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THE CURTAIN WAS RAISED - THE GRAND OPENING OF INCHEON INTERNATIONAL

The Incheon International Airport, a US\$4 billion project (expenditures for the 1st phase construction), has commenced its operation at last since March 29 with the completion of the 1st phase construction started in 1992. Aiming at becoming a hub airport to cover the Northeast Asian region, it was constructed on the reclaimed land of 11.7km² between the Yeongjong Island and Yongyu Island near the Incheon City. When fully developed around 2020, the airport will cover an area of 47.4km². When airline companies concentrate or distribute travelers and freights around a specific airport, the airport is called a hub airport.

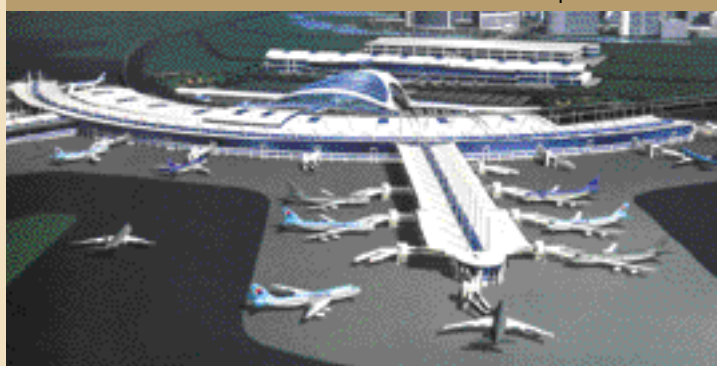
THE RELATIVE POSITION OF THE NEW AIRPORT

Although it is difficult to count how big an effect the Incheon International Airport will have on enhancing the national competitiveness, it is obvious that it will work quite positively. As the table 1 shows, Incheon International Airport has advantages over other airports such as Japan's Kansai Airport, Chek Lap Kok International Airport in Hong Kong, Shanghai Pudong International Airport and Singapore Changi

Airport.

When the second and final phase construction is completed around 2020, the Incheon Airport will rank within the world top ten serving 100 million travelers, 7 million tons of freight and 530,000 flights per year. Its geographic location placed it in the center of the Northeast Asian transportation corridor, where there are 43 cities with population over 1 million within 3-hour flight distance and also allows non-stop flights to the eastern coast of the U.S and major cities in Europe. At present, only Japan's Kansai Airport, Narita Airport and Shanghai Pudong Airport of China provide non-stop flights to the U.S. and Europe. However, Narita airport reached the limits of

Incheon International Airport



1. This article is compiled from the five special contributions to the April 2001 issue of 'Planning and Policy', a monthly publication by KRIHS: 'The formation of Northeast Asian Economic Zones and the role of Incheon International Airport' by Won-Bae Kim, head of Northeast Asia Research Team of KRIHS; 'The effects of opening the new airport on improving competitiveness' by Se-Ho Kim, inspector general of the Ministry of Construction and Transportation; 'The growth of the West Coastal Axis and the status of Incheon International Airport' by Yang-Ho Park, director of National Territorial Planning and Environmental Research Division of KRIHS; 'Measures for economic vitalization in the Incheon City and airport region' by Dong-Hoon Hur, head of Regional Economic Research Team of Incheon Development Institute; 'Measures for reinforcing international logistics functions by connecting airports to seaports' by Il-Soo Jun, vice president of the Korea Transport Institute.

capacity and Shanghai Pudong Airport runs short of demand to such an extent that facility expansion is unthinkable.

It is also expected that the new airport will contribute to attracting many tourists visiting adjacent international tour sites. The passenger terminal in size of 500,000m² boasts the world-class facilities such as hotels, shopping centers, fitness center, international business center and other convenience facilities. The new airport is accessible only by the Yeongjong Grand Bridge and ferry passageway now, but when the second bridge and railway to connect it to the mainland are constructed in 2005 and 2007 respectively, tourism and leisure industries will be boosted in the airport region. Furthermore, the charge for takeoff or landing of an airplane at the Incheon Airport is US\$2,810, which is the lowest in Northeast Asia compared to US\$8,910 for Kansai airport in Japan, US\$4,674 for Chek Lap Kok airport in Hong Kong and US\$5,388 for Shanghai Pudong airport in China. It means that the new airport is in a favorable position to attract foreign airliners.

The 21st century will be an era of logistics. According to technological advancement, the number of compact, high value-added and air-transported products such as semiconductor will increase. In this sense, the new airport is anticipated to contribute to sharpening the competitive edge of Korea in trading by enabling to reach every corner of the world at a convenient time. However, there are two prerequisites for South Korea to root firmly as a logistics center in Northeast Asia: one is that the Northeast Asian region should be placed in the center of multi-national companies' logistics networks and the other, extensive regional networks should be formed encompassing every sub-region in Northeast Asia. The extension of transportation networks in Northeast Asia through port construction in Korea such as Incheon airport, Incheon seaport and Pyeongtaek seaport will offer an impetus to converge people, freight and information upon the Korean Peninsula by making it possible to create new transport services within

Cities within 2-hour flight distance from Incheon International Airport



Northeast Asia. The Korean government enacted in December 1999 'the Law on the Designation and Operation of Free Customs Zones for International Logistics Center' and heralded an enforcement ordinance in March 2000. Presently, Incheon International Airport, Busan Seaport, Gwangyang Seaport and Incheon Seaport have been designated as free customs zones.

The new airport will also contribute to enhancing the overseas competitiveness of Korean construction companies. The know-how acquired in the process of reclaiming the sea to construct an airport will be of help for Korean construction companies to win

orders in overseas markets. The construction of new highway to and from the new airport was also a good chance to accumulate precious experiences. The 4km-long Yeongjong Grand Bridge was built as a world-first three dimensional self-anchored suspension bridge and praised as a splendid achievement in the history of bridge construction.

THE ROLE OF INCHEON AIRPORT IN NORTHEAST ASIA

The Incheon International Airport will play an important role in vitalizing personal traveling in the Northeast Asian region making one-day living space possible. Despite the arrival of internet age, face-to-face contact is still critical in making important decisions at entrepreneurial and national levels. The answer to whether the new airport will enable one-day living space is dependent on how long it will take to move to the downtown area and to go through immigration proceedings rather than flight time itself. If it takes two hours for flying and less than one hour in moving downtown and another one hour in clearing immigration, one may leave Tokyo, Beijing or Shanghai early in the morning to have a business meeting over lunch and return back to Tokyo, Beijing or Shanghai in the afternoon. Therefore, the new airport will allow one-day living space in a practical

sense when the simplification of immigration proceedings and availability of fast and convenient transportation facilities such as highways and railway are guaranteed at a higher level than at the Chek Lap Kok International Airport in Hong Kong. If the new airport satisfies all these conditions, it will greatly contribute to increasing investment, trade and industrial cooperation within Northeast Asia.

IMPLICATIONS OF NEW AIRPORT IN NATIONAL DEVELOPMENT

What does the opening of new airport mean for national territorial structure? The 4th Comprehensive National Territorial Plan over the period from 2000 to 2020 seeks to shape open and integrated national axes that will lead Korea to become the center of interchange in Northeast Asia and at the same time, to achieve balanced development throughout the country. Among the national territorial axes, the West Coastal Axis in which Incheon airport is located encompasses the area along the West Coast Highway, the respective regions where the Ansan-Siheung Highway and Janghang National Railway pass by, and other coastal areas and islands in the western part of Korea. The West Coastal Axis region holds

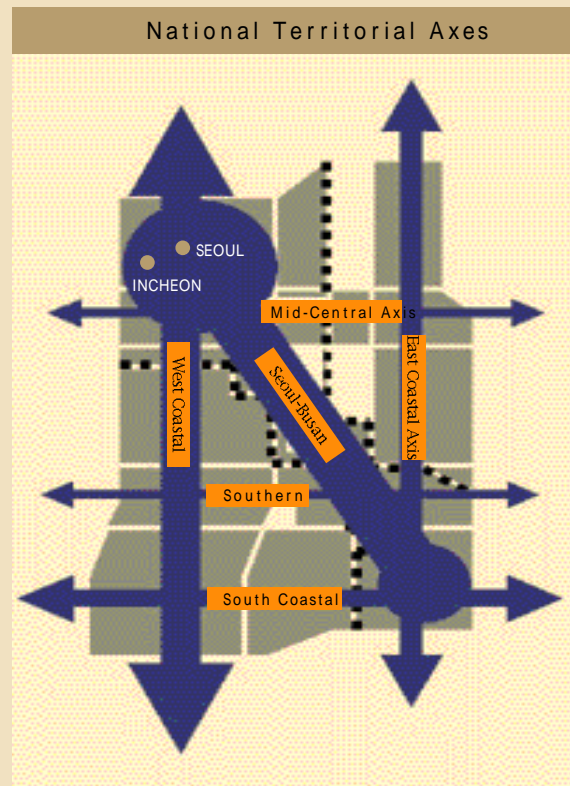


Table 1. The comparison of major airports in Northeast Asia

	Incheon	Kansai	Chek Lap Kok	Pudong
Land area (km ²)	11.7(47.4)	5.1(13)	12.5(14.9)	9.5(32)
No. of runways	2(4)	1(3)	1(2)	1(4)
Passenger terminal (km ²)	0.5(1.1)	0.3(0.6)	0.5(0.9)	0.3(0.8)
Freight terminal (km ²)	0.2(0.8)	0.19	0.3(1.8)	0.3(0.8)
Flight frequency	170,000(530,000)	160,000(260,000)	160,000(320,000)	120,000(320,000)
Passenger handling capacity (persons)	27,000,000 (100,000,000)	25,000,000 (40,000,000)	35,000,000 (87,000,000)	20,000,000 (70,000,000)
Freight handling capacity (tons)*	700,000 (7,000,000)	390,000 (1,750,000)	3,000,000 (9,000,000)	750,000 (5,000,000)
Construction period	1992 - 2000 (2020)	1986 - Sept. 1994	1991 - Apr. 1998	1995 - 2000
Expenditure for airport facilities	US\$4 billion	US\$25 billion	US\$19.9 billion	US\$1.5 billion
The time of opening	March 2001	September 1994	July 1998	October 1999

1) The items marked with an asterisk contain figures per annum

2) The parenthesized figures are estimates for the operation after the completion of the final stage of construction.

about 26 million people, which accounts for 55.7% of the nation's population.

The new airport will provide an impetus for restructuring the Capital Region. Seoul and Incheon areas will be readjusted to fit international exchange belt. For example, Seoul will transform into a political and economic capital, whereas Incheon will grow into an international free city and air transportation hub.

The new airport is also likely to take an important role in promoting economic cooperation between North and South Korea. This is because the Incheon airport will serve North Korean needs for international travel, when the two Koreas make an agreement on inter-Korean traveling.

From an international perspective, connected to China and Eurasia northward and to China and Southeast Asia southward, the new airport region will enjoy synergy effects from the growth of the economic zones surrounding the Yellow Sea, especially the east coastal region of China.

LOOKING AHEAD

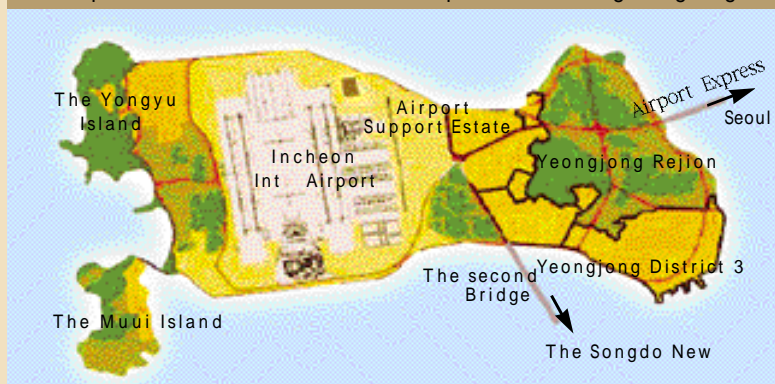
In spite of the failure of baggage handling system and electronic arrival and departure bulletin board in trial operation, the operation of new airport seems successful so far. Nonetheless, there are still obstacles to overcome in order to leap into an air transportation hub in the region. In short term, the new airport should be prepared for a dense fog having less than 200 meters of visibility. Airport authorities reveal that if such cases arise, the Kimpo Airport, which currently serves only domestic lines since the opening of the new airport, will be used as alternative for emergency landing and takeoff. Staff training and management are also important to handle any possible emergency situation smoothly such as the malfunctioning of an integrated information and communication system and accidental flight crash. In longer term, the construction of the second bridge and railway to connect the airport to the mainland should be expedited, which are to be completed by 2005 and 2007 respectively. The Yeongjong Grand Bridge, the only bridge connecting the airport to the mainland at the moment, will not be sufficient to accommodate rapidly increasing

traffic volume. Furthermore, new cities should be constructed around the airport where airport workers can reside. It is also crucial to secure profitability of the new airport. Only 40% of the total construction cost has been financed through the government budget, so the airport needs to raise most of the remaining funds through loans. Lastly, consorted efforts of various actors are essential for the Incheon airport to expand its horizons into the global aviation market.

MASTER PLAN AND DEVELOPMENT STRATEGY FOR THE SURROUNDING AREA (YEONG JONG) OF IIA

Yeong Jong Island is located in the center of the Korean Peninsula on the western coastline, approximately 40km away from Seoul. With the opening of the Incheon International Airport (IIA), Yeongjong will take on a TRI function role viewed from three perspectives, namely from the local Incheon point of view, from a national point of view and from its role as North East Asia's hubbing center. If viewed from an Incheon and national point of view, Yeongjong should be developed as an airport support city, providing functions and facilities that will complement the role and function of the international airport. This should be seen as a short-term vision. If accepted from an East Asia point of view, then Yeongjong should be a Metropolis city, offering

Map of Incheon International Airport and Yeong Jong Region



high tech, value-added facilities and functions including tourism and leisure. This should be targeted as medium term vision. From a foreign investment point of view, Yeongjong should be modeled after an international free city, allowing free flow of trade and foreign investment participation through deregulation of investment policies and systems.

The entire subject site is divided into 5 distinct zones with each zone holding a particular function.

The division is based on the existing urban basic plan with road networks and topography taken into consideration. The functions and facilities proposed are aimed at creating a multi-purpose and self-contained city in harmonization with the operations of the international airport. Additionally, special attention is paid to the preservation of the natural environment to ensure that there is also a balance between the natural environment and real estate development.

THE SIGNIFICANCE OF THE BAEKDUDAEGAN FROM A TERRITORIAL PLANNING PERSPECTIVE

THE CONCEPT OF BAEKDUDAEGAN

The Baekdudaegan, about 1,400km-long mountain ridge consisting of approximately 480 mountains, signifies in the Korean history, culture and ecosystem. From ancient times, all the mountains and hills in Korea are classified into 15 mountain ridges consisting of one Daegan², namely the Baekdudaegan, one Jeonggan and thirteen Jeongmaek³. In literary sense, the Baekdudaegan means the contiguous line of terrestrial stratum from the Baekdu Mountain which is the highest mountain in the northernmost part of the Korean Peninsula to the Jiri Mountain. This concept is associated with the traditional theory of geomancy. High, steep mountains stretching vertically along the Korean Peninsular form the watershed between the east and the west, making cultural differences between them. It had also served as landmarks in ancient times. Even now, it is not too much to say that administrative boundaries of the districts on the Baekdudaegan are identical with the mountain ridge. Even in small number of exceptions, the living

The Cheonwangbong, the highest peak of the Mt.



realms of residents are formed along the mountain ridge. In addition, the Baekdudaegan, mostly covered with forestry, provides settlements to a wide variety of living creatures and is also an origin of all rivers in Korea including the ten largest rivers. Recently, the natural environment of the Baekdudaegan is severely deteriorated

due to massive development such as the east-west road construction, the installation of power-transmission tower, and tourism estate and dam construction.

CULTURAL AND ECOLOGICAL SIGNIFICANCE

The Baekdudaegan affects every aspect of people's living such as regional economy, the creation of a city, cuisine, fashion, architecture, language, agriculture, commerce and meteorology. As all rivers in Korea originate from the Baekdudaegan, the Baekdudaegan may well be considered as a starting place of Korean civilization that had enabled human settlement and developed the life pattern on the Korean Peninsula. Therefore, the Baekdudaegan

2. Literally, it means a large mountain ridge.

3. Jeonggan and Jeongmaek mean secondary and tertiary mountain ridges branching out of the Baekdudaegan. They form the watersheds of Korea.

is the foundation of the national identity that contains history and living culture distinctive to Korea.

The mountain ridge in the east forms steep slopes and is affected by oceanic climate, whereas gradual slopes along the west coast are under the influence of a continental climate. As various species of fauna and flora inhabit the Baekdudaegan, it is, so-called, a treasure house and source of natural habitat. However, no environmental survey, in earnest sense, has been conducted there because there was no official demarcation of the Baekdudaegan and decisions on that to what extent the Baekdudaegan should be managed. In the ecosystem survey in 1990 carried out along the mountain ridge of 680km from the Hyangro Peak to the Jiri Mountain, it was revealed that 1,326 species in 120 botanical families inhabited there. Among them, 109 species indigenous to Korea were growing wild throughout the Baekdudaegan and various kinds of fauna and flora were found growing in colonies such as *Carpinus laxiflora* and *Abies koreana* wils. The surveyors witnessed rare mammals, birds and amphibia, which proved that the Baedudaegan is the last hideout for wild animals to resort to under the situation that poaching for wild animals is prevailing nationwide. It is known that natural monuments or species indigenous to Korea and highly worthwhile preserving such as musk, goats, martens, Eurasian small flying squirrels and Asiatic black bears are living in the Baekdudaegan.

THE NEED FOR MANAGING THE BAEKDU-DAEGAN

Because of ecological importance, the Baekdudaegan is currently managed by several types of preservation zones including seven national parks, two provincial parks, two ecosystem preservation zones to protect important ecosystems, 22 natural forestry preservation zones to keep vegetation growing in colonies and the Sorak Mountain biosphere preservation zone designated by UNESCO. Despite the government has made efforts to protect the Baekdudaegan from deterioration by designating such special zones according to relevant laws, the natural environment has been deteriorating by development projects, mostly by road construction due to its geographical position of passing through the central part of the Korean Peninsula.

In the 1990's when the concept and realities of the Baekdudaegan began to be known, public concerns have been increasing, including the demand that certain areas around the ridges of Baekdudaegan should be preserved. In response, the Ministry of Environ-

ment designated the areas within a horizontal distance of 700 meters from the both banks of the mountain ridge as special management zones in 1997 and required to get approvals for any development or land use. In spite of this, it is pointed out that the efficiency of management and policy adjustment between government bodies are still insufficient due to lack of objective criteria for the designation of special zones. In order to tackle these problems, the Ministry of Environment is carrying out a plan to demarcate a boundary for management taking into account the natural environment and cultural and social features, to develop concrete measures for management, and to prepare for institutional devices.

The Baekdudaegan is the seedbed of the Korean living culture as well as conceptual entity representing Korean's view of geography that has come down from generation to generation. Other than the ecological importance, the fact that the Baekdudaegan symbolizes the unique style of Korean culture that should be refined and inherited to the next generation justifies the need for proper management. The proper management of the Baekdudaegan will ultimately contribute to guaranteeing pleasant living environment by helping the smooth transition of ecosystem all across the Korean Peninsula. It is desirable to consider the geographical, cultural and environmental features of the Baedudaegan in establishing national territorial plans and natural environmental policies so as to make a good use of it, while keeping the original sense of the Baekdudaegan.

<Yeong-Kook Choi, Research Fellow>

The classification of Mountain Ridges based on the old geographical concept



THE GOVERNMENT DECIDED TO CONTINUE THE SAEMANGEUM RECLAMATION PROJECT IN SEVERAL PHASES

OUTLINE

The Water Management Policy Coordination Committee headed by Prime Minister announced to resume the reclamation project in Saemangeum, North Jeolla Province in the manner of environment-friendly, phased development on May 25, which had been suspended for two years due to environmental concerns.

According to the plan, the construction of 33km-dike seawall will be first completed till 2004. Then, efforts to improve the water quality of the Mangyeong River— one of the two rivers in the reclamation site — will be made and at the same time, checking its water condition regularly with its sluice open for a certain period of time. If such efforts prove to work out well, waterproof work will be started in 2006 to reclaim tidelands in the estuary of the Mangyeong River to secure 15,100ha farmland around 2011. In the case of Dongjin River, 99km waterproof work and reclamation work will be completed by 2006 and 2008 respectively to secure 13,200ha of farmland.

The project was initiated in 1991 as a government-run project to turn the tidal flats of 40,100ha in the estuaries of the Mangyeong and Dongjin Rivers into 28,300ha of farmland and 11,800ha of freshwater lake. It was expected to secure 140,000 tones of rice and 100 million tones of water for irrigation yearly from the reclaimed land. At present, more than 58 percent of dike seawall construction was completed and therefore, it must have been very difficult for the government to cancel the entire project after pouring in a vast amount of money. If the project were cancelled, it would also entail economic, social and environmental problems let alone deepening people's distrust of the government's policies. By these reasons and taking into account the fact that mountainous region amounts to 65 percent in the national territory, the government came to decide to proceed with the project in the manner of phased development. It was also designed to

prepare for any possible changes in domestic and overseas circumstances such as food crisis and the reunification of North and South Korea.

The government will spend 1.3 trillion Korean won equivalent to about US\$1 billion from this year till 2011 in expanding basic environment facilities to include sewage facilities in each basin of Mangyeong and Dongjin Rivers, canals to help the inflow from the Geumgang Lake and circulating drainage channels. Reclaimed farmland will be cultivated in environment-friendly methods, and ecological villages, birds' habitats, tourists farms, artificial swamps will be sited there. A tentatively called Saemangeum Environmental Measures Commission and Water Quality Preservation Measures Commission to be instituted in the central government and North Jeolla Province respectively will take necessary steps to systemically resolve critical problems that have arisen in the process of collecting opinions for the last two years.



THE PROGRESSION OF RECLAMATION PROJECT

Before commencing the reclamation project in 1991, the government carried out a feasibility study over a period from 1986 to 1988, and an environmental impact evaluation and deliberate discussions with relevant government organizations during the period from 1987 to 1991.

Nevertheless, in the midst of constructing dike seawall to link Buan to Gunsan-city - two cities encompassing the Saemangeum Area - the government came of a sudden upon an opposition of environmental groups in February 1998. They claimed that the reclamation project would be very likely to be another 'Sihwa Lake' folly, an artificial lake created by a reclamation project that had suffered from serious water pollution due to the influx of wastewater from the neighboring industrial estates.

Most people sympathized with environmentalists and the government also could not neglect environmental concerns because of the failure of the Sihwa reclamation project. So, the government suspended the work in May 1999 accepting the demand of environmental groups and formed a 30-member joint research team consisting of experts, civic group members and government officials.

The research team reinvestigated the feasibility of the project from May 1999 to June 2000 in terms of environmental impact, water quality preservation and economic efficiency through scientific and objective research and evaluations.

The environmental impact division of the joint research team forecasted that the number of edible shellfish such as clam would reduce as well as the

habitats of migratory birds such as snipes and plovers, should tideland is lost because of the Saemangeum reclamation project. They suggested developing technologies to efficiently prevent red tide that is very likely to occur.

The water quality preservation division put into effect the water quality preservation measures tentatively prepared by the Ministry of Environment in pilot scale for the purpose of water quality estimation. According to the result, it was revealed that the average water quality of the Saemangeum Lake would be adequate for irrigation purposes on the premise that the Mangyeong and Dongjin Rivers would meet in a newly formed lake. However, the Mangyeong River recorded 0.12mg/ of T-P (Total Phosphorus), exceeding the limit (less than 0.10mg/) for lakes for agricultural purposes by 0.02mg/ , whereas it satisfied the respective standards of COD (Chemical Oxygen Demand) and DO (Dissolved Oxygen). They opined that it was too early to be pessimistic as there remained more than 10 years ahead before the starting of the earnest use of the Saemangeum lake. For the efficient promotion of water quality preservation measures, they recommended to institute an environmental commission for the water quality preservation in the Saemangeum Lake.

The economic efficiency division analyzed the economic feasibility of the project through an extended benefit/cost analysis. According to the analysis, the ratio of benefit to cost came to 1.25, the internal rate of return to 9.18%, and the present value of net benefit was estimated to be 298.2 billion Korean won equivalent to about US\$229 million, which proves that the project is economically feasible. In the process, questions were raised as to the manner of han-

Table 2. Comparison between the Saemangeum Lake and the Sihwa Lake

	The Saemangeum Lake	The Sihwa Lake
The distribution of areas	Scattered in remote areas from the lake	Concentrated in the surrounding
Pollutants from the lake		
The cycle of the Circulation of lake water	2.5 months	10 months
Total storage quantity	530 million tones	330 million tones
Drainage area ratio (drainage area/lake area)	28.2 times larger than the lake area	7.8 times larger than the lake area
Drainage area	331,900ha	47,650ha
BOD (Biochemical Oxygen Demand) of Flowing-in Rivers	Mangyeong River: 6.8mg/ Dongjin River: 2.9mg/	23.9mg/
Basic environment	Water was contained after installing	Water was contained without fully

ding data such as the value of food security, the effects of the expansion of national territory, the value of tideland, water improvement costs and benefits calculation. There were a few members who argued that the project is not economical as the ratio of benefit to cost ranges from 0.22 to 0.29.

However, the joint research team failed to reach an agreement within them, ending up to submit individual reports to the government. Eighteen members favored the continuation of the project, nine members were opposed and two withheld. Reaching a deadlock, the government attempted to draw a consensus among relevant government organs, residents, environmental NGOs by holding public forums three times and evaluation meetings twice in May 2001 but only to reconfirm the wide gap between each party's stance. Consequently, the government worked out a compromise of environment-friendly, phased development.

CONTROVERSIAL ISSUES OVER THE RECLAMATION PROJECT

The most controversial issue over the reclamation project was whether the new freshwater lake to be created in the process of reclamation could meet the grade D agricultural water standard. Environmentalists and a group of experts did not agree to some portion of the research result of the joint research team, claiming that the amount of floating pollutants was underestimated. They were also negative about the effectiveness of the government's water improvement measures by exemplifying the degradation of water quality in other freshwater lakes. Even the Ministry of Environment worried that it would not be possible to improve the water quality of Mangyeong River to acceptable level let alone the degradation of water quality in the dry season. On the contrary, offi-

cials of the Ministry of Agriculture responsible for this project ascertained that they could improve the COD (Chemical Oxygen Demand) and T-P (Total Phosphorus) to meet 5.5mg/ and 0.103mg/ respectively. For this, they promised to prepare complementary measures for the improvement of water quality to have the Ministry of Environment implement a pilot research to estimate the water quality. They also argued that it would be possible to reach the level of water quality they tried to attain if a phosphorus treatment facility is installed additionally in the mouth of the Mangyeong River in preparation for the dry season.

The Saemangeum project also gave rise to a debate over where to give more importance between tideland and farmland. There were heated debates among academic societies about the analysis of contingent value method to weigh the value of food security and the value of tideland. Both parties confronted with each other intensely in public forums: one party argued that the ecological value was over-evaluated and the other party countered saying that the joint research team underestimated the value of tideland.

The Ministry of Maritime Affairs and Fisheries, environmental groups and a group of experts demanded that the Saemangeum project should not be resumed until scientific investigation is carried out for the controversial issues. They emphasized that the 20,800ha tideland in Saemangeum has high economic and ecological values as various species of oceanic life and rare birds inhabit there.

However, officials of the Ministry of Agriculture argued that the reduction of tideland is unavoidable though, new tideland would reappear in the outside of dike seawall after a certain period of time as witnessed in several reclamation cases home and abroad. In the case of the Isahaya Bay in Japan,

Table 3. The Saemangeum Area Development Plan

		Length	Project Period	Major works
Dike		33 km	- 2004	- Sluice gate for drainage
Dongjin River Basin	Waterproof work	99 km	2004-2006	- Canals to link the Dongjin River to Mangyeong River - One settling reservoir
	Farmland	13,200ha	2005-2008	- Artificial swamp(200ha)
Mangyeong River Basin	Waterproof work	40km	2006-2008	- 28km-circulating drainage channel - One settling Reservoir
	Farmland	15,100ha	2007-2011	- Artificial swamp(400ha)

Depending on the improvement of water quality

reclamation work was done in the newly created tideland nine times from the 1600s until now. The Netherlands had reclaimed new tideland of 6,880ha in the Dollard bay, Groningen until the 1990s since they reclaimed 2,210ha of tideland there in the 1600s. They also added that environmental impacts would be minimized through environment-friendly development and the fact that 1.5meter-wide tideland newly appeared outside the dike seawall justifies their position.

Environmental groups, in particular, filed a sue against the government claiming that the value of tideland should be inherited to the next generations and gave diverse performances in alliance with social, cultural and religious groups in order to publicize the significance of tideland. On the other hand, the government carried out a field investigation in the Netherlands, Germany, Denmark and Japan for fact-finding and collecting information on reclamation projects. After having discussions with the International Commission on Irrigation and Drainage and officials of the Ministry of Agriculture, Forestry and Fisheries, Japan about the needs of reclamation, the government came to a conclusion that the question whether to preserve or develop tideland should be subject to economic, social, geographical and political conditions of a nation.

TASKS AHEAD

It seems that the public in general accepts the government's plan, not as a best choice but as a second best possible under the current situation. However, difficult tasks lie ahead: facing environmentalists' demand to reconsider the government's recent decision, the government has to find ways to accommodate the opposing views, to draw cooperation between central government agencies and North Jeolla Province for the improvement of water quality, to secure the economic efficiency of the expansion of farmland, to accommodate North Jeolla Province's demand for installing a complex industrial estate and secure a vast amount of budget. The government also needs to prepare concrete measures to minimize negative effects along with measures to protect the oceanic environment. A thorough feasibility study in the planning stage will substantially reduce or cut off the possibility of adverse effects and the waste of national resources that may arise due to the controversial nature of the project. It is also recommended to seek ways to promote government-run projects in an efficient and transparent manner.

<Sun Hee Kim, Research Fellow>

KRIHS WORKSHOP ON KOREA-CHINA LAND TRANSPORT CONNECTIONS FOR THE FACILITATION OF ECONOMIC COOPERATION IN NORTHEAST ASIA

As regionalization is getting intensified all over the global village, we are called upon to make more endeavors to strengthen economic cooperation within the Northeast Asian region. For this, many experts argue that the systematization and the enhancement of the efficiency of transport connections will be a prerequisite for vitalizing economic cooperation between Northeast Asian countries. In this context, KRIHS held a workshop titled 'Korea-China Land Transport Connections for the Facilitation of Economic Cooperation in Northeast Asia on April 16. Participants including three Chinese transport experts such as Wang, Huijun of Economics & Planning Research Institute of the Ministry of Railway, China; Jin, Fengjun and Pang, Xiaomin, Institute of Geography, Chinese Academy of Sciences; Zhu, Junfeng, Institute of Comprehensive Transportation, the State Development Planning Commission of China discussed the current transport situations and prospects for the Korean Peninsula and China, and proposed ways for land transport connections through a demand analysis. Introduced herein is an excerpt of the paper by Won-Bae Kim, senior research fellow of KRIHS.

ECONOMIC COOPERATION IN NORTHEAST ASIA AND STRATEGY TO BUILD LAND TRANSPORT LINKAGES BETWEEN CHINA AND THE KOREAN PENINSULA

Won-Bae Kim

Because of the geographical and political situations of Northeast Asia, most cargo movements crossing borders within Northeast Asia are depending on sea transport, whereas passengers travel dominantly by air. The increase of sea transport boosted by Chinese economic growth is remarkable, accounting for more than 20% of increase annually. To cope with this trend, it is critical to systematize and integrate transport systems within the region to connect major sea-ports to hinterland center cities through land transports such as railways and highways.

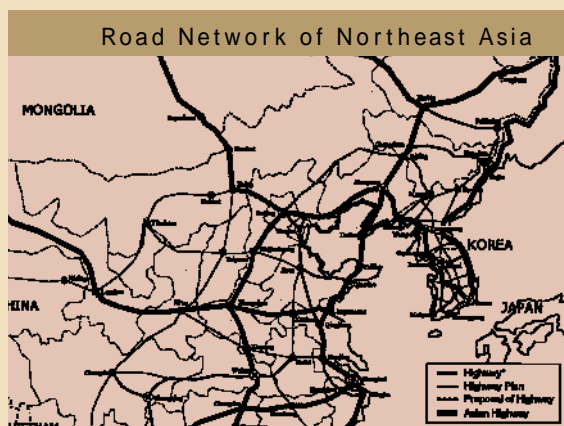
From the macro perspective, Korea-China land connections through transport integration such as the trans-Siberian railroad(TSR) and the trans-China railroad(TCR) will enable trans-continental trade between Asia and Europe while taking advantage of low transport costs. Considering the existing configuration of railway and highway in the primary impact area of Northeast Asia, the key land transport connections between China and Korean Peninsula are transport corridor linking Busan with Shenyang via Seoul and Pyongyang and another transport corridor connecting Mokpo(or Gwangyang) to Changchun (and Harbin) via Rajin and Tumen.

The first corridor can be easily connected to China's major transport corridors such as Dalian-Harbin, Beijing-Shenyang, and Beijing-Shanghai. Rail is operating in the section between Pyongyang and Shenyang(up to Beijing). Highway is going to

open between Shenyang and Dandong by the end of 2002 and therefore is going to enhance the capacity of Shenyang-Dandong section. The Chinese portion does not appear to have any significant problems, whereas the portion in North Korea is known to have substantial problems arising from weak track foundation and single-track. Considering the increase in the freight movement along the Shinuiju-Busan rail, some section in South Korea needs also improvement including the doubling of double-track in the section between Seoul and Chonan. In order for highway to function smoothly, renovation of Pyongyang-Gaesong section and new construction of Anju-Shinuiju section seem necessary.

With respect to the second corridor, the most urgent task is to expand the weak links between Rajin and Hunchun and between Chongjin and Tumen. The Rajin-Hunchun road is used now for the exports from Jilin to South Korea and Japan. In spite of its importance, the road suffers from poor conditions. The railway between Chongjin and Tumen is known to be in need of upgrading. The improvement in these two sections at the border will facilitate trade between China and South Korea as well as between China and Japan since it will enable to link with Tumen-Changchun rail and road in Jilin province and with Manzhouli-Suifenhe rail in Heilongjiang province. Improved rail and road connections in the Tumenjiang area will also relieve the pressure on the overburdened Harbin-Dalian rail. China is making efforts to improve the rail section between Changchun and Tumen, which can be extended to both Zarubino in Russia and Rajin in North Korea. North Korea, however, is not actively engaged in activities to improve transport capacity in this corner of the country because of lack of resources. In the long-term, railway from Rajin can be linked to Seoul via Chulwon. And then this can be easily connected to the existing rail between Seoul and Mokpo.

In addition to these two important transport corridors, we can consider two additional road routes. One is the west coast highway of the Korean Peninsula, which can be connected to the coastal highway from Dandong to Dalian and perhaps to Tianjin in the future. This coastal highway, if connected across



the border, will play an important role for transporting tourists and freight along the Yellow Sea coast. As a matter of fact, highway is under construction between Dalian and Dandong. If new highway is built from Incheon to Shinuiju via Haeju and Nampo in North Korea, the west coast highway will take some burden from the main transport corridor between Busan and Shinuiju.

As South and North Korea, and China are not affluent in financial sources, projects that require a vast investment had better be implemented at a time when the political situation is more stabilized on the Korean Peninsula and financial procurement gets easier. In mid to long term, a masterplan of Korea-China land transport connections should be mapped out. In the short term, the land transport systems that need not so large an investment and are expected to facilitate the movements of passengers and freight

should be expanded and renovated first of all things.

Whatever specific routes and sections are selected, an important task is to form a committee for land transport development among China, North and South Korea. Since it is known that China already made an agreement with North Korea on the double-tracking of Dandong-Pyongyang railroad and the refurbishment of Tumen-Chongjin section, an agreement was also made between South and North Korea for the reconnection of Seoul-Shinuiju railroad. Thus, it appears not difficult to form a triangular cooperation committee on land transport development. The committee, in addition to project development and financing, can discuss various ways and means to remove impediments of border crossing both between China and North Korea and between North and South Korea and to unify signal system, operation time, and other technical matters.

IMPLEMENTATION OF HABITAT AGENDA ON URBAN AND HOUSING ISSUES IN KOREA⁴

The two themes endorsed by the United Nations Center for Human Settlements (Habitat II) held in Istanbul, Turkey in June 1996 were "Adequate shelter for all" and "Sustainable development of human settlements". The Korean government has made continuous efforts to realize these themes. As a result, conditions for settlements concerning habitat such as the security of tenure, access to credit, equal ownership and land use, access to basic services, residential environment, etc. have been greatly improved. Moreover, housing problems have been significantly alleviated with the successful implementation of 'Two Million Housing Units Construction Plan' during the period from 1988 to 1992.

The Korean government laid out a massive production plan to build 5 new towns in the Capital Region, giving the number one priority in shelter policies to expanding housing stock in the late 1980s. Thereupon, the housing supply ratio(housing stock/households) increased from 69.4% in 1988 to 92.4% in 1998. House price also

remained stable since the 1990s. However, the discrepancy of housing consumption and burden of housing cost among classes is widening. The ratio of rental costs to monthly income in the Capital Region went up from 20.8% in 1993 to 26.7% in 1998.

The financial crisis that hit Korea in late 1997 is deemed to have made the most significant effect on habitat policies. Many regulations enforced to prevent speculative investment in real estate were either abolished or mitigated. As a result, the housing market gained greater autonomy. Advanced real estate financing techniques such as asset-backed/mortgage-backed security systems were introduced.

Interest in and support for the neglected of the society are also growing. According to the Livelihood Protection Act that has been enforced during the last 40 years, the minimum cost of living was announced every year. The number of recipients for living expenses was 2 million (4.5% of the total population) in 1993, decreased to 1.41 mil-

4. This brief is based on 「The National Report on the Implementation of the Habitat Agenda」 prepared by the Ministry of Construction and Transportation with support from KRIHS.

lion in 1997 and increased to 1.51 million (3.2% of the total population) in 1998 due to the 1997 financial crisis. The National Basic Livelihood Security Act was provided to replace the Livelihood Protection Act in October 2000 to secure the basic livelihood for the low-income class earning less than the minimum cost of living,

Basic urban services such as water supply, drainage, electricity, telephone services were also improved. In the early 2000 the number of mobile phone service subscribers outnumbered the old-style wire telephone users.

Air pollution in urban areas has been greatly improved with sulfur dioxide levels going down whereas ozone and microscopic dust problems have not been much alleviated mainly due to the increase of automobiles. The water quality in rivers is being gradually improved with the expansion of basic environmental facilities, but the amount of waste is continuously increasing. Envi-

ronmental policy capacities of the central government and local governments have been strengthened to meet people's increasing interest in and demand for participation in administrative procedures. Activities of NGOs(Non Governmental Organizations) are remarkable in quantity and quality. However, environmental policies encounter many bottlenecks such as environmental disputes and NIMBY (Not-In-My-Backyard) syndrome.

There are still many tasks to be dealt with such as evacuees from demolition sites, over-concentration in the Capital Region - 45.5% of total population live in the Capital Region which occupies 11.8% of the total land area, thus causing serious environmental concerns.

The Korean government will continue to make ongoing efforts to ensure that the Habitat Agenda is successfully implemented in Korea by finding solutions to the above problems.

DIRECTIONS FOR THE EFFICIENT UTILIZATION OF INTELLIGENT TRANSPORT SYSTEMS (ITS)

It was estimated that traffic congestion costed the nation about US\$ 13 billion in 1999. When including losses from traffic accidents that are happening four to nine times more than in advanced countries, we are paying astronomical social costs each year for transport. Maybe, enlarging insufficient transport facilities such as roads and railways would be an easy way toward solution. However, when we come to think of vast amount of construction costs, compensation for land use, environmental problems and current difficult economic situation, it seems wiser to seek other cost-effective and feasible alternatives.

One of the fundamental factors underlying the present transport problems is the lack of information exchange between each component of transport systems such as roads, vehicles and users. For instance, if the traffic lights at an intersection operate in a fixed cycle regardless of traffic volume, it cannot fully utilize the intersection capacity. Drivers are

usually trapped in a traffic jam for a considerable length of time without knowing the road conditions. ITS(Intelligent Transport Systems) was developed to fundamentally solve these problems arising from the lack of informatization in the transport sector. It captures ever-changing traffic conditions using state-of-the-art technologies such as electronics, telecommunications and computer science, and controls them in a timely manner. The basic idea of ITS is to make the most of the existing transport facilities.

Before launching upon the construction of ITS, it is important to correctly understand what ITS is. There are still critics who are doubtful if it is right for us to invest in ITS at this point of time. Such a criticism, however, comes from the insufficient understanding of how much benefits ITS will bring with it. For instance, the total cost for building an Advanced Traveler Information System for the Seoul Metropolitan area is estimated to be about

US\$92 million, which is equivalent to the cost for constructing a 9km four-lane national road. The effect of a new national road on improving the traffic conditions would be spatially limited and insignificant at the level of transport axis and network. On the contrary, an Advanced Traveler Information System for the Seoul Metropolitan area will contribute to reducing the traffic congestion in the area 10% at minimum, thus creating a cost saving effect up to US\$538 million annually.

Nonetheless, it would be better to refrain from over-evaluating ITS as if it were a panacea to all transport problems. In other words, the construction of ITS should be promoted step by step in a long-term perspective of 10 years or 20 years to prepare for the coming informatization era in the 21st century. In some areas, it may have visible effects in short term, but in most areas, it may take longer time. It is generally known that ITS can enjoy a synergy effect only when the development of relevant fields keep pace with it such as traffic information collection and analysis system or traffic information provider technology.

It is also necessary to evaluate the effects of ITS from the viewpoint of upgrading the quality of transport services through offering traffic information other than the mitigation of traffic congestion. There would be a big difference between the two situations: one waiting in a car knowing why the road is jammed and how long it will take until the road is normalized and the other waiting helplessly without having any idea on what is happening.

In addition, it is very critical to secure more stable and varied budgetary sources for ITS projects and related R&D projects. At present, advanced countries are struggling to develop the core ITS technologies to preoccupy the ITS market. If things go on like this, the domestic ITS industry may be subordinated by advanced countries, which will result in a great loss in the future. Therefore, it is necessary to establish a budget in a comprehensive manner along with measures to share the expenses among government agencies. Private financing, the Informatization Promotion Fund in the Ministry of Information and Communication, the budget for R&D projects in the Ministry of Science and Technology can be considered budgetary sources.

The integration of ITS is also very urgent. The Ministry of Construction and Transportation is now undertaking various ITS projects such as ATIS

(Advanced Traveler Information System) to cover the Capital Region, Highway Traffic Management System and the construction of advanced transport city models in Daejeon, Jeonju and Jeju. The Ministry of Information and Communication have been promoting an FM-DARC(Data Radio Channel) project and will carry out various ITS-related information and communication R&D projects continuously. The National Police Agency is developing a Traffic Information Service Center, Adaptive Signal Control System and Automatic Enforcement System, whereas the office of Seoul Metropolis plans to develop FTMS (Freeway Traffic Management System) and BIS (Bus Information System). When including the private sector's ITS-related projects, we cannot find easily industries as diversified as the ITS industry in terms of promoters. In order to avoid inefficient system management and overlaps in investment, the Ministry of Construction and Transportation responsible for ITS projects is required to coordinate ITS projects underway and promoters based on the recently established 'the Master Plan 21 for Intelligent Transport Systems' and 'the Transport Efficiency Act'.

Lastly, the importance of the establishment of architecture and standardization activities should not be neglected. It is well known that the ITS built by separate promoters in Japan and some European countries are encountering problems of inter-operability and compatibility. The U.S., which is a late comer in ITS, spent US\$23 million over a period from 1993 to 1996 to complete a system architecture that can be regarded as a pan-national integrated information system of ITS. Based on it, they select demonstration cities to diagnose the feasibility of each project. As such, they are strengthening preparation works in a long-term perspective. Fortunately, Korea has completed an architecture draft to be a basic framework for national ITS promotion and technological standardization. Such works will be the main prop in building efficient ITS and realizing the integration of ITS projects now underway throughout the country. The competition for the standardization of ITS is tough as much as can be referred to as a war without gunshot. However, the ITS standardization of Korea is lagging behind. It is mainly because of insufficient understanding and publicity activities, and immaturity of domestic market, insufficient support for fostering and dispatching specialists, insufficient budget for standardization projects and disorderly allotment of works among government agencies.

The Ministry of Construction and Transportation, the office responsible for ITS projects, can take the

lead to overcome these obstacles. It is empowered to designate a special agency to assume a full charge of ITS standardization according to the recently enacted 'the Transportation Efficiency Act'. The special agency can unify the windows for ITS standardization activities and discuss the division of works among government agencies through continuous deliberations and adjustments. It can also promote R&D projects concerned with ITS standardization along with educating specialists and international

standardization activities so as to strengthen the competitiveness of ITS industry abroad and to prevent technological subordination. In particular, the government will be able to support specialists or responsible government agencies that work for international standardization activities to efficiently cope with the international standardization activities led by the ISO/TC204 (Technical Committee 204).

<Sang-Keon Lee, Research Fellow>

NEWS & ANNOUNCEMENTS

Committee for International Research Cooperation participated in the discussion to map out KRIHS' official positions on the OECD missions and the Korean land policy on February 8 in the KRIHS conference room. Heon-Joo Park, director of Land and Housing Research Division and Sang-Woo Park, senior research fellow of Urban and Regional Planning Research Division also joined the discussion.

Infrastructure & Construction Economics Research Division participated in the workshop, 'Strategies to make the Incheon Metropolis an international logistics center' held by the Center for Transportation System of the Yellow Sea, Inha Univ. on February 22 at the Incheon Songdo Beach Hotel. The workshop was well attended with the participation of President of Incheon Development Institute, President of University of Incheon and relevant government officials of Incheon Metropolis Office and the Maritime Affairs and Fisheries Ministry.

Private Infrastructure Investment Center of Korea held overseas promotional meetings around New York, Chicago and Los Angeles from March 11 to 21 to attract U.S. investors in Korean infrastructural development projects and establish long-term cooperative relationships with them. Thirteen private financing projects on infrastructure including rail and port were publicized at each meeting along with the introduction to the PPI regulations and PPI project situations in Korea.

GIS Center invited two Russian remote sensing experts, Prof. Vladimir F. Tchenkaline, chief photogrammetrist and Victor V. Nekrasov, senior software developer of Sovinformspudnik, Russia to grasp

the details of Russian satellite image processing technologies and the trend of application technology development. The two experts spoke of where they were with satellite image processing technology and the directions of satellite image application and some cases of technological development on March 9 at the KRIHS lecture hall. GIS related people participated in the lecture from National Geography Institute and Korea Geographic Information Industries Cooperative.

Land & Housing Research Division presented on April 2 'The evaluations of national implementation plans for 2000 and plans for 2001' in accordance with the United Nation's Environmental Development Conference Agenda 21 to the Construction and Transportation Ministry. It illustrates the Korean government's policy goals and directions for human settlement and environment for the years of 2000 and 2001. The policy issues addressed in the report are the improvement of the management of human settlement, land use plans suitable for environment and its management, the securing of environmental infrastructure facilities, the development of energy and transportation systems appropriate for the environment, the settlement plans for the areas where accidents occur frequently, and the guarantee of construction activities harmless to the environment.

National Territorial Planning & Environment Research Division of KRIHS and Green Korea United, non-governmental organization in Korea jointly held a symposium on setting up boundaries for the management of the Baekdudaegan on March 26 at the KRIHS lecture hall. The Baekdudaegan, which is in danger of losing its precious ecological value due to massive land development, includes all

the mountains along a 670 km-long stretch of the eastern part of the Korean Peninsula from Mt. Baekdu to Mt. Jiri. Kim, Myung Ja, the Environment Minister gave a congratulatory address followed by the presentation by Yeong-Kook Choi, research fellow of KRIHS. Scholars, researchers of Korea Forest Research Institute, and government officials of the Environment Ministry and Korea Forest Service discussed and exchanged opinions on the efficient ways and potential boundaries for the management of the Baekdudaegan.

Northeast Asia Research Team hosted an international conference on 'Korea-China-Japan Economic Cooperation and the Network of Free Zones in the Yellow Sea Sub-Region' on March 29 and 30 at KRIHS lecture hall. Leading researchers from Japan, Korea and China discussed the benefits and implications of creating a network of free trade zones in the greater Yellow Sea region. Professors Chen Yue and Rao Youling talked about the possibilities and economic effects of setting up a network of free trade zones in the region while KRIHS senior research fellow Won-Bae Kim discussed the need for such an initiative. Zhang Ke, vice president of the Administration of Dalian Free Trade Zone, analyzed the incorporation of China's free trade zones into the Northeast Asian network of free trade zones, while Naoto Takaki, fellow at the Kyushu Economic Research Center, presented a Japanese model for setting up free trade zones.

KRIHS had a training workshop 'Economic Development and Regional Development Strategy for Bangladesh Officials' from April 17 to 29 in collaboration with Korea International Cooperation Agency. This training workshop was designed to provide Korean experiences in economic development and regional development strategy and related policy examples for Bangladesh officials and relevant managing authorities. The curriculum consisted of lectures on assorted subjects such as economic development, national territorial development, industrial

location policy, case studies of new town development, land policies, housing issues and policies, regional development policies, the application of GIS technology and infrastructural development policies, cultural sight-seeing to Sokguram Grotto, Bulguk Temple, Kyongju National Museum and industrial site visits to Hyundai Motor Co., Hyundai Heavy Industries Co., Ltd., POSCO Co., Ltd. and Samsung Electronics Co., Ltd.

Northeast Asia Research Team held a workshop on Korea-China Land Transport Connections for the Facilitation of Economic Cooperation in Northeast Asia from April 16 to 20 in the KRIHS conference room. The workshop was prepared to seek ways for building international transport corridors connecting the Korean Peninsular to China and Russia and tackle obstacles to it such as customs clearance, cost sharing and regulatory impediments. Mr. Wang Huijin of Economics & Planning Research Institute of the Ministry of Railway, China talked about reinforcing cooperation between China and Korea by promoting bilateral economic development, while Prof. Hong, Sungwook of Halla Univ. provided transportation demand estimations between South Korea and Northeast China.

National Territorial Planning & Environmental Research Division has submitted a final report on the commissioned research named 'Bringing the Anyang River back to life' to the Anyang city office on April 4. The Anyang River, 32.64km long, runs northward into the Han River passing through the Anyang city in Gyeonggi Province. Its ecological environment has been severely deteriorated due to rapid industrialization and urbanization. The report suggested a master plan spanning from 2000 to 2010 that contains comprehensive and systemic measures to make it a healthy, safe and pleasant river through the improvement of water quality, the securing of river flow, recovery of river ecology, flood control, spatial adjustment and program development to draw citizens' participation.

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