



SPACE AND ENVIRONMENT

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SPACE & ENVIRONMENT is primarily intended to help foreign experts and professionals in relevant fields understand overall present situations of spatial planning and policy of Korea, and published quarterly by KRIHS.

KRIHS is a government-sponsored research institute founded in 1978 to carry out research on territorial planning and policies of Korea.

The Vision and Strategies of Korea's New Comprehensive National Territorial Plan

The Comprehensive National Territorial Plan(CNTP) is Korea's premier spatial plan, which provides its long-term development directions and strategies in utilizing, developing and preserving its national territory. Specific plans for housing, transport, and marine sectors, established by the central and local governments, should be reconciled with strategies and policy directions presented in the CNTP. Korea set up its first CNTP in 1972 and since then has established its CNTP three times. The New Comprehensive National Territorial Plan for the period of 2011-2020(hereinafter referred to as the new plan) will replace the existing fourth CNTP for the period of 2006-2020. The establishment of the new plan has been driven by a national committee consisting of experts in various fields, centered on the Korea Research Institute for Human Settlements(KRIHS). In the course of establishing the new plan, opinions from experts in various fields were gathered through a series of advisory meetings, workshops and seminars; public views were reflected through public hearings.

Ever since the 4th Comprehensive National Territorial Plan for the period of 2006 through 2020 was established, there have been rapid changes in circumstances surrounding Korea's territory. The 4th CNTP needs to be revised to reflect the following four factors.

Firstly, as climate change and ever-fiercer competition over securing energy sources have emerged as key issues, countries are rushing to embrace the vision of Green Growth. Reduction in greenhouse gas emissions is a priority around the world. Natural disasters such as massive floods and typhoons caused by unpredictable climate patterns have become commonplace all over the world, prompting Korea to build up its defenses against natural disasters. It is against this backdrop that the Korean government introduced Green Growth as its new national vision, calling for a national territory policy strategy.

Secondly, with the spreading G20 structure and FTAs around the world, more emphasis should be placed on strengthening regional and territorial competitiveness. At the same time, there is a need for Korea to build upon the prestige of its national territory to live up to its status as a leading global country and to build a territorial foundation that transcends geographical boundaries. In doing so, Korea can play a leading role in Eurasia and the Pacific region.

Thirdly, it is necessary to establish the foundation of a national territory that better copes with changes in demography, economic and social structures: a decline in population, a rapidly aging society, an increase in demand for quality life and growing importance of cultural values. With advances in high technology and accelerating technology convergence, it is important to form a smart national territory that further promotes and supports such development.

Lastly, large-scale national projects, such as the expansion of transportation networks including the Gyeongbu high-speed railway and the Honam high-speed railway, and the four-river refurbishment plan, should be utilized as a driving force behind the nation's territorial development.

It is from this perspective that the new plan (2011-2020) has been established, replacing the existing

4th CNTP (2006-2020), under the Framework Act on National Territory, which mandates a five-year review of the existing plan.

Vision and Goals

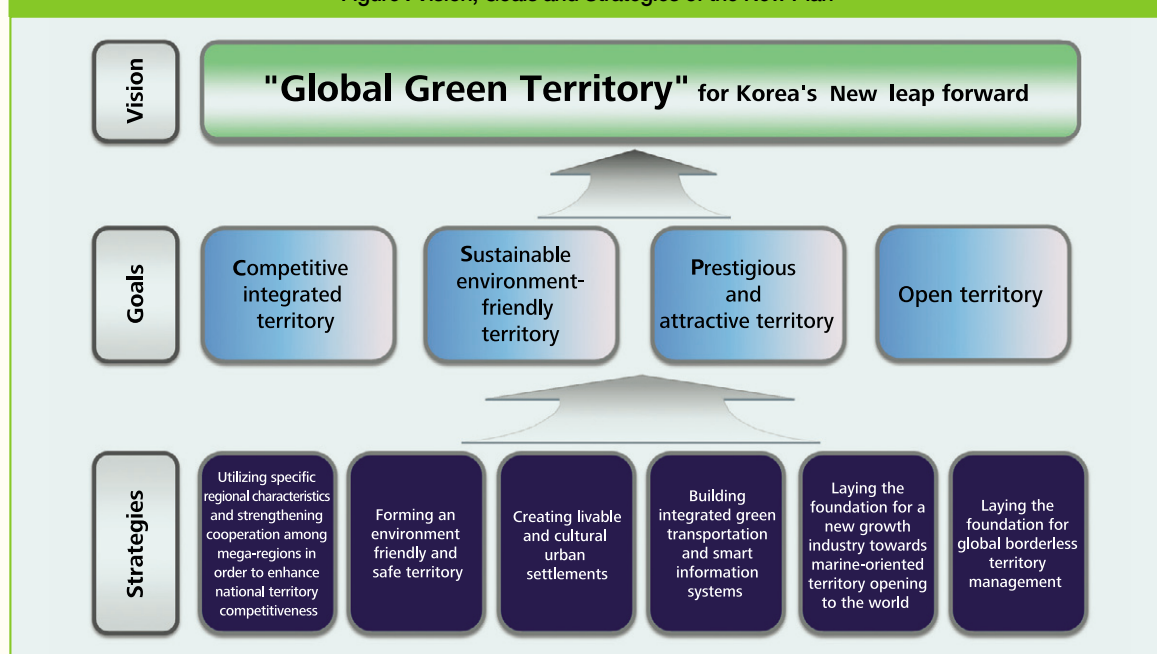
The vision of the new plan is to create a global green territory that will serve as a springboard for Korea's next leap forward. It aims to maximize the geographical advantage of the nation, which is located in the center of Northeast Asia, and to realize an open territory connecting to the Eurasian and Pacific regions. Also, the plan embraces a paradigm shift toward low carbon and green growth across all areas of infrastructure, society and culture.

To realize the vision, the new plan proposes the following four goals.

First, it aims to create a competitive, united national territory. By forming a new national territory framework based on mega-regional units in which multiple regions are integrated, it seeks to promote specialized industries of each region for overall growth. It further seeks to stimulate economic cooperation and reunification between South and North Korea.

Second, it seeks to form a sustainable, environmentally-friendly national territory. By creating a synergy between economic growth and

Figure : Vision, Goals and Strategies of the New Plan



the environment, it will serve as a green growth benchmark, save energy and strengthen the national territory against natural disasters.

Third, it aspires to create a prestigious and attractive national territory. For this, a variety of historical and cultural resources will be preserved and utilized, and settlement environments will be improved in a way to foster high quality of life.

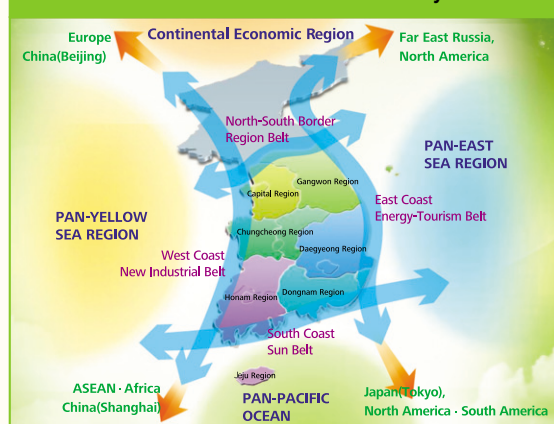
Fourth, it hopes to create a national territory open to the world. To become a global logistic, financial and trade hub, the nation should solidify its role as a gateway to Eurasia and the Pacific by expanding its global footholds.

Directions for Creating a Spatial Structure of the National Territory

To realize the vision of a global green territory, the government plans to form an open territory development axis centered on supra-economic regions that create a foundation for cross-border exchanges and cooperation. To this end, supra-regional belts centered on the four regions of the East, West and South coastal areas and the border areas between South and North Korea will be built. New development axes linking inland and coastal areas will be formulated and the existing Seoul-Busan axis will be remodeled. Domestically, the nation plans to build a spatial structure of national territory as a way to help each region achieve self-sufficiency. This can be done by boosting cooperation and linkage among hub cities centered on 5+2 economic regions. To accomplish this goal, the nation will nurture a city region-which will serve as a growth engine-to act as a global hub for foreign talent and capital. At the same time, to ensure competitiveness of each mega-region, its gateway function will be strengthened and its central cities will be linked with high-speed transportation networks.

Additionally, the nation will build a green territory spatial structure where the emission of greenhouse gases is reduced and natural resources are recycled. To make the endeavor more effective, the following plans will be implemented: establishing low-carbon transport systems, forming an energy-saving spatial structure, restoring river ecosystems, developing the four-river refurbishment project, and promoting green industries.

Figure: Directions for Forming National Territorial Structure: Global Green Territory



Six Strategies for Global Green Territory

To realize the vision and goals of the global green territory strategy, the new plan presents six strategies.

The first strategy will utilize unique characteristics of each region and strengthen cooperation among mega-economic regions to enhance the nation's territorial competitiveness. The plan is as follows: identify and develop specific characteristics of each mega-economic region, nurture supra-economic regions and upgrade quality of life for people living in rural areas, and develop and reorganize industrial complexes to nurture new growth industries. Furthermore, city-regions in which mega cities are linked with their surrounding cities and counties will be formulated. This will spearhead the drive to further develop national and mega-regional economies. Hub cities that serve as new growth engines will be created, bolstering global competitiveness of regions and stimulating more balanced national development.

The second strategy is to create an environmentally friendly and safe national territory. The nation plans to build a comprehensive territory management system for major ecological resources including rivers, mountains and seas. It also plans to establish a comprehensive river management system in which nature and humans can coexist. Scientific management of water resources will keep in mind climate change, strengthening disaster prevention capabilities, and creating sustainable and safe territory and living spaces.

The third strategy is to build cities and residential environments where people can enjoy high-quality and culturally rich lives. Detailed plans include creating Korean-style green and compact cities suitable for the era of green growth, regenerating urban areas and creating attractive cultural spaces. Other plans include improving housing conditions, upgrading housing safety networks, increasing the provision of energy-saving green homes, and reorganizing existing zoning in order to enhance urban competitiveness and flexible utilization.

The fourth strategy is to set up a comprehensive network of green transportation and information. Detailed plans include a low-carbon green growth transportation system focusing on railways, marine transport, alternative automobiles and walking and biking. In particular, the nation plans to build railway networks, make existing roads more effective and smarter, and increase intermodalism. It will also push to become a logistic hub in Northeast Asia, and advance national territory management through high-tech territorial information systems.

The fifth strategy is to build a foundation for new growth and marine-oriented territory. Specific measures include expanding the scope of activities in securing marine resources, strengthening global competitiveness of the marine industry, and comprehensively managing marine resources while taking the ecosystem into consideration.

The sixth strategy is to establish a foundation for cross-border territorial management. The nation should emphasize strengthening the function of the national territory as a global gateway of transport and logistics for Eurasia and the Pacific region. It should explore Korea's global soft territory by putting the G20's development agenda into action, and gradually build a foundation for further advancement in the relationship between South and North Korea.

Measures to Implement and Manage the New Plan

To enhance the effectiveness of national territorial development, a comprehensive system should be reorganized. To this end, the nation plans to reinforce pre-evaluation and post-monitoring of regional development projects. It also plans to shift its regional development approach away from a central government-led approach to a private sector and regional government-led approach. It plans to integrate regional plans and development projects that overlap, decentralize the government system and further increase each regional government's autonomy over its own budget.

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Korea Carves out 'Global Soft Territory'

Decreasing Significance of National Boundaries

In terms of the size of a national territory, Korea ranks 109th in the world, yet it ranks 15th in economic size. In other words, the country's share of the Gross World Product is 1.43%, which is generated from only 0.06% of the earth's surface and a mere 0.71% of the global population. Dr.

Richard Rosecrance, a leading international political economist, asserted in his book titled "The Rise of the Trading State," published in 1990, that states are more likely to improve their welfare by pursuing an economic or trading strategy, not by adopting territorial expansion policies. He added that the models to emulate are Korea, Japan and West Germany.

In particular, the formation of the European

Union represents a Europe that has moved away from the concept of 'hard space' defined by physical boundaries and is now geared toward 'soft space,' wherein individuals and companies organically activate and freely move across all of Europe.

From the global perspective, the world is on track to becoming a single market thanks to the revolutions in transportation and information technology, backed by the advancement of science technology, international movements of global financial capital, and signing of FTAs. Such development decreases the significance of physical boundaries and barriers between nations. In the concept of soft space, any nation could expand its soft territory according to its efforts. Global competition in expanding soft territory is getting fiercer, because strategies for expanding soft territory determine a nation's global competitiveness.

From Aid Recipient to Aid Donor

In January of 2010, the Republic of Korea became a formal member of the Development Assistance Committee(DAC), which is affiliated with the Organization for Economic Cooperation Development(OECD). This marks the first time that a country has transformed itself from an aid recipient to a donor. With its dual perspective, South Korea can play a distinct role as a bridge between donors and recipients of development aid, going beyond simply supporting developing countries with materials. In line with its changed status on the international stage, Korea has increased the volume of its ODA(Official Development Assistance)/GNI (Gross National Income) ratio. Its ODA/GNI ratio increased to 0.13% in 2010 from 0.10%, in 2009, or US\$815million. The nation has pledged to increase its ODA contribution to 0.15% of GNI by 2012 and 0.25% by 2015.

Additionally, at the G20 Seoul Summit, held in Korea in November 2010, the G20 leaders endorsed a development agenda, titled "Seoul Development Consensus for Shared Growth." Initiated by the Republic of Korea, the agenda aims to help low-income and developing countries to build up the capacity needed for achieving practical economic growth. The targeted supporting areas are food and income security, financial inclusion, domestic resource mobilization, infrastructure, trade, human resources development, private investment and job

creation, and knowledge sharing.

To support Korea's government policy for helping developing countries and reaping mutual benefits, the Korea Research Institute for Human Settlements (KRIHS) has drafted a strategy on expanding global soft territory, focusing particularly on infrastructure.

Demand for Spatial Projects of Low-Income and Developing Countries

To identify the demand for spatial projects for low-income and developing countries, a comprehensive analysis has been conducted, using about 120,000 pieces of data from the Economic Development Cooperation Fund of the Korean government, aid projects of Korea International Cooperation Agency(KOICA) and ODA projects in such developed countries as the U.S., Germany, the UK, France and Japan.

EDCF loans(Economic Development Cooperation Fund) extended by the Export-Import Bank of Korea amounted to US\$ 2.3billion for the period of 1989 through 2009. These funds went to 231 projects in the form of non-grant aid in 47 countries including Vietnam, China, Sri Lanka, Indonesia and the Philippines. The categories of aid projects were as follows: road construction(14.3%), school construction(9.1%), telecommunication facilities (9.1%), hospital construction(8.2%), water supply (7.8%), electronic control facilities(6.9%), informatization projects(5.2%), railways(4.3%), airports(3.0%), power plants(2.6%) and health care (2.6%).

As for KOICA, the agency raised US\$ 864 million in aid funds during the period of 1989 through 2009 to provide grants to 491 projects in 69 countries in Asia, Africa and Central America. Informatization-related projects topped the list at 13.1%, followed by social welfare facilities (12.8%), planning advisory and research(10.9%), building schools(10.0%), education and training (9.9%), education(3.7%) and health care(3.5%).

During the period of 1966 through June 2010, Korean construction companies received a total of 9,036 orders from 126 countries, including Saudi Arabia. Plant construction constituted the highest demand with 12.3%, followed by office buildings (12.1%), roads(7.6%), electronic control facilities (6.8%), housing and apartment complexes(5.1%), urban amenities(4.7%), research on transportation

(3.6%), research on urban development(3.5%), power plants(3.5%), gas facilities(3.3%), school construction(2.9%), water supply(2.4%), urban development and management(2.1%) and oil pipeline construction(2.0%).

According to the data on ODA projects conducted in lower-income and developing countries provided by 5 developed countries (the U.S., Germany, the UK, France and Japan) for the period of 1995 through 2008, support for government policies topped the list at 15.1%, followed by educational support(11.1%), health care(7.6%), population /family(6.6%), society/welfare(6.0%), roads(5.7%), agricultural support(4.1%), welfare support(4.0%), water supply (3.7%), finance(2.6%), office buildings(2.3%), power plants(2.3%) and railways (2.2%).

In summarizing the aforementioned analysis based on infrastructure development projects, spatial projects needed for both low-income and developing countries can be grouped into 10 categories: the establishment of spatial planning and its advisory group, urban and rural development, foundation for transportation infrastructure, facilities for urban infrastructure, development of water resources, natural resources for energy, land development, consulting on government policies, research services, education and training on GIS and territorial development.

Realizing Mutual Benefits and Strengthening Linkage of Soft Territory

Exporting Korean-type new town development projects

Korea has achieved a pattern of rapid growth supported by economic development and export-oriented policies since the 1960s. Its dynamic territorial development resulted in the creation of high-quality new towns in a short period of time, drawing attention from the world.

The world population is expected to increase from the current 6.9 billion to 9.2 billion by 2050. Specifically, the world's urban population is expected to grow from 3.5 billion to 6 billion by 2050. If we assume that new cities will host 30% of these expected 2.5 billion people, then we can expect that new cities are needed for 750 million people by 2050. The resulting global construction market of new cities would surpass about US\$ 4 trillion over the next 40 years.

Figure: Korean Firms Joining New Town Projects in Various Regions



For developing countries that want to adopt the Korean prototype of a new town, KOICA will assist them with funds and information-sharing. The exported model of a Korean-style new town should include high-tech IT and green technologies. More importantly, Korea should propose a new town model customized to the development stage of each partner nation. Such a model is a representative soft space model.

Supporting low-income and resource-rich African countries with a localization approach

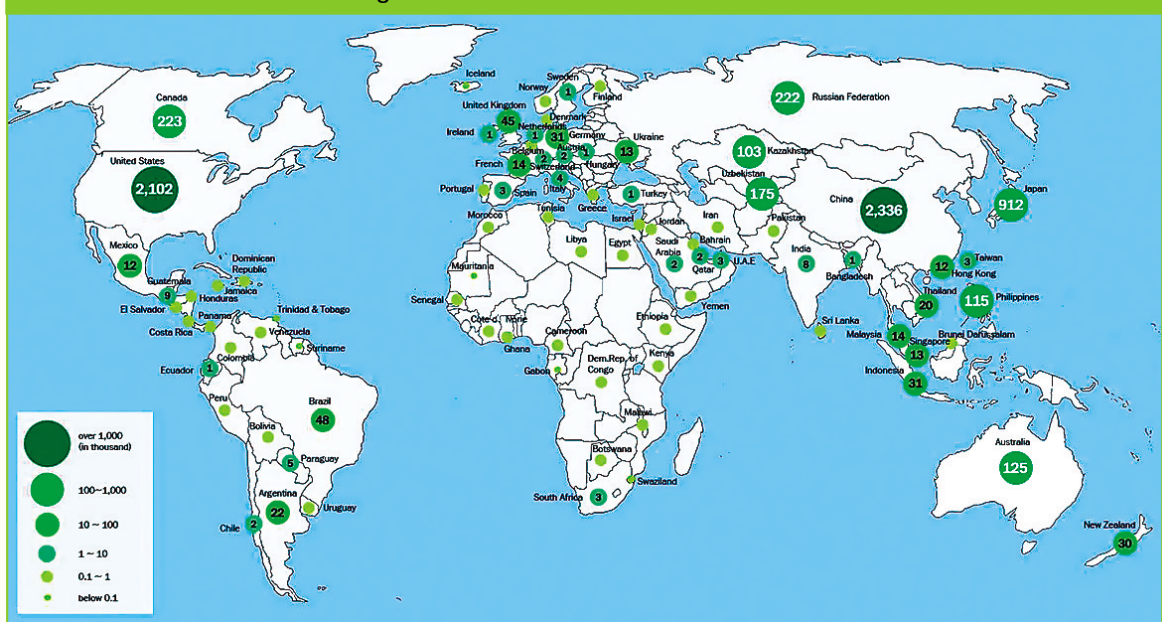
The number of Koreans living in African nations is about 12,000, with around 4,000 living in South Africa and 500 each in Egypt, Nigeria, Libya, Kenya and Ghana. A total of 143 Korean companies are operating in the continent, with the majority doing business in Nigeria, Libya, Algeria, Egypt, and South Africa. Top candidate countries for regional hubs in formulating Korean-style soft space are as follows: Algeria, Libya and Egypt in Northern Africa, the Republic of South Africa in South Africa, Nigeria and Gabon in Western Africa, Kenya in Eastern Africa and Democratic Republic of the Congo situated in Central Africa. Korea can support African countries to develop their infrastructure systems so that they can achieve economic growth as well as territorial development. Korea and its African partners can reap mutual benefits through technology support in such areas as natural resource development. In particular, it is advisable that Korea should invest in the development of housing complexes, an area in which Korea enjoys a comparative advantage. Water management and IT should also be emphasized when developing national territory

Strengthening national territory network with developing counties in Asia

Southeast Asia and Kazakhstan and Uzbekistan in Central Asia would be appropriate regional hubs for Korea to expand its soft space. National territory development networks should be strengthened in these regional hubs, after which the networks can spread to surrounding countries. In particular, countries becoming regional hubs should be prioritized when education training programs are developed or ODA funds are allocated.

Around 950,000 Koreans are living in Central and Latin America. Of these, 480,000 live in Brazil, 220,000 in Argentina, 9,900 in Guatemala and 5,200 in Paraguay. A total of 391 Korean firms are operating in the area, with 139 in Mexico, 94 in Guatemala, 49 in Brazil and 25 in Peru. Notably, some countries in Central and South Americas have FTA relations with Korea. For example, Korea signed a FTA with Peru shortly after its first FTA with Chile. In addition, the nation is in preparation for FTA negotiations with Brazil, Argentina, Paraguay and Uruguay.

Figure: Global Distribution of Ethnic Koreans



selecting potential regional hubs in the area to form Korean soft territory, Brazil, Argentina, Chile, and Venezuela and Columbia in the northern part of the area should be considered first. Particularly, Brazil and Argentina are seeing explosive demand for territorial infrastructure (e.g., high-speed railways). In order to utilize this opportunity for mutual benefits, Korea should adopt a strategic approach that allows it to systematically utilize its relevant knowledge of construction on major territory infrastructure projects in a partner country.

Establishing a center dedicated to education and training on territorial development

A top wish for developing countries is to learn from the nation's accumulated experience and policies on its national territory development over the past half century. In response to this wish, KRIHS in December 2010 opened the Global Development

Partnership Center (GDPC). The GDPC is designed to disseminate and share Korea's experience in territorial development through educating and training programs, in collaboration with international organizations. Training programs include areas such as an establishment of territory plans, regional development, new city development, industry locations, water resource development, building infrastructure, land and housing policies, and geographic information systems (GIS). Additionally, the GDPC aims to support developing countries as they establish their territorial plans. The hope is to link these plans with Korea's investment projects or aid programs to enhance the effectiveness of GDPC support. Ultimately, Korea and developing countries will enjoy mutual benefits.

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Korea's Spatial Restructuring through 'Saemaul Undong'

Following the advent of the new millennium, the world started reflecting on the sea of changes made within the last three or four centuries and bracing for another change with renewed determination. Change herein refers to an effort to pursue "novelty"—namely, a difference from the conventional approach or behavior. However, it also means the process of recovering the dimension or way of life that has been forgotten or lost over time. Korea's Saemaul Undong (New Community Movement), which began in line with the industrialization of the country, is related to this historical context.

Saemaul Undong has been touted as an ingenious local community development model marking a departure from other Western-oriented local community development models and succeeding by mobilizing the full potential of local communities. Of course, Saemaul Undong is evaluated differently

by individual scholars in various disciplines. Nonetheless, the consensus is that the movement was hugely successful in eliminating the then-chronic poverty in farming villages. As such, although scholars may cite different success factors of Saemaul Undong, they more or less agree on popular awareness, incentives for public engagement, the introduction of a new educational system catering to the needs of the times, and leadership stemming from the combination of conviction and ambition.

Such success factors imply that Saemaul Undong is not a one-off initiative, but is adaptable to changes in all circumstances. In the 1970s, industrialization was driving economic growth nationwide in Korea, yet creating an imbalance between urban and rural areas as well as between industrialized and agricultural regions; this in turn led to a variety of issues simultaneously facing urban and rural areas while posing a burden on

government operations. Consequently, the Korean government began to focus on the issues of the rural area while proactively driving industrialization.

Notably, traditional Korean villages built primarily on blood ties made it difficult for the community to recognize common issues and come up with viable solutions, hampering the momentum of national development in the modernization process. Fortunately, Saemaul Undong, which kicked off in 1970, enabled the government to provide materials (Cement 335 Unit) to villages as a unit of space while encouraging villagers to form the necessary assets for common use, contributing to the introduction of “novelty” by converting “blood tie-centric villages” into “communities.”

As the conversion process proceeded, community governance came into being. The conventional spatial structure of the village began to change, serving as a kind of catalyst prompting all villagers to act. As such, Saemaul Undong did not simply focus on the physical dimensions such as the construction of infrastructure, improvement of the living environment, and promotion of income generation platform; it also stimulated community residents to work hard, help themselves, and cooperate with each other, contributing to the creation of a governance structure for community-wide, common prosperity. Ultimately, Saemaul Undong aimed at creating conditions conducive to the restoration of such community.

The assembly of villagers as a decision-making mechanism determining the priorities of Saemaul projects demonstrated how much Saemaul Undong contributed to the creation of a community governance structure and the formation of social capital at the village level. Villagers’ common interest in the spatial structure led to the

accumulation of social capital, improved mutual trust among them, encouraged them to work on issues of common interest actively, networked resident organizations at the level of diverse Saemaul projects, and induced community members to care for one another.

Dating back to 1970 in Korea, Saemaul Undong has been known as a successful example of changing the spatial structure at the village level to create a local community, build a governance structure, and accumulate social capital. However, no positive research studies have examined how Saemaul Undong changed the spatial structure at the village level. Thus, it is important to revisit Saemaul Undong from the perspective of change in the spatial structure of the village.

Against such backdrop, four villages were selected based on the availability of data and accessibility of the geographical location and the changes in spatial elements in terms of point, line, and space in the four villages were analyzed. In addition, all changes in each spatial element were examined, together with empirical studies including analysis on the minutes of community assembly meetings, site visits, consultations with experts and interviews with the then-leaders of Saemaul Undong.

Spirit and Development of Saemaul Undong

Initially, Saemaul Undong began within the same context as “Saemaum Undong (New Spirit Movement).” Born from such context, Saemaul Undong derived its momentum for expansion from the spirit of diligence, self-reliance, and cooperation. The spirit of diligence enables people to accept novelty and seek “better” values. Meanwhile, self-reliance emphasizes self-awareness and self-accountability. Finally, cooperation encourages people to share strengths with each other for co-prosperity.

At the same time, community members grow confident that all of them can benefit from the group synergy transcending the mere sum of individual capabilities. Such a transition is facilitated by combining the three spirits of Saemaul Undong: diligence, self-reliance, and cooperation. Notably, Saemaul Undong evolved into an “initiative to be better off economically” by enhancing the capability of rural community

Figure: River Cleanup Project



Source: Korea Saemaul Undong Center, 2011

residents. As a result, the collective pursuit of a better life followed in Korean society, and group genius contributed to the improvement of efficiency across the entire spectrum of organizations.

Saemaul Undong subsequently developed into a process by which community residents would become more competitive and maintain a mindset more adaptive to new factors as well as a positive attitude to control changes, growing more confident in themselves as physical infrastructures improved to ensure a better life. Thus, the factors behind the success of Saemaul Undong in strengthening local communities' capability and expanding such development can be summarized as follows: Saemaul education, visibility of returns of community initiatives, and arrangement of competition at the village level.

Saemaul education did not just try to infuse new elements; it succeeded in mainstreaming all community members by disseminating the best practices and emphasizing problem resolution via group discussion. In addition, the visible and specific Saemaul projects enabled community residents to observe how the enhancement of their capability translated into tangible benefits, thereby ensuring the sustainability of Saemaul Undong.

Finally, the promotion of competition at the village level and the adoption of a performance-centric reward system served as key elements of the Saemaul Undong governance structure. The Korean government rated each village in terms of the performance of Saemaul Undong as basic, self-reliant, self-sustaining, and welfare villages, differentiating the support accordingly.

Saemaul Undong and the Logic behind the Rearrangement of Villages' Spatial Structure

From the perspective of interaction between human activity and space, changes in spatial elements via Saemaul Undong in the 1970s were examined based on point, line and space.

The rearrangement of villages' spatial structure via Saemaul projects can be understood in terms of points relating to the installation and movement of facilities, expansion, and the extension of line-linking movements as well as the expansion of space. Saemaul projects created significant changes in terms of points such as the construction of new community centers and other income-generation infrastructures(e.g., storages,

workshops, cattle sheds, Saemaul factories).

From the perspective of spatial elements including point, line, and space, the spatial structure of the four reference village was explored. The four reference villages, as well as changes in spatial elements resulting from Saemaul projects, are summarized in the following list:

First, changes in spatial elements of the four villages pertaining to the point were sought by categorizing them into things in common and unique by village. As part of the Saemaul project, Seon-Ri Village changed eight points of spatial elements, including the construction of a village center, the improvement of house roofs, the upgrading of house, the installation of a water supply facility, the rebuilding of fences, the construction of a cattle shed, the improvement of kitchens, and the upgrading of toilets. Deokdeul Village worked on all of these eight points as well as a wash place for community use. Given its proximity to a river, Euri 3 Gu did not include the installation of a water supply facility in the project scope, but added points such as storage and a community factory pertaining to the village's revenue stream. Finally, Yeongyang 1 Ri engaged in relatively simple changes on these points, which included only the construction of a village center, improvement of house roofs, and the digging of a well for community use. Notably, all four villages built village centers, indicating that Saemaul Undong encouraged villagers to communicate with each other more frequently.

Second, changes in spatial elements of the four villages pertaining to the line were broken down into things in common across all the four villages and unique to each other. All four villages built



Figure: Saemaul Undong Training Course

Source: Korea Saemaul Undong Center, 2011

small bridges, maintained streams, paved farming roads, and installed or maintained ditches. The Seon-Ri and Deokdeul villages installed or maintained a water duct while the Yeongyang 1 Ri village built a reservoir for irrigation. As such, changes in the four villages pertaining to line resulting from Saemaul projects revealed some differences subject to the terrain features of each village.

A review of the minutes of resident assembly meetings in relation to Saemaul projects revealed that project priorities were determined in full reflection of the opinion of residents after sufficient discussion. Had this not been the case, Saemaul projects would have suffered resistance and antagonism from some villagers, resulting in conflict from within the villages. Of course, the decision-making process among the residents could have been further expedited in the early days of Saemaul Undong. In other words, in some cases, it may not be fair to say that a generic planning process including the recognition of common issues, the establishment of common objectives, and the exploration of appropriate alternatives was completely followed. Yet this does not mean that some villagers were denied the opportunity to present their opinion.

Third, changes in terms of space resulting from Saemaul Undong in the 1970s were rather insignificant in the four reference villages. In Seon-Ri Village, only a tree nursery was built in support of the reforestation program in 1972; however, Deokdeul Village was relatively more active, pursuing reforestation programs, building a cooperative farm, and purchasing public land jointly. Meanwhile, Euri 3 Gu created a community rice paddy spanning 1.63 acres in 1972. Nonetheless, a review of meeting minutes and other diverse documents showed no superficial change in the Yeongyang 1 Ri village.

The fact that spatial elements in terms of space were not notable in the four villages seems to be an initial feature common to Saemaul projects in the 1970s, suggesting that Saemaul Undong in its early days prioritized points representing the origin of activity and innovation as well as lines linking the activities of villagers. Restructuring efforts based on the comprehensive spatial structure of the community at the village level, such as the village structure improvement project, likely emerged in

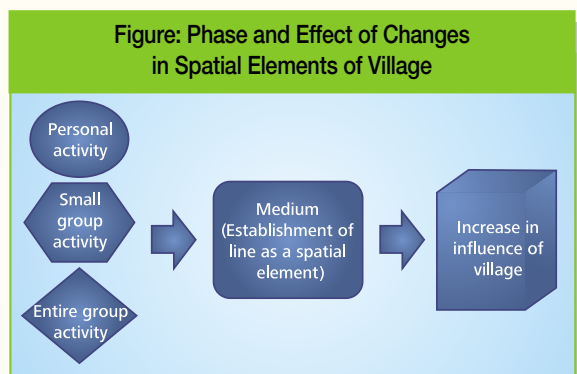
the maturing phase of Saemaul Undong.

In conclusion, changes in spatial elements such as point, line, and shape of the reference villages as part of Saemaul Undong prompted villagers to engage in community activities and propagated their engagement in strengthening the overall influence village-wide. In other words, Saemaul Undong opened, expanded, maintained, or paved in-village roads, access roads, streams, ditches, water ducts, bridges, and farming roads—all of which represented lines linking points pertaining to the activities of each and every villager; such spatial elements bridged residents with residents, individuals with groups, and groups with groups, thereby facilitating the flow of resources and communication.

Facilitating the flow of resources and expediting communication optimize resource use; community resident assembly meetings provide a platform on which decisions can be put into action. Therefore, changes in points such as the construction of a village center to prompt the activities of individuals or groups, the improvement of house roofs, the arrangement of a community wash place, the improvement of cattle sheds, the remodeling of kitchens, the improvement of toilets, and the rebuilding of houses revealed links in in-village roads, access roads, streams, ditches, and farming roads with other points, interacting with them and contributing to the improvement of the overall governance structure of the villages.

Usefulness of Reference Cases and Policy Implications

Changes in points, lines, and spaces of the four reference bridges resulting from the Saemaul projects significantly affected the implementation strategy of Saemaul Undong in effect at the time. Notably, specific projects seemed to have enabled Saemaul Undong, which strongly focused on the comprehensive development of regional society, to link with changes in specific points, lines, and spaces, thereby sustaining the implementation of Saemaul Undong. Enlightenment via Saemaul education alone cannot ensure the continuation of a specific project. One of the reasons Saemaul Undong succeeded was that the accomplishments in each phase were manifested to influence changes in the subsequent phase and secure the required momentum.



In such a context, this research is expected to verify conventional theories pertaining to the interaction between spatial structure and human activity. Theories have approached human activities from the perspectives of environmental determinism and environmental possibilism. The reason the evaluation of Saemaul Undong results in two extreme schools of thought is that the research methods are influenced by such different perspectives to some extent. Therefore, this research may verify J. Friedmann's (1972) argument, which combines both environmental determinism and environmental possibilism by analyzing the changes in spatial elements and decision-making process.

On the other hand, the analysis herein has made it clear that Saemaul Undong included a logic of practice that dependence theory-one of the two significant development models that originated with the Third World-failed to suggest. Therefore, the UN Economic and Social Commission for Asia and the Pacific (UNESCAP) singled out Korea's Saemaul Undong as one of the best practices for eliminating poverty in rural communities and resolved to promote it as a solution to the poverty issues in the region during its 2002 annual conference. Therefore, it is essential to examine how Saemaul Undong eliminated poverty in rural communities from a practical perspective.

The practical benefits and policy implications of this study are as follows. First, the knowledge of changes in the spatial elements at the village level stemming from the Saemaul projects provides a rationale for Korea to share its experiences with the global community. The specific and visible rearrangement of spatial structures made in Korea will provide basic inputs for subsequent efforts to turn our best practices into global standards, as

studies on such changes in spatial elements will demonstrate how Saemaul Undong alleviated poverty in rural villages, enhanced the capability of rural villagers, created social capital in farming villages, and established the local communities' governance structures. Logic shedding light on such chain reactions will provide evidence that Saemaul Undong was not merely a campaign, but also served as momentum for practical change. Therefore, studies as to how Saemaul Undong changed the spatial structure of villages will provide the rationale that Korea's experience in relation to Saemaul Undong could provide our own brand of an official development assistance(ODA) program.

Second, such specific studies will provide a basis through which we can address our pending issues by banking on the experiences in Saemaul Undong during the 1970s. Saemaul Undong was a useful experience wherein community members produced common goods based on the spirit of diligence, self-reliance, and cooperation. Therefore, the re-evaluation of Saemaul Undong is expected to confirm our common issues-be it from the spatial or spiritual perspective-and suggest how we can address such issues collectively.

The buzzwords of space management in the 21st century are the establishment of a community governance structure and the rebuilding of community by accumulating social capital. In other words, if Saemaul Undong is revisited from the perspective of community governance and social capital and the achievements of Saemaul projects are reviewed by the spatial element, it will affect the roles to be played by the state (public sector) and civil society(private sector), respectively.

Finally, an analysis as to how spatial elements at the village level changed under the influence of Saemaul Undong will contribute to the establishment of grassroots democracy in Korea. The process of assembly of community members to discuss and determine project priorities over specific spatial elements will provide references for efforts to use community activities as a medium for strengthening community residents' capabilities.

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Investment Evaluation Methods for Smart Infrastructure

Smart Roads

Cutting-edge technologies are making today's road networks increasingly smarter, incorporating a variety of features to ensure safe, rapid transportation. For example, Intelligent Traffic System (ITS) gathers and provides real-time traffic data while the auto calcium chloride spray system keeps roads in snow-prone areas from freezing over. In reality, such systems ensure safety and rapid transportation for drivers. Indeed, in January 2010, when a record 26 centimeters of snowfall hit Seoul, drivers on conventional roads suffered extreme congestion due to the frozen road surface whereas traffic on smart roads remained normal thanks to the auto calcium chloride spray system(see the picture below).

Although smart road facilities provide very useful transportation services to drivers, they increase road construction costs, thereby lowering economic viability in the investment feasibility study (cost-benefit analysis) preceding road construction as the potential benefits offered by the smart system can hardly be justified. In other words, as investment costs rise, economic feasibility declines in the cost-benefit analysis given the difficulty in accounting for the relevant benefits. Therefore, a need exists to develop a reasonable investment valuation

technique for smart roads designed to offer a variety of supplementary services.

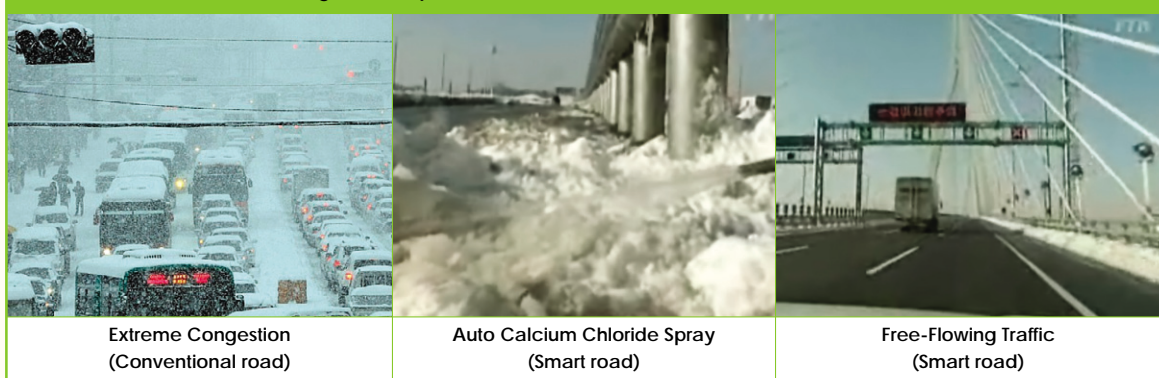
Need to Account for the Benefits of Smart Roads

In a broad sense, smart roads offer a wide variety of services focused on achieving five goals: improvement of mobility, manageability, information availability, comfort, and safety. Conventional investment appraisal techniques can to a certain extent estimate the improvement of mobility and safety. Although putting aside manageability and comfort, which are hard to quantify, may be acceptable, the estimation of benefits must include an unaccounted portion of improvement in terms of information and safety.

Assessing Benefits from Improved Information

Enhanced information availability enables drivers to take the optimum route and move rapidly thanks to the provision of real-time traffic information. To measure the improvement of information availability, the traffic information to be provided needs to be evaluated. Traffic information can be broken down into two types: one-way information transmitted to the anonymous majority (information

Figure: Comparison between Conventional & Smart Roads



made available via roadside VMS, etc.) and personalized information (information made available via individual devices on smart roads).

To estimate the value of information, the evaluation method needs to be selected based on the characteristics of the traffic information to be offered by the smart road. Several methodologies used in a variety of research literature related to the estimation of the value of traffic information were reviewed and their merits/demerits compared; a survey-assisted conditional value estimation method was adopted. However, such a method has several weaknesses; thus, a variety of techniques to make up for these weaknesses were utilized in the survey phase. To help respondents understand the situation better, the applicable space was limited to a smart road; 593 respondents consisting mostly of expressway users were surveyed in person.

The survey findings and modeling analysis indicated that the Willingness To Pay (WTP) of the traffic information service available on the smart road was estimated to be 0.8cent/veh-km approximately 3 times more than the value of one-way traffic information. When a business trip was the purpose of road use, the average WTP was estimated to be 0.91cent; in the case of a non-business road user, the average WTP was estimated to be 0.76cent.

In terms of benefits from the information value over time, the daily benefit is estimated considering the peak and non-peak duration; meanwhile, weight and annual benefit from the information value are estimated by multiplying the daily benefit by 365.

Estimated Benefits from Improved Safety

The reduction of traffic accidents translates directly into two types of benefits for citizens: the

reduction of bodily injury/property damage attributable to the decline in accidents and the reduction of delays/congestion. The reduction of bodily injury/property damage can be quantified using conventional investment appraisal techniques. The reduction of delays/congestion is achieved by providing supplementary services designed to improve safety and reduce accidents. The latter is not used as benefit metrics in the conventional investment appraisal guideline.

To estimate the reduction of delays/congestion attributable to a decline in accidents, it is important to estimate the average duration of accidents since the time during which a vehicle is impacted by accidents should be estimated. Various accident duration prediction models are available. Delay was simulated and expressed in the regression equation. The variables required for simulation were determined by analyzing the DB data on expressway accidents from 2006 to 2008. In the 3 years covered in the analysis, a total of 5,913 expressway accidents occurred.

According to the accident data analysis, the average traffic block time attributable to accidents was approximately 38 minutes for the entire expressway; 29.9% (1,767 accidents) of all accidents allowed for normal traffic. A total of 2,106 accidents blocked traffic for 30 minutes or less, accounting for 35.6% of the total accident count. Accidents that blocked traffic for more than 30 minutes made up 34.5% of the total accidents.

A accident scenario was developed from the accident data in terms of road characteristics, traffic demand, block time, blocked lane count, and capacity reduction ratio. The scenario model was analyzed to produce the regression equation for the estimation of the average delay per vehicle, and costs associated with the delay attributable to

Table : Relationship between Smart Road-Supported Service Goals & Conventional Investment Appraisal Technique

Goals	Relationship with the Conventional Investment Appraisal Technique
Mobility	· Conventional technique can estimate the benefits.
Manageability	· It is not customary to count it as a social benefit.
Comfort	· Qualitative item hard to estimate using a defined index Information Availability
Information Availability	· Need to estimate the value of information and count it as a benefit in the digital age
Safety	· Reduction of bodily injury/property damage: Conventional technique can estimate the benefits. · Reduction of delay/congestion resulting from accident reduction: need to account for such reduction, since its benefit is fairly significant even in intuitive terms

Table : Value of Traffic information (unit : cent /veh-km)

Info Type	Trip Purpose		
	Business	Non-business	Both
One-way	-	-	0.3
Two-way	0.91	0.76	0.8

The figure consists of two bar charts. The left chart shows the value of traffic information for One-Way info (0.3) and Two-Way info (0.8). The right chart shows the value of traffic information for Two-Way info (Business trip) (0.91) and Two-Way info (Non Business trip) (0.76).

$$VOI = \sum_i P_k \times Q_l \times D_l$$

Where VOI = Value of information,

P_k = Value of information type k (cent/veh-km)

Q_l = Traffic flow of link l (veh/hr)

D_l = Distance of link l (km)

accidents were estimated. The annual benefit from the improvement of safety can be estimated by calculating each vehicle-kilometer of expressway link from the road traffic allocation results.

Benefits Delivered by the Smart Roads

The Sejong-Yongin road section was selected for analysis among the expressway sections now planned in Korea. The total benefits from the section, which were estimated to be incurred over 30 years using conventional investment appraisal benefit, were found to be about 1.282 trillion won when the discount rate was applied. The smart road was estimated to require about 2.24 billion won more than the conventional expressway per kilometer for the installation of ITS and safety facilities, which translates into 129.6 billion won more in construction costs. Given such costs, smart road costs(including operating costs) were estimated to be 2.903 trillion won for 30 years or about 1.317 trillion won when the discount rate was applied. Therefore, if the smart road is built in the Sejong-Yongin section, the B/C ratio is 0.93, thereby rating the project viability at less than 1.0.

$$CC = Y \times VOT$$

CC = Cost of delay by accident

VOT = Value of time

Y = Average delay estimated by regression equation (sec/veh)

$$= 152.6 e^{0.00159x}$$

$$X = -3,077 + 2,346X_1 + 2,474X_2 + 22.1X_3$$

X_1 : Capacity reduction ratio,

X_2 : V/C (at normal times),

X_3 : Duration of accident (min)

When the smart road benefits were applied, somewhat different results were produced. First of all, the total value of information to be incurred over 30 years was 510.56 billion won, or about 17% of the benefits from the reduced trip time. The reduced delays/congestion resulting from the improved safety amounted to 69.61 billion won or 139.22 billion won over 30 years when the accident reduction rate was assumed to be 10% and 20%, respectively.

The B/C ratio of the smart road was estimated to be 0.93 when only the benefits specified in the conventional investment appraisal guideline were considered. However, when the benefits attributable to information value and safety improvement were also considered, the B/C ratio increased to 1.1, thereby making the smart road project economically viable.

The underlying purpose of this research is to help citizens living in the information and communication technology era appreciate the value of traffic information in their life and recognize the significance of diverse safety services designed to enable them to save time that could be wasted on roads. The benefits of smart road facilities were estimated without digressing significantly from the rationale of the conventional investment appraisal technique out of respect for human life in order to help policymakers save time in the decision-making process. More extensive research into the investment appraisal technique should be conducted, and road facilities designed to materialize the benefits intended herein must be built in the future.

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KRIHS' INTERNATIONAL COOPERATION

KRIHS-World Bank Joint Workshop on Urbanization Review



For two days from December 13 to December 14, 2010, KRIHS and the World Bank held a joint workshop under the theme of “Urbanization Review: Lessons from Korea and International Experiences.” The workshop aimed to explore strategies focusing on supporting regional development in developing countries by introducing Urbanization Review, a program the World Bank is pushing forward, and urban development experiences of major countries including Korea, India, China, Vietnam, and Columbia.

On December 13, it consisted of two presentations on strategies for urban development and urbanization, which are the World Bank’s major strategies for supporting developing countries, and on best practices of Korea’s urbanization.

On December 14, the workshop comprised four presentations and a discussion session, with a focus on issues related to urbanization by country: urbanization challenges and policy issues in India; the transfer of rural land for construction in China; policy issues for improving quality of urbanization in Vietnam; and the system of cities in Columbia. Discussions centered on strategies of supporting World Bank urban development projects, and Korea’s best practices in applying related strategies to government policies. Before wrapping up the two-day meeting the two institutions agreed to expand mutual cooperation through the

previously signed MOU in such fields as research and analysis on green cities, consultation and education, and exchanging experts.

Visit to the World Bank and the UN

A KRIHS delegation visited the World Bank and the UN for seven days from January 25 through February 1, 2011. Their visit came as the Global Development Partnership Center(GDPC) was launched as a way to promote development and cooperation in the fields of education, training, consulting, and establishing global networks and to put the development agenda adopted in the G20 Seoul Summit into action. This visit reciprocated the signing of the MOU between KRIHS and the World Bank on December 14, 2010. It was also a response to a request by the World Bank for KRIHS experts to participate in a seminar entitled “Sustainable Cities of the Future” when the bank launched “Urban Sector Week” from January 31, 2011 to February 3, 2011.

The visit comprised a series of advisory meetings and talks with high-ranking officials: the delegates met with the chief of the Cartographic Section of the UN in order to review a commissioned research on “the Establishment of a Road Map for Launching the UN-GGIM World Forum,” and to discuss measures for a successful exhibition of global GIS companies and business forums; in an advisory meeting with Ms. Inger Andersen, vice president of the World Bank, the delegates



promoted its newly established the GDPC and discussed the importance of gathering information to work with the World Bank in a sustainable manner, and the Vice President asked KRIHS to join the members of the Global Knowledge Partner of KRIHS; in a working-level meeting with the World Bank, the bank proposed that KRIHS organize the 6th Urban Research Symposium held every other year. On the last day of the trip, Dr. Jo Jin-cheol, research fellow of KRIHS, delivered a presentation on “Low Carbon Green Growth and Urban Planning Strategies in Korea.”

This visit will lead to further cooperation between KRIHS and the World Bank after their signing of the MOU and to forging networks with experts participating in the “Urban Sector Week” program organized by the World Bank. With the opening of the GDPC, KRIHS is seeking measures to cooperate for further development with other financial institutions, similar to the World Bank, for the purpose of expanding its capacity to build global development cooperation.



Celebratory Seminar in Honor of Signing MOU with UCL

On February 10, 2011, KRIHS held a celebratory seminar in honor of signing an MOU between KRIHS and University College London(UCL). At the seminar, under the theme “National Urban Policy in Transition: Historical Development and Future Direction in the UK and the Republic of Korea,” Professor Nicholas A. Phelps and Professor Claudio de Magalhaes,



University College London, made presentations on “A History of British Urban Policy since 1947,” and “Governance Structure of British Urban Planning in Retrospection.” From the KIRHS side, Dr. Park Jae-gil, senior research fellow, and Dr. Lee Wang-geun, research fellow, delivered presentations on “Prerequisites for Better Urban Policies: Reviewing Urbanization & Urban Planning Efforts in Korea,” and “Urban Development Policy in a Transitional Period in Korea,” respectively.

Moderated by Dr. Kim Hyun-sik, senior research fellow of KRIHS, the discussion session was attended by Professor Kim Hyun-soo, Dan-Kook University, Professor Bae Woong-kyoo, Chung-Ang University, Mr. Yu Sung-yong, director of the Urban Policy Division of the Ministry of Land, Transport and Maritime Affairs(MLTM), and Dr. Kim Sung-soo, associate research fellow of KRIHS. There, they discussed the development process of urban policies of Korea and the UK and shared views on key policy directions for future cities.

First EAROPH Workshop 2011 in Malaysia

On March 5, 2011, the first EAROPH Workshop of the year 2011 was held in Malaysia. Ten participants from four countries attended the workshop. The attendees included Ms. Norliza Hashim, secretary general of EAROPH, and Dr. Kang Mi-na, director of the Center for Housing Welfare Policy of KRIHS.

The workshop aimed to discuss major agenda



items including a new eight-year(2011-2018) strategic plan of EAROPH; a mid-term review set in 2014; a financial plan and management schedule for 2011-2018; the strategic roles of EAROPH's national chapters; the role of the EAROPH Korea secretariat; and hosting the "2012 EAROPH International Congress" in Korea.

GDPC Hosts Education & Training Program for Government Officials from Vietnam



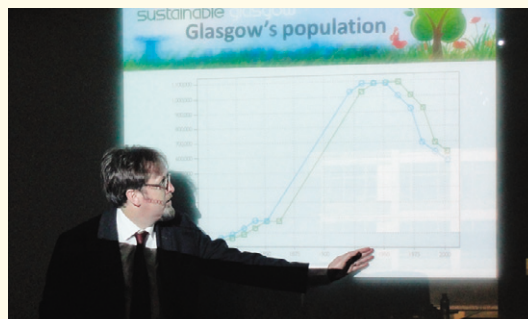
The KRIHS-affiliated Global Development Partnership Center (GDPC) held an education and training program on policy development of the transportation infrastructure from January 16 to 25, 2011. The program focused on sharing Korea's experience accumulated in the process of carrying out its advanced transport infrastructure and developing relevant policies and exploring applicable measures to Vietnam through cooperation between the two countries. Eight Vietnamese government officials including Mr. Nguyen Huu Chi, vice minister of the Ministry of Finance of Vietnam and Mr.

Nhuyen Tan Thinh, deputy director of the Department of State Asset Management (DSAM) of the Ministry of Finance of Vietnam participated in the program.

The 10-day program consisted of meetings with high-ranking officials including vice ministers of the Ministry of Land, Transport and Maritime Affairs(MLTM), and the Ministry of Strategy and Finance(MOSF), and Incheon city's deputy mayor. The eight participants also visited relevant institutions including the Korea Railroad Research Institute, the Korea Expressway Corporation, the Incheon Port Authority, and the Incheon International Airport Corporation.

Senior Research Fellow of the Fraser of Allander Institute Invited to Lecture

On February 18, 2011, the Global Development Partnership Center and the Green Territory & Urban Research Division jointly hosted an expert meeting regarding "Sustainable Urban City." In the meeting, which was held in collaboration with the British Embassy, Mr. Richard Bellingham, senior research fellow of the Fraser of Allander Institute delivered a presentation on "Integrated Strategic Approaches to Delivering Sustainable Cities." He also explained measures to reduce the environmental impact of human societies, whilst simultaneously meeting the needs and aspirations of a growing population through economic growth. He also stressed that the urbanization of societies creates both challenges and opportunities.



NEWS & ANNOUNCEMENTS

Public Meeting on Saemanguem Reclamation Project

On December 22, 2010, KRIHS held a public meeting on the Master Plan of the Saemanguem Reclamation Project, which has been further materialized from the framework of the 1.28 Saemanguem Reclamation Project. The newly unveiled master plan includes detailed plans for land use and intra arterial transport networks. It also suggests transport networks such as highways connecting Saemanguem and Pohang and a 45km-long double track line linking Saemanguem and Daeya. The master plan focuses on the following elements: building a prestigious residential settlement, dubbed “Ariul,” equipped with green and waterfront zones; forming an environmental-friendly waterfront city; constructing new and renewable energy-based complex and laying a foundation for using new generation energy sources; developing an export-oriented farming complex with global competitiveness; pushing for new ports and the launch of international flight routes.



Expert Meeting on U-city Future Spatial Technology and Mind Map

On January 21, 2011, KRIHS held an expert meeting on “U-city Future Spatial Technology. U-city related experts from the Ministry of Land, Transport and Maritime Affairs(MLTM), and the U-eco City Unit of Korea Land and Housing Corporation were invited to the meeting, which was aimed at analyzing and reviewing the current trends of U-city and strategies for future spatial



technology development, a research project conducted by KRIHS. Dr. Kim Kirl, associate research fellow of KRIHS, introduced the project and Dr. Lim Si-young, associate research fellow of KRIHS, gave a presentation on the shift in perspective towards the U-city and a mind map for U-city’s future spatial technology. In the following discussion session moderated by Mr. Yoon Hyun-soo, director of the Urban Regeneration Division, U-city experts in the fields of industry, academia, and research dealt with the considerable factors involved in the proposed agenda, as well as research directions and development strategies for U-city.

Education and Training Program for Vietnam’s High-Ranking Officials

On January 21, 2011, KRIHS held an education and training program entitled “Study Tour for Low-Income Housing Policy of Korea” for high-ranking officials from Vietnam. The program was organized by the International Urban Training Center(IUTC) and UN-HAVITAT. A group of 12 members, including Mr. Nguyen Trong Ninh, deputy director of Housing Management in the Department of the



Ministry of Construction, attended. The program aimed to derive implications for Vietnam's housing policy through Korea's low-income housing policies and its experience of establishing a comprehensive housing policy.

Senior Executive Officer of Cosanti Foudation Gives Special lecture at AURI



On January 18, 2011, the KRIHS-affiliated Architecture and Urban Research Institute(AURI) invited Mr. Tomiaki Tamura, senior executive officer of the Cosanti Foundation, to hold a lecture. In his lecture, "Lean Alternative: Elegant Frugality," Mr. Tamura introduced the design philosophy of Paolo Soleri, a founder of the Cosanti Foundation, which aims to realize the values of construction and urban design not only from a quality perspective but also from a quantity perspective as an alternative to current reckless consumption patterns. The Cosanti Foundation, a prototype urban planning research center, seeks to pursue changes from a broad-based perspective, moving away from the American Dream centered on consumption culture.

Seminar on Low Carbon Green Cities

On December 13, 2010, a seminar promoting low carbon and green cities was held at the Seoul Education and Culture Center. The seminar was jointly organized by the Ministry of Land, Transport and Maritime Affairs, the Korea Research Institute for Human Settlements, the Korea Planners Association, and the Urban Design Institute of Korea. The seminar comprised two sessions and an in-depth discussion among six experts from the government, universities, and research centers. Six presentations were made at each session, the themes of which were, "To Promote Low Carbon and Green City" and "To Establish Plans for Low Carbon and Green City." Dr. Chae Chang-woo, research fellow of the Korea Institute of Construction Technology, gave a presentation on countermeasures in the construction sector to promote green cities, and Dr. Wang Kwang-ik, associate research fellow of KRIHS, presented measures to establish plans for low carbon and green cities. The ensuing discussion covered comprehensive policy proposals for pursuing low carbon and green cities and problems arising in the process.



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KRIHS carries out various activities to collaborate with the international research community in solving theoretical and practical problems concerning human settlement issues and planning. Also, it provides research expertise and consulting services along with training programs for foreign governments and institutions.

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