rational land use. In addition, settlement areas, industrial promotion districts, and facility site districts which are usually designated to develop non-urban areas, and development promotion districts by the " Urban Planning Act " will be integrated into development promotion districts.

2. Activity restrictions by zoning

Current activity restrictions by zoning will be altered. The upper limit of floor-to-area ratio will be lowered from 700% to 500% for residential areas and from 200% to 100% for green space areas. In agricultural & forest areas that are allowed to have high-density development according to the " Building Act " but no density control by zoning laws, the upper limit of building-to-land ratio will be lowered from current 60% to 20% and that of floor-to-area ratio from 400% to 80%. The building-to-land ratio of natural environment preservation areas will be also adjusted from current 40% to 20% at maximum. Meanwhile, the building-to-land ratio and floor-to-area ratio for the newly introduced management areas will be in the ranges of 20-40% and 80-100%, respectively. In addition, the current negative-list activity restrictions will be changed to the positive-list activity restrictions.

3. 2nd-type detailed planning area

The 2nd-type detailed planning system is introduced to protect management areas and development promotion districts from small-scale, sporadic development causing the lack of infrastructure and environmental degradation. The present detailed planning, which is to be called the 1st-type detailed planning with the introduction of the 2nd-type detailed planning, has limitations to manage non-urban areas in the face of various development demands such as housing, commerce, logistics, tourism and leisure.

The 2nd-type detailed planning area (or district) is demarcated in size of 300,000m^2 for housing sites and 30,000m^2 or more for other land uses by taking into account the degree of development pressure and the purpose of development. These areas will be developed in systemic and planned manner by establishing a phased management plan and collectivizing development activities. The siting of infrastructure such as roads, schools and hospitals, public service utilities, land blocking, floor-to-area ratio, building-to-land ratio, upper and lower limits of building height, and traffic management will be controlled in these areas. In addition, the standards of infrastructure provision in these areas will be differentiated by the purpose of land use such as housing, industry,

Upper limits of the building-to-land ratio and the floor-to-area ratio by zoning

Zonings	Building-to-land ratio (%)	Floor-to-area ratio (%)
Residential area	70	500
Commercial area	90	1,500
Industrial area	70	400
Green space area	20	100
Preservation management area	20	80
Production management area	20	80
Planned management area	40	100
Agricultural & forest area	20	80
Natural environment preservation area	20	80

tourism, leisure, special facilities, and combined.

To nourish detailed planning, incentives will be offered such as relieving activity restrictions, elevating the upper limits of floor-to-area ratio and building-to-land ratio but excessive high-rise and high-dense development will be restricted.

4. Development in conjunction with infrastructure provision

Overloaded infrastructure resulting from excessive development is impeding a sound urban development. As a solution to this problem, " Development in conjunction with infrastructure provision "is institutionalized whereby to force developers to invest part of their development profits in infrastructure according to the beneficiary-pay principle. This system designates two types of districts: one is districts where developers should be responsible for the provision of infrastructure, either by paying charges for their use of public-invested infrastructure or by providing infrastructure at their cost, and the other is districts in which the development density should be controlled.

The former is designated in green space areas, management areas, and development promotion districts in newly developed areas in which development activities are so concentrated that the lack of infrastructure is expected. It is designated through the investigation of the city (county) planning committee. Areas subject to the 2nd-type detailed planning are deemed to fall into this category.

The latter is designated in residential, commercial and industrial areas in built-up areas that are likely to experience the deficit in infrastructure, particularly in roads, water supply and sewerage facility. The development of built-up areas should be controlled within the capacity of existing infrastructure, for it is difficult to provide additional infrastructure to them. It should be also designated through the investigation of the city (county) planning committee. An idea considered is to lower the upper limit of floor-to-area ratio to 50% of the present floor-to-area ratio for development density-controlled areas.

For those areas in which developers are imposed with the responsibility for the provision of infrastructure, a plan should be established to define the kinds of infrastructure, the total cost, the cost share between developers and time schedule of cost share, financing methods, concerned municipalities ' support, etc. Development activities responsible for infrastructure provision are the alteration of land types for construction activities and construction activity itself. Infrastructure required to be provided with development activities are roads, parks, land secured to make parks, green space, land secured to make green space, and land to site elementary, middle and high schools, water supply facility, sewerage, waste treatment facility, etc. Infrastructure charges are imposed by development activity in consideration of the type of land use and the use of constructed buildings. Local governments may make advance investments in infrastructure through the issuance of local bonds for the areas designated for development in conjunction with infrastructure provision if orderly development is expected in them.

5. Development permit

The zoning and district systems in Korea are based on the building liberalism. Therefore, development projects in discord with higher order plans, the environment and landscape are indiscreetly allowed as far as they are not violating the zoning and district systems. Such practices, however, result in reckless development. As a remedy to this problem, development activities that require a development permit will be defined, for example, building construction, facility installation, the alteration of land type (excluding the alternation of land type resulting from farming), quarrying, land division in urban areas, etc. However, natural disaster relief, emergency measures to control disasters, the new construction, expansion and reconstruction of buildings that require a register and the alteration of land type following them are the exceptions.

Development permits will be issued in three types such as approved, unapproved, and conditionally approved by taking into account the suitability of plans (for construction or development), infrastructure facilities and their sites, danger protection, environmental pollution protection, landscape, etc. Mayor or head of a county decides the permit of small-scale projects in accordance with the criteria provided in the zoning system. On the other hand, head of a county, mayor, provincial governor or the minister of the Ministry of Construction and Transportation are authorized to permit mid-to-large-scale projects based on the result of the investigation by each planning committee at provincial, city, and county levels.

6. Land suitability assessment

The current zonings were designated largely based on the actual conditions of land use and the demand

WHAT IS LAND SUITABILITY ASSESSMENT?

The purpose of the Land Suitability Assessment (LSA) in Korea is to define and classify the use of land according to its physical, social, economic, spatial and geographical elements. It is used as basic data to decide which land to be preserved and which land to be developed. As a developed form of the Farmland Suitability Assessment that was used to evaluate the productivity of farmland with its physical elements such as the type of soil and gradient, the LSA takes into account environmental, social, economic, spatial and geographical elements as well as physical elements. Obtained data in the LSA are utilized for the establishment of land use plans. Korea has employed the LSA with the enactment of the" Act on the Planning and Utilization of the National Territory "in 2001 to achieve a harmony between development and environmental conservation and prevent reckless development in surrounding areas of metropolises.

The LSA is carried out in the following procedures. First, elements reflecting the most of the land suitability of an area are selected among various land suitability assessment elements. It includes physical elements (soil, gradient), spatial elements (distance to developed areas, accessibility to public convenience facilities) and land use in neighboring areas (the ratio of ecological preservation areas to the total area, the diversity of land use). Afterwards, the points and weights of these elements are calculated through the Delphi Technique and the Multi-Criteria Evaluation that is a combination of the Analytic Hierarchical Process and the Fuzzy-Sets Theory. Based on the results of these statistical and non-statistical analyses, land suitability values of each land parcel are calculated and according to it, land is classified into 5 categories. The final decision on the use of the 5 categories whether to be developed, to be used for agriculture or to be ecologically preserved will be made according to policy goals and land use plans of the central and local governments.

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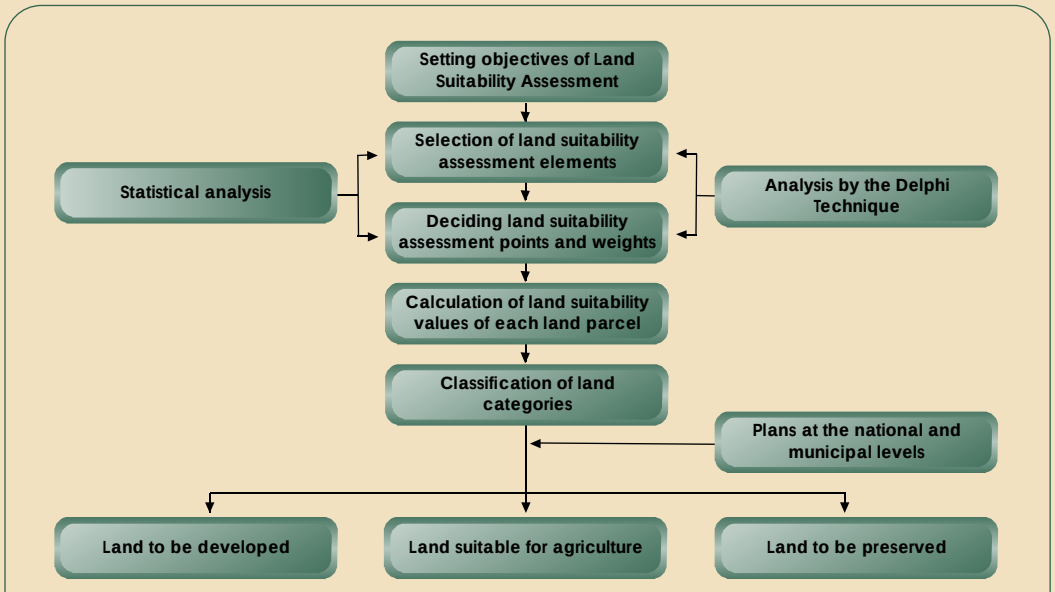

<Land suitability assessment procedures>

of residents but without objective and scientific evaluations on the impact of land use. As a result, a reversion in land use has been caused, that is, places that need to be preserved are developed and places that have development potentials are preserved, and farmland suffers from reckless development. Furthermore, the new act reformed existing quasi-agricultural & forest areas to management areas but it seems necessary to establish objective and rational standards to subdivide management areas to minimize residents ' complaints.

In this context, the land suitability assessment is introduced to manage the national territory in rational manner. It will be used as basic data to distinguish areas to be developed from areas to be preserved. It will also enable to grasp the cultural, social, environmental and geographical features of each land parcel. In addition, the land suitability assessment will be carried out as part of the basic land survey that is carried out for the readjustment of urban management plans. Obtained data will be built into a database to be utilized as basic data for establishing various land use plans for the national territory. Mayor or head of a county is empowered to carry out the land suitability assessment for quasi-agricultural & forest areas, upgraded zoning areas (for example, from green space area to residential area) and areas to be adjusted by urban management plans.

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LINKING SPATIAL DEVELOPMENT PLANS WITH ENVIRONMENTAL PLANS

Korea has made strides in economic development for the last three decades. Economic logic has been dominant in the development of the national territory during the past development decades. Mountains were bisected and rivers were reclaimed. Even housing sites were developed in the middle of farmland without any thought over convenience facilities. In the face of such indiscrete development activities, reckless development has become a social problem. Also, there has been an increasing recognition of the need for environment-friendly and planned use of the national territory.

The government has finally taken the reform of national territorial planning laws. However, it is still doubtful if the new laws will be a panacea to the entire environmental problems. It is evident that they concern more about the environment than the conventional ones but if they do not have practical devices and schemes to control environmental matters from the stage of establishing spatial development plans, they might confine themselves to making only a few improvements to environmental problems. Spatial planning laws, as fundamentally enacted to nurture development, cannot help but have limitations to promote environmental conservation. In this context, it is necessary to insert a set of measures for the environment in land use plans or infrastructure plans, which are integral parts of each spatial development plan.

Three alternatives are considered for the linkage between spatial development plans and environmental plans. The first alternative is to strengthen the linkage between sectoral plans. The second alternative is to strengthen the linkages between spatial development plans and the third one is to establish an environmental plan system equivalent to the existing spatial development plan system.

1. The linkage between sectoral plans

Each spatial development plan such as Comprehensive National Territorial Plan, Metropolitan/Provincial Plan, Regional Development Plan, and City/County Plan consists of sectoral plans on land use, transportation, infrastructure, parks and green space, environmental conservation, etc. Here the problem is that the sectoral environmental plan has no connection to spatial development. In other words, it merely deals with disaster prevention, waste disposal and sewerage but not with environmental deterioration that may be caused by other sectoral plans such as transportation plans or infrastructure plans. Therefore, it is important to link sectoral plans to one another before linking spatial development plans to environmental plans. In this context, the sectoral environmental plan should deal with matters of the natural environment conservation, whereas spatial development plans should pre-

liminarily consider the impact of environmental damages that may originate from development. In addition, the sectoral environmental plan should contain measures to deal with the changes in land cover and inevitable environmental deterioration.

2. The linkage between spatial development plans

Even though it appears that there is a hierarchical order among Comprehensive National Territorial Plan, Metropolitan/Provincial Plan, Regional Development Plan, and City/County Plan, they have no connection in substance and even there is no mechanism to nurture the connection. In other words, there is no legal ground to enforce upper level planning laws on lower level plans. Therefore, it is important to connect spatial development plans from high to lower level plans substantially. One alternative can be to evaluate the degree of connections during the preliminary environmental impact analysis.

3. Environmental plan system

Environmental plans in Korea are categorized into a long-term comprehensive plan for environmental conservation according to the " Framework Act on Environmental Policy "and a framework plan for the conservation of the natural environment according to the " Natural Environment Conservation Act. "The former mainly deals with control of pollutant discharge and the installation and management of environment pollution protection facilities. The latter is possible institutionally but has not been established yet. Therefore, it is no exaggeration to say that there is no environmental plan that comprehensively deals with environmental problems arising from development, for existing environmental plans do not concern the deterioration of the natural environment or the disconnection of ecosystem. At present, a bill for the revision of " Framework Act on Environmental Policy "is pending in parliament. When the bill is passed, the national environment conservation plan will be established and every spatial development plan should be established in consideration of it.

Furthermore, each city and county should have its own natural environment conservation plan as a sectoral plan under the national environment conservation plan. Therefore, it is expected that at least an institutional device to link both of them will be in place. It is also necessary to insert clauses in its enforcement decree to prevent or reduce the deterioration of the natural environment.

In conclusion, future environmental plans should be integrated with spatial plans. Therefore, it is important to institutionalize the establishment of environmental plans by using biotop maps. Biotop maps illustrate ecological features and deliver information necessary for the establishment of spatial plans as well as environmental plans.

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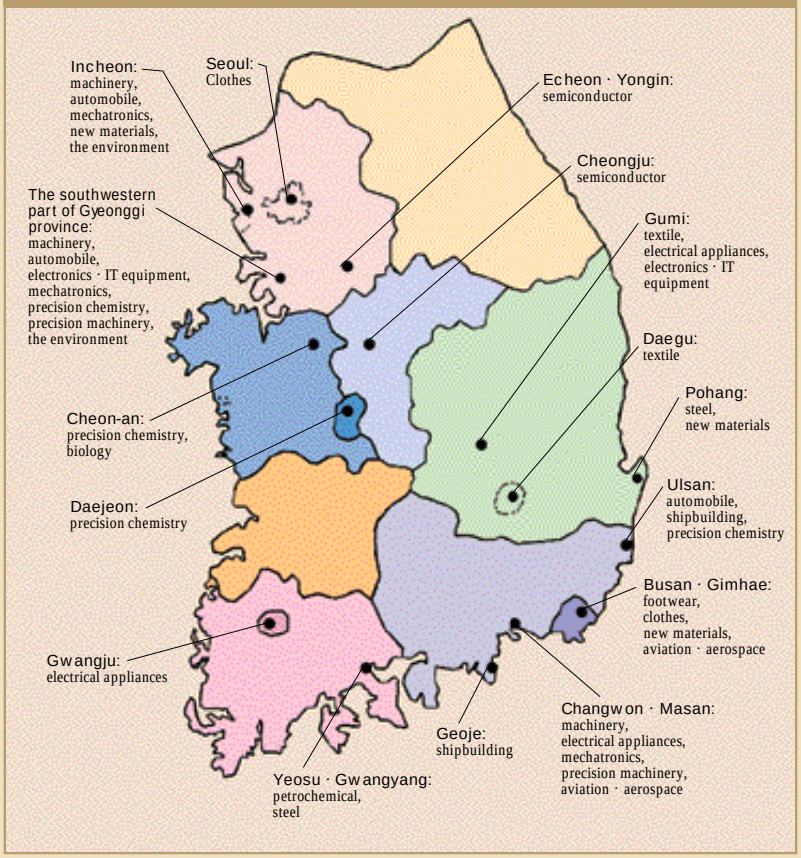
REGIONAL INDUSTRIAL CLUSTERS IN KOREA IN A KNOWLEDGE AND INFORMATION ERA

Regional industrial clusters conventionally mean the agglomerations of firms in a place for the primary purpose of the reduction in transaction costs. Now they are understood not only as the origin of technological innovation and knowledge creation but also as a stepping stone to the enhancement of regional competitiveness. Since Michael Porter asserted in his book, "The Competitive Advantage of Nations "published in 1990 that regional industrial clusters are the origin of national competitiveness, the regional industrial cluster has become an important subject of academic research and government policies. Advanced countries including OECD promote regional industrial clusters. Korea is not an exception. Research on regional industrial clusters is undertaken and the central and local governments are promoting regional industrial clusters to nourish regional industrial development. The KRIHS, in support of the government policy, carried out a study on domestic regional industrial clusters to suggest ways to promote the development of regional industrial clusters. The major features of the study are summarized as follows.

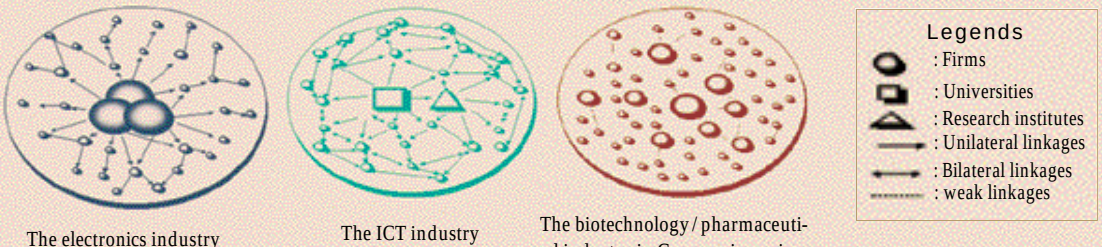
Figure 1 Major regional industrial clusters in Korea



Among the 9 major industries[1] and 9 knowledge-based industries[2] that were selected by the Ministry of Commerce, Industry and Energy in 1999, various types of domestic regional industrial clusters were identified and their forward and backward industrial linkages were analyzed. These clusters were classified into representative industrial cluster, potential industrial cluster and ordinary industrial cluster according to the degree of industrial agglomeration, productivity and growth potential. The analysis on their regional distribution revealed that most industrial clusters in Korea are located on the Seoul-Busan development axis, particularly in those regions where large enterprises are located. Regional industrial clusters identified in the study are footwear and clothing in Busan, textile in Daegu, electric home appliances in Gwangju, precision chemistry in Daejeon, textile, electric home appliances and electronics and telecommunication equipment in Gumi, and steel and new materials in Pohang (Figure 1).

The study identified five factors responsible for the development of industrial clusters such as localization, networking, institutional thickness and embeddedness, collective learning, and innovative synergies. By the permutation of these factors, they are classified into geographical proximi-

Figure 2 Composition of major actors and linkages between them in the three regional industrial clusters



The electronics industry in Gumi

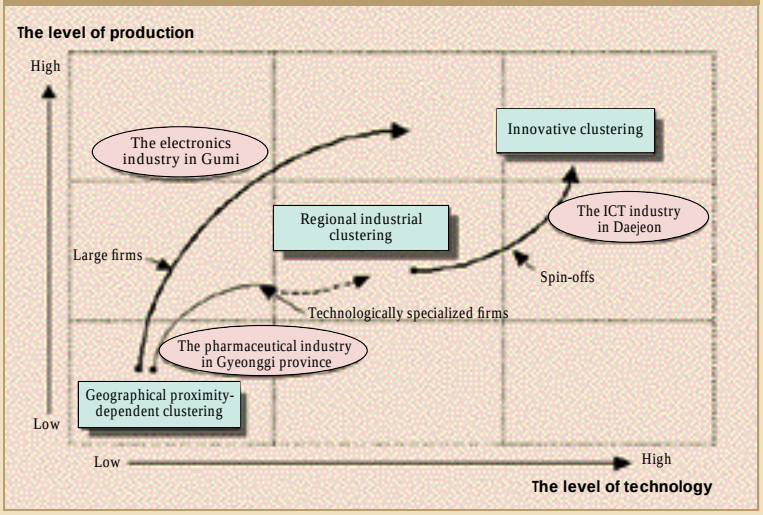
The ICT industry in Daejeon

The biotechnology / pharmaceutical industry in Gyeonggi province

1 Textile, clothes, footware, petrochemical, steel, machinery, electrical home appliances, automobile, and shipbuilding.
2 Electronics · telecommunication equipment, semiconductor, mechatronics, precision chemistry, biology, precision machinery, new materials, the environment, and aerospace.

proximity-dependent clusters. They can develop into a regional industrial cluster when forward and backward linkages are established among firms and supporting institutions and when institutional thickness and embeddedness enable informal and tacit transfers of information and know-how with trust. In the stage of innovative clusters, economic actors in a region create the interactive mechanism of collective learning to acquire innovative technologies and information and exchange technical manpower, going beyond the level of solidarity. In doing so, synergy effects are created to convert potential innovative capabilities to actual profits.

Figure 3 The clustering stages of the three regional industrial clusters



Three domestic regional industrial clusters were selected for case studies: the electronics industry in Gumi; the information and communication technology (ICT) industry in Daejeon; and the biotechnology/pharmaceutical industry in the southern part of Gyeonggi province. The study surveyed 58 firms in Gumi, 137 firms in Daejeon, and 30 firms in the southern part of Gyeonggi province and innovation program supporting organizations such as universities, research institutes, and government agencies.

The composition of major actors and the kinds of their linkages of each of the three regional industrial clusters are illustrated in Figure 2. In the Gumi electronics industry, large firms, as an engine to clustering, are maintaining diverse linkages with small and medium firms but small and medium firms are not linked to one another sufficiently. In the ICT industry of Daejeon, spin-offs from universities and research institutes are actively making linkages among themselves as well as to universities and research institutes. In the biotechnology/pharmaceutical industry in the southern part of Gyeonggi province, many large firms and small and medium firms are agglomerating in this region but networking and cooperation among related firms and institutions are weak. But recently technologically specialized spin-offs from universities, research institutes and pharmaceutical firms increasingly enter into a technical tie-up with pharmaceutical firms with the rise of the biotechnology industry.

The three regional industrial clusters were analyzed in terms of the clustering stage (Figure 3). The electronics industry in Gumi was found to have localized production networks but lack in innovative networks. However, the level of industrial support services was quite high compared to its low level of innovative networking. Therefore, it was judged to stay in the stage of regional industrial clustering beyond the stage of geographical proximity-dependent clustering. The ICT industry in Daejeon was highly evaluated in terms of innovative synergy effects, and institutional thickness and embeddedness. Accordingly, it was judged to be in the stage of innovative clustering beyond the stage of regional industrial clustering. Meanwhile, the biotechnology/pharmaceutical industry in the southern part of Gyeonggi province featured localization of production networks at the inter-regional level stronger than technical support conditions. Therefore, it was judged to be in the transition to the stage of regional industrial clustering from the stage of geographical proximity-dependent clustering.

The study also explores ways for each of the three regional industrial clusters to advance into the stage of innovative cluster. In the Gumi electronics industry, it is necessary to take advantage of agglomerated large firms. Large firms should be encouraged to make consistent efforts on furthering innovation and their research institutes should play a central role in this. In addition, on-the-spot technical solutions should be provided to small and medium firms to help them with technical problems. In the case of the Daejeon ICT industry, small venture firms that are spin-offs from universities and research institutes are major innovative actors. Therefore, strategies to strengthen support systems such as marketing and management consulting services should be designed so that they can perform innovative activities effectively. Lastly, for the biotechnology/pharmaceutical

industry in the southern part of Gyeonggi province, it is necessary to help technically specialized firms establish R&D networks among themselves through program development, the establishment of relevant organizations and industrial support systems rather than nourishing R&D activities among existing pharmaceutical firms.

The study concludes with policy recommendations as follows. First, it is important to take strategic approaches to the development of regional industrial clusters at the national level. Toward this end, mapping patterns of regional industrial clusters and examination of potential industrial clusters should be done first and, based on them, policy directions should be decided. Second, roles of related firms, government agencies and local governments should be clearly defined and networking among these actors should be actively promoted. Third, fragmented support systems operated by different government agencies should be consolidated and relevant regulations should be improved. Finally, it is necessary to differentiate support programs according to cluster types, regions and clustering stages.

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MAKING KOREA AS AN INTERNATIONAL BUSINESS CENTER IN NORTHEAST ASIA

The government has formed the "Planning team for making Korea as an international business center in Northeast Asia" in January 2002, which is composed of regional development experts and government officials. The team submitted a set of proposals to the government in April 2002, which will be publicized during the Worldcup Games for the collection of opinions. The collected opinions will be reflected upon action plans to be prepared by June 2002. After holding seminars and public hearings, the plan will be finalized by December 2002. The summary of the proposals is as follows.

Background

Since China joined the WTO, the formation of an economic block equivalent to the EU and NAFTA is very likely in the Northeast Asian region. It is even more feasible when looking into various trade indices. The increase rate of container freights for the period of 1998-2011 is estimated to be 8.1% per year for Northeast Asia, which is higher than 6.7% per year for the world average. In addition, the ratio of the freight volume within Northeast Asia to the world total has continued to increase from 27% in 1998 to 28.1% in 2000 and is expected to be 30.1% in 2006.

In response to this, Northeast Asian countries are struggling to preoccupy the position of an international business center in the region and ambitiously expanding their logistics facilities to double the capacities within 10 years. China has set about expanding Shanghai Port to increase the harbor accommodations from current 18 wharves to 52 wharves by developing Daxiaoyangshan. Airports are also expanded or newly built in the region to meet the increasing demand of airfreighting high value-added products. Attracting multinational firms is also one of strategies that those countries employ. Nevertheless, between Japan, the world second largest economic country and China, the rising economic powerhouse, Korea is surfacing up as an optimum location for international business and logistics activities.

When Korea becomes a destination of freights and passengers and a location for headquarters of multinational firms in Northeast Asia, it will greatly contribute to the enhancement of the national competitiveness on the whole. In addition, new industries such as knowledge-based, high value-added, and service industries will be generated, which will then work as a new growth engine in replacement of manufacturing industries.

Advantages

Korea has geographical advantages to locate multi-

national firms, for it has a huge market around it. There are 43 cities with a population over 1 million within a 3 hour-flight distance. In particular, it is very close to China, the world ṡ largest potential market. One thing noteworthy is that the market is very likely to expand to Mongolia, Russia, Central Asia, Europe and Japan when the Trans-Siberian Railway and the Trans-Chinese Railway are renovated and connected with Trans-Korean Railway. Korea has made continuous investments in infrastructure such as Incheon Airport, Busan Port, and Gwangyang Port, which are located on one of the world major trunk routes from Kaoshiung to Los Angeles. Its IT infrastructure and high-quality but relatively inexpensive labor are another attractions. Investment conditions are favorable as the mood for reconciliation and cooperation between South and North Korea is deepening and the relationships between Korea, China and Japan are improving.

Disadvantages

Korea has also disadvantages such as small domestic market compared to those of Japan and China, not so attractive living conditions, low level of globalization, and language problem. In particular, unstable labor management relations, lack of transparency in managing firms and the national economy, institutional and non-institutional discriminations of foreigners, inward-looking attitude, the difficulties of building intelligent buildings and international business complexes due to control over the concentration in the capital region are negative factors in attracting multinational firms.

Strategies for making the country a logistics center in Northeast Asia

Firstly, Incheon Airport, which was opened in March 2001, should take advantage of its geographical location to function as a hub airport in Northeast Asia. It has geographical advantages: there are 43 cities with a population over 1 million within a 3-hour flight distance, totaling at a 1 billion population and non-stop flights to Europe and the U.S. are possible.

Secondly, Busan and Gwangyang Ports should be nurtured to be a mega hub port to serve the Northeast Asian region. Located on the trunk route connecting Kaoshiung to Los Angeles, they are suitable for transshipment of freights from the northern part of China and the west coast of Japan. When the disconnected railways between South and North Korea are connected, it will be possible for them to serve as a gateway to Eurasia. They are also competitive in terms of port fees. When assuming that the port fee at Busan port is 100, the port fee of Singapore is 130, Kobe 219, Hong Kong 219, and Kaoshiung 161.

Thirdly, the Trans-Asian Railways, which include South and North Korean railways, the Trans-Siberian railway, the Trans-Chinese railway, the Trans-Manchurian railway and the Trans-Mongolian railway, should be connected to one another, thus to extend to Europe. Incheon Airport should reinforce its shuttle and connecting services to major Northeast Asian cities. On the other hand, it is necessary for Busan and Gwangyang Ports to establish a feeder system with major Northeast Asian ports to attract transshipments.

Finally, legal and institutional adjustment is necessary. Respective hinterland areas of Incheon Airport, Busan Port and Gwangyang Port need to be designated as free customs zones and value-added logistics industries should be promoted beyond simply providing storage and transshipment services. International Logistics Centers should be established to provide one-stop logistics service to foreign firms.

Strategies for making the country a business center in Northeast Asia

Firstly, the regional functions of the western part of the capital region should be reorganized centering upon Incheon Airport. Secondly, phased development in consideration of development priority should be promoted and environment-friendly development methods should be adopted such as the security of green space. Thirdly, financing methods should be prepared to utilize private investments and development profits. Fourthly, special laws should be enacted to facilitate the designation of special economic zones and the establishment of a special administrative organization. Fifth, IT infrastructure should be built to become a Mecca of IT and media industries in Northeast Asia. Sixth, balanced regional development should be promoted through the development of regional centers such as Busan and Gwangyang, and strengthening of the linkages between the capital region and the rest of the country. Seventh, it is necessary to reform existing institutions to create a foreigners-friendly environment. In particular, new laws pertaining to special economic zones are needed to meet the standards of advanced countries.

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Background

FINDING SPATIAL DATA GETS EASIER WITH THE DEVELOPMENT OF A NATIONWIDE GEOGRAPHIC INFORMATION DISSEMINATION NETWORK

The past two decades have seen rapid development in information technology in Korea. As geographic information is widely used in many areas such as territorial planning and urban management, transportation planning, environment management, and emergency responses, just to name a few, the construction of geographic information databases has become an integral part of the Korea ŝ NGIS (National Geographic Information System) project. Since 1995, as a result of continuing efforts to construct large-scale spatial databases as part of the NGIS project, a large amount of digital geographic information has been accumulated.

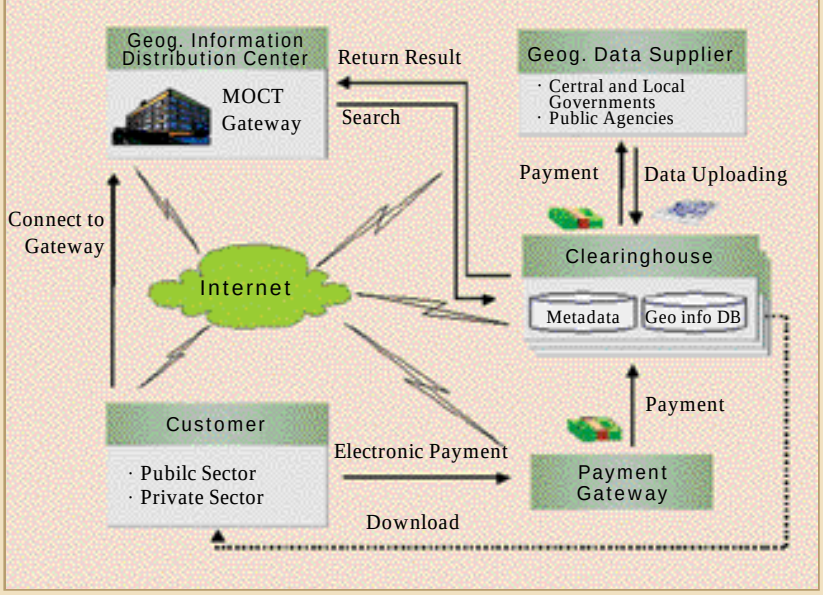
However, due to the lack of a systematic information dissemination network, the data have not been fully catalogued, thus making access to them difficult and redundantly engaging various agencies in producing about the same but slightly different databases. In this context, the need of a nationwide geographic information dissemination network to facilitate the share and distribution of geographic information has been recently recognized.

Developing a nationwide geographic information dissemination network

Four components constitute an information dissemination network: distribution center, spatial data clearinghouse, spatial data supplier and user. The distribution center is an access point (gateway) to all available spatial data. Even though there are various ways to access to specific spatial data depending on system architecture of information dissemination networks, the role of distribution centers or gateways is critical in building any type of information dissemination networks.

The spatial data clearinghouse or clearinghouse nodes has a decentralized system of servers located on the Internet. The servers contain field-level descriptions on digital spatial data, which are called metadata. They are collected in a standard format for easy query and consistent presentation to multiple participating sites. The clearinghouse uses readily available Web technology for the client side, while using the ANSI standard Z39.50 for query, search, and presentation of search results for Web clients. The primary goal of clearinghouses is to provide access to digital spatial data through metadata. The clearinghouse provides a detailed catalog service and supports the links between spatial data and browse graphics.

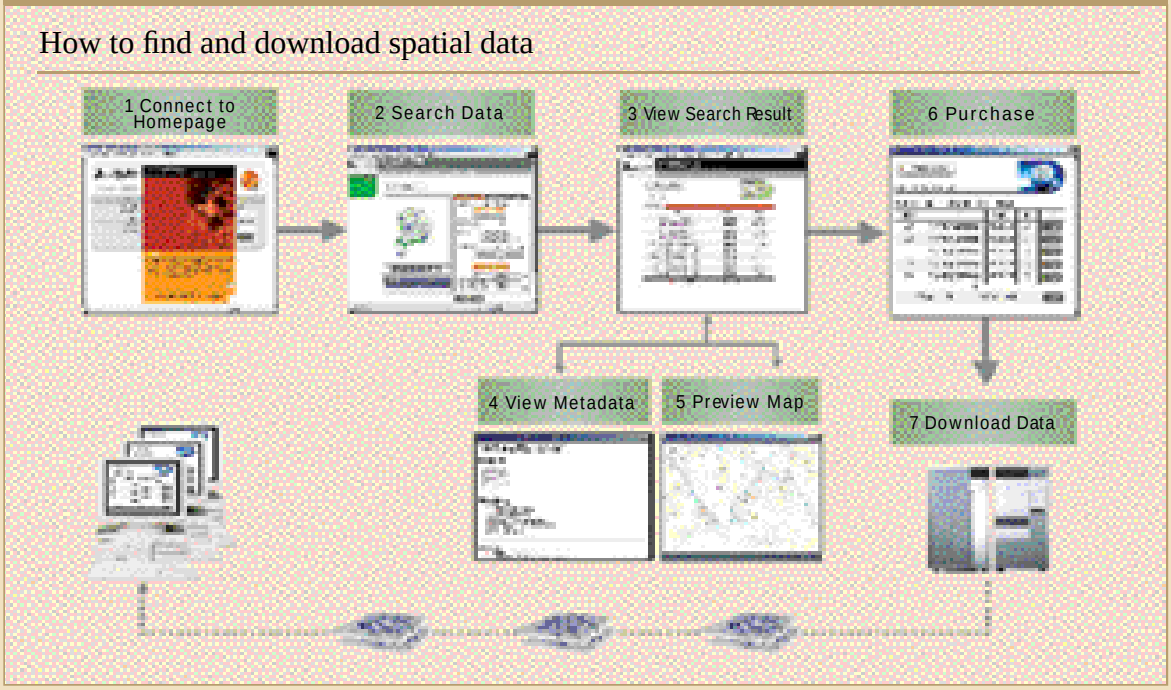
Figure 1 The relationship and flow of information between information dissemination network components



Although it is ideal that individual agencies or data creators directly serve data to users, some of them can not afford to maintain dedicated metadata and data servers to act as a clearinghouse node. In that case, their data can be uploaded in one of the data clearinghouses with which they have a data management agreement. The ultimate responsibility for the spatial data, however, is still with the original data supplier.

Spatial data users or spatial data customers can search data after connecting to a

Figure 2 Spatial data downloading process



gateway, which is a distribution center on the Internet. There are several means that they can use to efficiently search out what they want. For example, customers can use the title of a data set, or administrative names in which the data is included. This is possible through the use of metadata. It is also possible to use a map and zoom-in to narrow down the spatial range to specific data. Once a customer enters a query, he is given a result list and can further narrow down the list and download data he wants. The Figure 1 shows the relationship among these components and the flow of information between them.

Progress of the project

The first phase of the geographic information dissemination network building project began in 2000 under the title of " Demonstration Project for Building a Geographic Information Dissemination Network. " For the project, a distribution center was installed in the NGIS Team of the Ministry of Construction and Transportation (MOCT). In the first phase, a simple network structure is built, since there is no clearinghouse node other than the main server. All data are uploaded in the center ' s main server which is connected to the center ' s Web server. User queries are handled by the Web server which initiates the search of metadata. The result of the metadata search is then presented to the user. The user then clicks data items that he or she needs, which will automatically start the download process from the center ' s main server to the user ' s PC. The Figure 2 shows the process of searching and downloading spatial data. Currently, 13 data sets are available in the system including the Korea ' s national digital base map series at scales of 1/1000 and 1/5000.

Following the successful performance of the demonstration project, the second phase of the project was started in 2001 to be finalized in June 2002. In the second phase, the network structure becomes more decentralized, which means that the central distribution center shares the burden with participating clearinghouses. Three clearinghouses such as the National Geography Institute, the Incheon Metropolitan Government, and the Daegu Metropolitan Government, will be joining in the dissemination network. The number of clearinghouse nodes will increase as the network building process continues. It is expected that the range of spatial data that will be available through the network will be greatly expanded, especially when cadastral and land management data are included in the near future.

Outlook

The network building process will continue until infrastructure for information dissemination is firmly established. The government recognized that the commitment and investment by the government are necessary to change the ways of our lives by means of information technology. When the network is completed, existing spatial data will be better used, which will, in turn, enable to make timely decisions. There are, however, several problems to be tackled. One of them is to create an environment to nurture information distribution. In other words, political and institutional support systems, in particular, policy principles to facilitate the dissemination and utilization of geographic information, must be set up. Based on the principles, laws and regulations pertaining to the pricing of data, copyrights, security concerns and other problems arising from the use of geographic information, need to be reexamined and consolidated.

In addition, continuous efforts should be made on the development of new global standards as well as technologies for geographic information dissemination. It is also necessary to carry out a demand analysis on geographic information to reinforce the contents thereby to raise the service level of dissemination network. The more information is opened to the public, the faster the national vision of " Making geographic information available anytime, anywhere " will be attained.

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TEN-YEAR PLAN FOR PRIVATE PARTICIPATION IN INFRASTRUCTURE (PPI)

The government has formulated the " Ten-Year Plan for Private Participation in Infrastructure " with the objective of inducing the private sector 's participation in infrastructure while maximizing the leverage effect of government subsidies. The Plan will prevent interested parties from investing in already-invested projects by providing them with investment information on candidate projects and enable the private sector to predict the government 's investment policies.

The Plan includes lists of 179 selected candidate projects for private investment during the plan period from 2002 to 2011 in each of the 5 sectors of infrastructure such as road, rail, port, the environment, and other facilities.

The following principles were applied in the selection of candidate projects. First, economically feasible projects were selected through the Benefit to Cost Analysis. Second, projects that were found profitable enough if promoted as a private investment project were selected after each individual feasibility study on the rate of return on investment, the level of effective operation and the subsidy level. Finally, factors such as the impact on regional development and the increase of development demand were also considered.

By these principles, selection criteria reflecting the most of the characteristics of each sector were established and thereby candidate projects were selected. In the road sector, a total of 18 projects, of which total project cost amounted to US$15 billion[1], were selected such as 10 expressways, 4 bypass roads, and 4 local roads. In the railway sector, a total of 15 projects, which would cost US$11 billion in total, were selected such as 3 main network railways, 2 metropolitan railways, 3 urban railways, and 15 light rail transits. In the port sector, a total of 29 projects at the total cost of US$6 billion were selected such as 23 trading ports, 2 fishing ports, 3 waterfront facilities, and 1 combined passenger terminal facility. In the environmental sector, a total of 39 projects, of which total project cost would be US$3 billion were selected such as 51 sewerage treatment plants, 11 incineration facilities, 17 sewage sludge treatment facilities, 8 land-fill gas plants, 1 food waste recycling facility, and 1 refuse-derived fuel facility. In the remaining sectors of infrastructure, a total of 20 projects were selected such as 2 logistics projects, 13 energy projects, and 5 tourist projects, which would cost US$17 billion.

As a whole, the total project cost of the 179 selected private investment projects is estimated to be approximately US$51 billion. The net private investment is estimated to be about US$38 billion when

1 Note: As of May 29, 2002, the exchange rate of US$1 is 1,236 Korean won.

excluding government subsidies. The total project cost of transportation facilities is about US$32 billion, in which US$21 billion of the net private investment is included. The total project cost of environment, tourist, and energy facilities are estimated to be US$19 billion with US$17 billion of net private investment. But when excluding the energy sector that is to be privatized, the net private investment is expected to be US$5 billion.

The Plan will be reexamined every three years for revisions and improvement to respond readily to changes in the PPI market environment and conditions. In order to accomplish the long-term goals of the Plan, it is necessary to draw a clear line between public and private investment projects in terms of roles and responsibilities so that conversion between the two can be made smoothly.

Other ways to facilitate the implementation of PPI projects are the development of transparent and realistic subsidy allocation methods, diversification of selection criteria, promotion of private investment projects, shortening of project implementation periods, improvement of concessionaire selection methods, provision of various forms of guarantees, and customized tariff system.

When the plan is successfully implemented, private investment is expected to flow into the Korea's infrastructure market, which will enable the government to secure fund reserves for underdeveloped areas. At the same time, it will be possible to expand infrastructure with minimal government finance. In addition, the effectiveness of financial allocation will be enhanced through reinforcing the beneficiary-pay principle. Then, within a ten-year period, Korea will take the lead in the market of private investment infrastructure projects.

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NEWS & ANNOUNCEMENTS

KRIHS held a seminar on "OECD Regional Policy on Korea" in the KRIHS conference room on January 10 inviting OECD officials and Korean regional development experts. The participants at the seminar exchanged different views on the "OECD Report on Territorial Policy in Korea" published by the Territorial Development Policy Committee under OECD in December 2001. After the seminar, the Korean participants submitted Korean experts' comments on the Report to the OECD as well as to the Construction and Transportation Ministry.

Northeast Asia Research Team hosted a meeting with Anne-Isabelle Degryse Blateau, UNDP-Korea representative and Sewoo Kim, program manager of UNDP-Korea on February 27 to hear about their current and planned activities on North Korea and the Northeast Asian region. The UNDP, in connection with other UN agencies, has been supporting several Northeast Asia sub-regional programs and promoting the participation of all the countries in these programs and linkages between these sub-regional programs with other Asia-Pacific sub-regional programs. Major sub-regional programs are the Tumen River Area Development Program (TRADP), preparation of strategic action program and transboundary diagnostic analysis for the Tument River Area, its coastal regions and related Northeast Asia environs (TumenNet), reducing environmental stress in the Yellow Sea, international conference on regional cooperation: appraisals and prospects, gender equality through science and technology, regional cooperation in Northeast Asia (GEST) and support to dvelopment of an effective prevention strategy for HIV in Northeast Asian countries (HIV/AIDS).

Seventeen government officials from Bangladesh visited KRIHS as part of administration officials training program on March 21. They had discussions over the national territorial development strategies in Korea with KRIHS researchers.

GIS center invited Prof. Masao Hijikata of Waseda University, Japan for a special lecture on "The information system design for sustainable regional planning" in the KRIHS lecture room on March 28.

Land & Housing Research Division held a joint representatives' meeting of the New National Territorial Research Council on April 6 at Hotel Ramada Renaissance, which is composed of civic groups, research institutes and academic circles to deliberate on national territorial issues. The participants at the

meeting discussed administrative matters of the council and national territorial agenda to be inserted in presidential candidates ' debates scheduled at the end of this year.

KRIHS and Hanoi Architectural University established a sisterhood relationship in research, training and exchange of global studies on April 17. Both parties agreed to jointly carry out projects of theoretical development and practical application in the field of urban and regional planning and other fields of mutual interest.

KRIHS and National Institute for Urban and Rural Planning in Vietnam entered into an academic exchange agreement on April 17 to encourage the exchange of researchers and information, and collaborative research in the urban and regional planning field. It is expected that research program development and research collaboration will become vibrant between the two institutes through this agreement.

National Territorial Planning & Environmental Research Division participated in the second meeting of the West Coast Forum held by a local research institute on May 2, which was titled " Measures to Build up New Industrial Regions on the West Coast to Facilitate Trades with China. "The meeting, which was held on Anmyeon Island located on the west coast of the country, was intended to seek ways to facilitate the development of the west coast regions.

GIS Center held the 4th GIS 2002 Conference from May 22 to 24 at Hotel Seoul Kyoyuk Munhwa Hoekwon under the joint auspices of the Ministry of Construction and Transportation and the Korea Association of Surveying & Geo-spatial Information Industries. Researchers, scholars and people engaged in the GIS industry participated in the conference and discussed the current status and prospects of the GIS industry. The conference was proceeded in 5 sessions including opening ceremony, building spatial databases, the National Geographical Information System policy, application of GIS technologies, and discussion.

KRIHS was awarded the first prize by the Korea Council of Economic and Social Research Institutes (KCESRI) for its excellent research achievements in 2001. The KCESRI was established under the Office of Prime Minister in March 1999 with the enactment of the " Act on the establishment, management and promotion of government-sponsored research institutes. "As a supervisory body to oversee 14 government-supported research institutes involved in the fields of economics and social studies under the Prime Minster, it performs the evaluation of the 14 research institutes every year.

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