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Changes to Spatial Structures of National Territory and Policy Implications

SeongHee Min

1. Backgrounds

According to future population projections (2016a) of Statistics Korea, the total population of South Korea is expected to start decreasing after peaking at 52.96 million in 2031 and number about 43.02 million in 2065 (the 1990 population level). Moreover, the population growth rate of the country is projected to turn negative in 2032 and fall to -1.03% in 2065. From 2029, a natural population decrease is expected to begin with the number of deaths exceeding the number of births.

Population decline and demographic changes due to low birth rates and population aging are now national issues that have impacts on the entire society. In particular, the growth drivers of the national economy have been undermined by a shift from Demographic Bonus[1] to Demographic Onus[2] caused by a decrease in the working-age population. The aging population has led to various demands for local public services, increasing administrative costs of municipalities and other complex issues. In addition, population decline in a region also affects the social and economic vitality of the region, resulting in poor access to and aging of infrastructure, which ultimately leads to lower quality of life.

Meanwhile, such population decline and demographic changes have different levels, speeds, and reasons by region, and different parts of the country do not show similar population decline or demographic changes. Statistics Korea's future population projections by city and province (2016b) show that Gyeonggi-do has seen a steady population increase, but Jeollabuk-do, Jeollanam-do, Gyeongsangbuk-do, and the other provinces have suffered population decreases from the 1970s.

Such population decline does not happen in every part of the country in a balanced

1 Demographic Bonus means additional economic growth potential as the labor force and consumption increase thanks to a temporary increase in the ratio of the working-age population (between ages 15 and 64).

2 Demographic Onus means the opposite of Demographic Bonus. It refers to a situation in which economic growth slows down as the working-age population becomes old and the ratio of the working-age population declines.

KRIHS Gazette

KRIHS (Korea Research Institute for Human Settlements) was established in 1978 with a mission of creating a beautiful and pleasant living environment. To achieve the mission. KRIHS has been committed to enhancing the quality of life and well-being of the people in the nation with its spatial planning studies and policy suggestions.
Since its foundation, KRIHS has carried out a variety of studies on the efficient use, development, and conservation of territorial resources. Its research areas range from sustainable and balanced territorial development and conservation of the territory to the provision of housing and infrastructure.

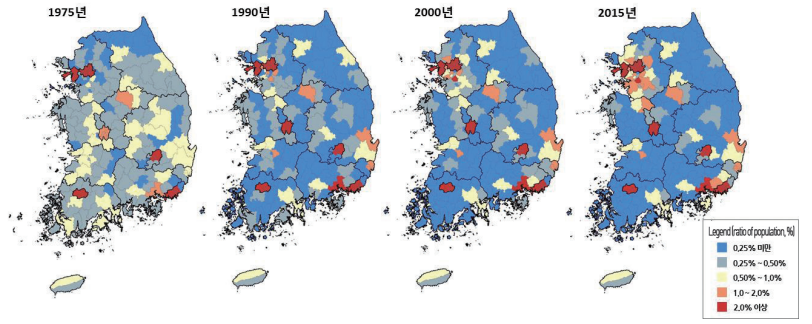
way. A population decrease in a certain region results in population growth in large cities, and it causes a gap in regional development. If the young population leaves a region and the population ages faster in that region, it undermines the vitality of the local community, encouraging more of the young population to leave. It creates a vicious cycle with continuous population decline.

2. Characteristics of Demographic Changes and Spatial Structure of National Territory

Widening Population Gap Between Regions

Population distribution across the country shows a widening gap between regions: certain regions including Seoul Metropolitan Areas and metropolitan cities have seen a steady increase in their population while most counties (gun) have suffered population decline. Seoul and metropolitan cities represent a high ratio of population in the national population, but the number of cities and counties with low population ratios has grown from 1975 to 2015. In particular, the portion of the national population residing in counties has declined from 25.1% in 1975 to 12.6% in 1990, 9.4% in 2000, and 8.3% in 2015. If the national population starts to decrease, population density in large cities is expected to be higher while other areas are projected to suffer greater population decline, widening the population gap between regions.

Figure 1. Ratio of Regional Population in National Population from 1975 to 2015



Sources: Min Seong Hee et al., 2017.

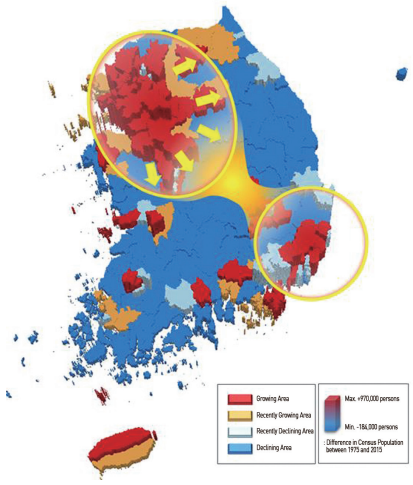
Continuous Concentration in the Seoul Metropolitan Area and Spatial Expansion

Population growth is increasing in some cities and counties of Chungcheong-do and Gangwon-do near the Seoul Metropolitan Area. Areas with steady or recent population growth are emerging in cities and counties of Gyeonggi-do and Chungcheong-do that link the Seoul Metropolitan Area and Sejong Special Autonomous City. Some cities and counties of Gyeonggi-do and Gangwon-do that connect Seoul Metropolitan Area with Chuncheon and Wonju have also seen population increases. The ratio of population in areas around the Seoul Metropolitan Area to the national population is growing: a recent population decrease in inner Seoul has directly led to population increase in those areas, and people move from Seoul to cities and counties around Seoul and then to cities and counties around the Seoul Metropolitan Area. As a result, the presence of the Seoul Metropolitan Area has expanded.

Metropolitan Cities also Experience Population Growth in their Surrounding Areas

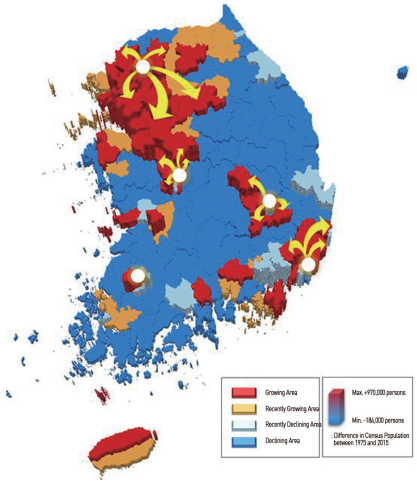
Large cities outside the Seoul Metropolitan Area have expanded due to population increases in their surrounding areas. While the population decreases in small and medium-sized cities and rural areas, populations are concentrated in and around large cities. In addition, population movement from the downtown of large cities to surrounding areas also plays a role. Population growth in and around large cities leads to expansion of urbanized areas and changes in land use, which makes it important to strengthen functional connections between large cities and their surrounding areas. If the development of transportation further facilitates movement of people between regions and brings changes in the size of a neighborhood unit, areas surrounding large cities are expected to grow faster, making administrative boundaries have less impact on people's daily life.

Figure 2. Widening Population Gap and Expanding Seoul Metropolitan Area



Sources: Min Seong Hee et al., 2017.

Figure 3. Expansion of Large Cities and their Surrounding Areas



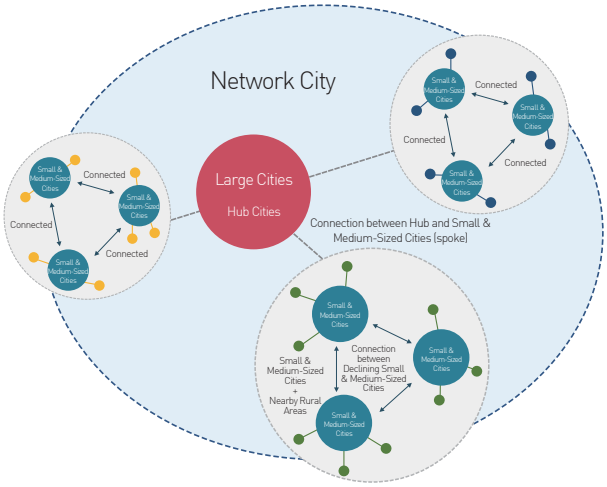
Sources: Min Sunghee, et al., 2017.

3. Policy Implications from Changes in Spatial Structure of National Territory

Establishment of Network City System

In order to address population imbalances in national territorial spaces and the population concentration in the Seoul Metropolitan Area, it is important to establish a network of cities that connect metropolitan cities, cities designated for innovation, small and medium-sized cities, and their surrounding areas. For small and medium-sized cities with population decreases and aging, three to five cities should build a partnership to share high value-added services or essential functions including economic and educational services. In addition, it is necessary to introduce a spatial planning system based on metropolitan areas in order to effectively respond to the expansion of large cities and population decline.

Figure 4. Design of Network City System



Sources: Min Seong Hee, et al., 2017.

Promotion of Compact Regional Regeneration

The concept of compact regeneration should be reflected in spatial planning in order to promote efficient use and operation of public facilities and infrastructure. Most areas with declining population have the issue of inefficient land use due to the hollowing out of inner cities, migration of urban facilities to the suburbs, and an increase in underused or idle land. Thus it is necessary to promote compact development to use spaces efficiently and intensively.

It is also necessary to implement customized regional regeneration projects. In addition to urban regeneration for declining areas in Seoul and Metropolitan Cities, it is also necessary to execute regeneration projects customized to inner cities that are in decline due to the establishment of innovation cities and the situation of small and medium-sized cities. As rural areas have different reasons for population decline and consequent deterioration from urban areas, regeneration plans customized to rural areas are also needed.

A comprehensive management system for idle facilities and real estate is also necessary. A guideline and incentive system to efficiently use various resources should be provided in order to move away from growth-oriented development planning and encourage planning at an appropriate scale.

Access to Basic Infrastructure

It is important to provide basic infrastructure to declining areas in inner cities and areas that face risks of extinction due to rapid population decrease. Basic infrastructure is critical to improving convenience in daily life and maintaining and enhancing the quality of life. Thus despite population decline, essential basic infrastructure including transportation and medical and educational facilities should be provided to ensure that there are no "blind spots" in terms of basic services.

For this purpose, a minimum standard for basic infrastructure should be established to ensure the minimum quality of life across the country. In addition, a national minimum standard should be introduced to come up with a local optimum for each region by identifying public services and standards that are suitable to the size of a region, its population mix, and its spatial characteristics.

References

Min Seong Hee, Byun Pilsung, Kim Sunhee, Lee Soonja, Hwang Myunghwa, and Cha Eunhye. 2017. Prospects of National Territory by Demographic Change and Policy Implications. KRIHS.
Statistics Korea. 2016a. Future Population Projections: 2015–2065.
Statistics Korea. 2016b. Future Population Projections by City and Province: 2015–2045.

IN-DEPTH LOOK 02

Developing the KRIHS Disaster Risk Management System for Preventing Cities from Urban Flooding

Lee Sangeun, Lee Jongso, Kim Seulyea

1. Background

■ As the frequency of flooding and the extent of damages increase due to climate change, it has become necessary to come up with fundamental measures at urban level.

■Internationally, according to the United Nations Office for Disaster Risk Reduction(UN ISDR)'s Sendai Framework for Disaster Risk Reduction and the United Nations Sustainable Development Goals (UN SDGs), urban policies should emphasize disaster prevention and resilience, while they also concentrate on measures for land use, building and urban infrastructure.

- In order to establish disaster prevention measures in urban plan, the Korean government has been implementing various policies. For example, the Ministry of Land, Infrastructure and Transport amended the National Land Planning and Utilization Act in 2015, making it mandatory to conduct the vulnerability analysis of climate change driven disaster.
- However, the effectiveness of the disaster driven measures in urban plan is still not enough. (Kim et al., 2017).

■In order to take preventative approach to urban flooding, it is necessary to produce risk-related information that can be trusted, as well as set up and operate an information providing system so that it can actually help with local government's urban disaster prevention plan.

- In terms of the management of national territory, the areas that urgently needed urban disaster prevention measures because of high risk of urban flooding were distinguished as the priority management areas (PMAs). In order to support the expertise in the field of disaster prevention when the person in charge is establishing the urban plan for these PMAs, the KRIHS Disaster Risk Prevention Aid System for Urban Flooding (KRIHS-AID) was developed (Lee et al., 2016; 2017a; 2018a)

■Together with the Ministry of Land, Infrastructure and Transport, the KRIHS plays the role of providing spatial information that shows various risk factors in PMAs through this system, while also notifying the location of risk hotspots that require urban disaster prevention and consulting about the direction of establishing measures suitable to on-site conditions.

- This article will explain about how the KRIHS-AID was established to fulfill the above roles.

2. Urban flooding risk information in KRIHS-AID

2.1 Set the impact zone of urban flooding in PMA

■As the input value of the flooding analysis, rainfall scenario data with consideration of climate change impacts on probabilistic characteristics of short-term rainfall is applied.

- Based on the observed rainfall data, the simulation of 19 GCMs were temporally and spatially downscaled. The reference table was then set up to allow the probability rainfall to be identified according to the location of PMAs.
- Based on RCP 8.5, rainfall intensity with 100-year and 30-year return period was used as a rainfall scenario for the period from 2041 to 2070.

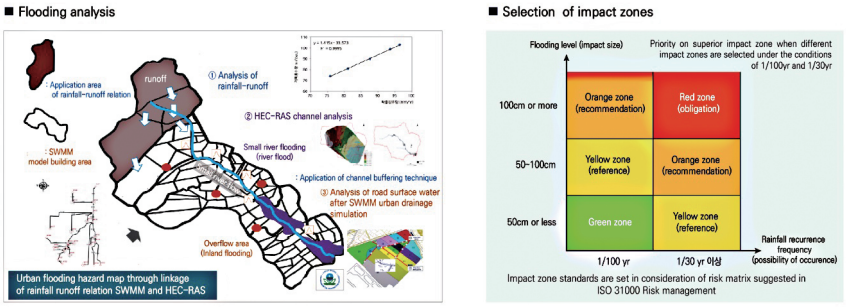
■River flood is analyzed at the condition of 100-year rainfall intensity, and inland flood is analyzed at the condition of 30-year rainfall intensity (Lee and Lee, 2018):

- River flood area and inundation depth were analyzed using HEC-RAS and GIS tools.
- Inland flood was analyzed by using EPA-SWMM in order to identify locations and the volume of overflow, and the flood area and inundation depth were analyzed by the 2-Dimension surface flow analysis model.

■By utilizing the results of two flood analyses, set the impact zones of the PMA.

- According to four inundation depth criteria, including over 100 cm, 50~100 cm, 10~50 cm, 10~50 cm, and less than 10 cm, the urban space was divided into Red Zone, Orange Zone, Yellow Zone, and Green Zone.

Figure 1 Flooding analysis methodology and impact zone criteria



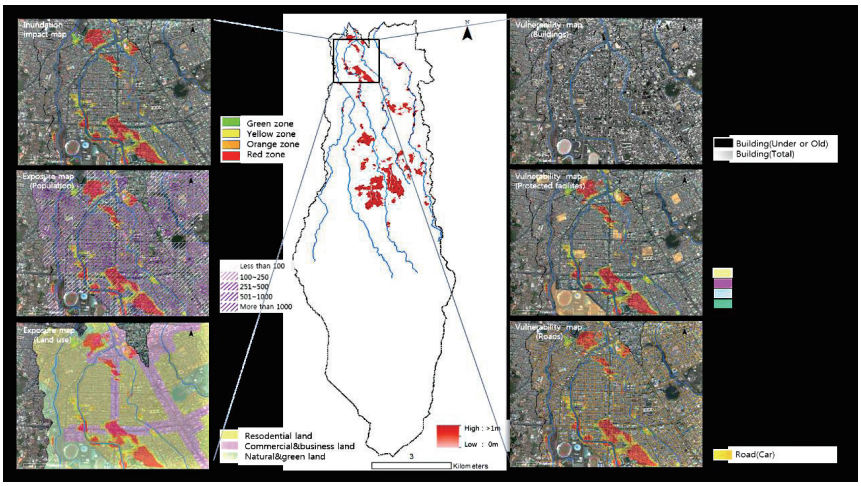
Source: Lee et al. (2016; 2017a; 2018a)

2.2 Develop various risk information regarding urban flooding

■In order to analyze the risk of urban flooding from various aspects, the risk information was constructed by combining the flooding analysis results (impact zone maps) and various GIS information.

- Hazard was defined as 'the degree to which a certain area is threatened by flood in rainfall conditions exceeding defensive capacity', and its thematic maps were obtained from flood depth.
- Exposure was defined as 'the degree to which a certain area is exposed to flood in rainfall conditions exceeding defensive capacity' and its thematic maps were obtained from maps with maps of resident population and land use.
- Vulnerability was defined as 'the degree to which a certain area is inherently sensitive to flood, irrespectively of occurrences of hazards' and its maps were obtained from maps of buildings with underground floors or with ages with over 30 years, critical facilities and road distribution.

Figure 2 Examples of urban flooding risk information developed for PMAs



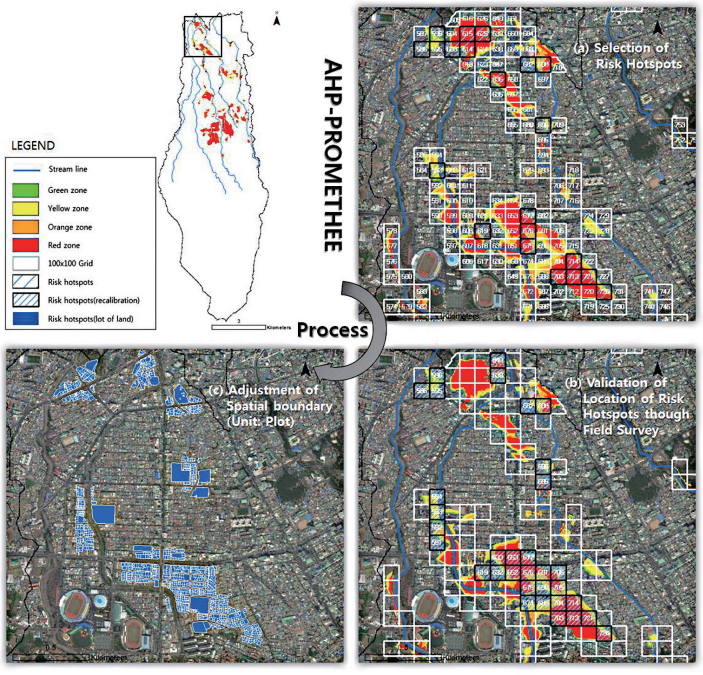
Source: Lee et al. (2018b)

3. Urban disaster prevention measures in KRIHS-AID

■By applying various risk information to the multi-criteria decision making method (Lee et al., 2017b), risk hotspots are identified so that the locations of places necessary to require disaster prevention measures are reasonably selected.

- The risk information was overlapped with the national grid code provided in 100mX100m and all the risk information is integrated into each grid.
- Through the detailed risk information established in grid units and Analytic Hierarchy Process (AHP), the weight of the valuation criteria derived was applied to PROMETHEE (Preference Ranking Organization Method for Enrichment Evaluations), which is a method of analyzing preference ranking, in order to identify the grid numbers applicable to the risk hotspots and derive the main cause of the risk.
- Through the on-site investigation and the readjustment of spatial extents, the above results were refined to identify the realistic land units, i.e., parcels, corresponding to risk hotspots (Lee et al., 2018b)

Figure 3 Process of selecting locations of the risk hotspots



Source: Lee et al. (2018b)

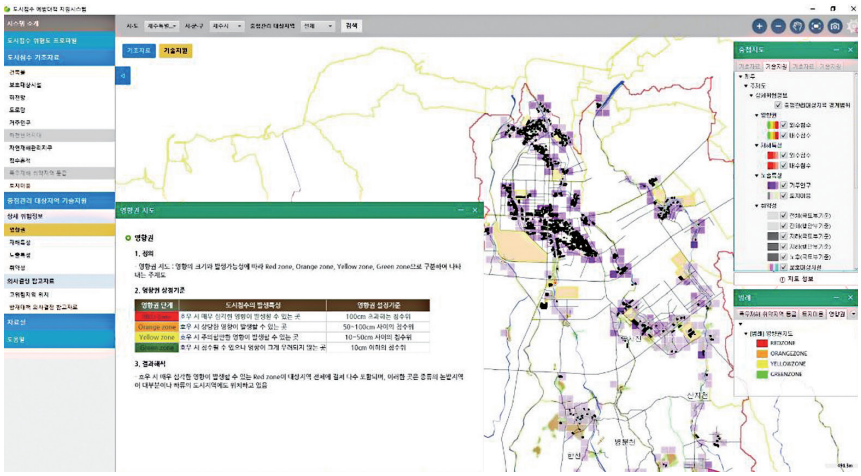
4. Conclusion

■ With all developed technologies together, KRIHS (Korea Research Institute for Human Settlements) developed the KRIHS-AID system, shown in < Figure 4 > , in order to help persons in charge of land use planning in local governments access to urban flooding risk information.

■KRIHS conducted pilot projects with two local governments, planning urban disaster prevention measures preliminarily by using the KRIHS-AID.

- Pilot projects concluded that the KRIHS-AID can produce reliable risk information necessary to prevent urban areas from flood
- To maximize its potential, it is urgent to make institutional basis related to national land planning.
- In addition, it is necessary to promote national R&D projects in the near future so that the KRIHS-AID deals with various kinds of hazard including landslides, tidal waves and drought as an integrated disaster prevention system.

Figure 4 Results of developing KRIHS-AID



Source: Lee et al. (2018a)

References

- Lee Sangeun, Kim Changhyun, Park Taeseon, Kim Mieun, Kim Seulyea. 2016. Development of the Urban Flooding Risk Prevention System (I). Korea Research Institute for Human Settlements (KRIHS).
- Lee Sangeun, Lee Byungjae, Lee Jongso, Kim Seulyea, Lee Taesam, Song Changgeun, Kim Jinhyun. 2017a. Development of the Urban Flooding Risk Prevention System (I I). Korea Research Institute for Human Settlements (KRIHS).
- Lee Sangeun, Kim Jongwon, Lee Byungjae, Han Wooseok, Lee Jongso, Kim Seulyea. 2018a. Development of the Urban Flooding Risk Prevention System (I I I)-Data of interim research council. Korea Research Institute for Human Settlements (KRIHS) (expected to be published in January 2019 report).
- Lee Sangeun, Lee Jongso, Kim Seulyea. 2017b. Selection of Flood Risk Hotspots in Urban Areas: Based on the AHP-PROMETHEE Method. Korea Research Institute for Human Settlements (KRIHS), Volume 94, pp.51-64.
- Kim Seulyea, Kim Mieun, Kim Changhyun, Lee Sangeun. 2017. Study on Urban Policies Toward the Effective Disaster Prevention. Journal of the Korean Society of Safety, Volume 32, No.2. pp.124-131.
- Lee Jongso, Lee Sangeun. 2018. Development of Urban Flood Risk Maps for Strengthening Urban Planning Toward Disaster Prevention. Korean Society of Civil Engineers, Vol.38, No.2, pp.203-213
- Lee Jongso, Song Changgeun, Lee Sangeun. 2018b. Evaluation of Risk Hotspots to Urban Flood for a Spatial Disaster Risk Management: A Case Study of Jeju City. To be published (Volume 98)

A Study on New Industrial Location Policy in the Era of the Fourth Industrial Revolution

Gichan Nam

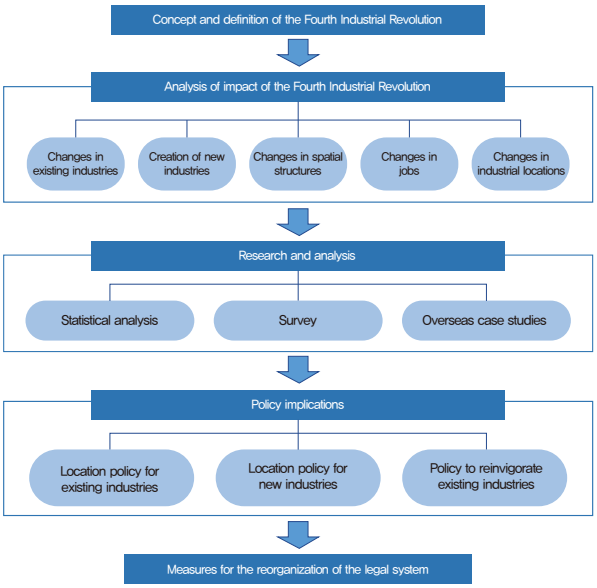
1. Overview

The era of the Fourth Industrial Revolution has already begun despite disputes over the concept and substance of the revolution, which were first suggested at the World Economic Forum in Davos, Switzerland, in 2016. Moreover, a growing number of people agree that the Fourth Industrial Revolution will be increasingly important for the economy and society.

The Fourth Industrial Revolution is expected to bring about structural changes in industries including hyper-connectivity, hyper-intelligence, cyber physical systems, and mass customization. In addition, the growing importance of qualified human resources is projected to encourage more industries to move to urban areas, which means economic activities are increasingly concentrated in large cities.

Meanwhile, the Fourth Industrial Revolution is projected to accelerate polarization in terms of industrial locations: new technological and industrial players are expected to gather in downtown areas while traditional manufacturers of goods and materials such as automobiles, home appliances, shipbuilding, steel, and chemicals are projected to have higher demand for business sites in the suburbs thanks to production innovation.

This study performed an analysis of networks of companies in new industries in order to analyze the characteristics of new industries in the era of the Fourth Industrial Revolution, an analysis of the trend of changes in existing industries following technological innovation caused by the Fourth Industrial Revolution, and a typological analysis of locations for new industries based on an industry-specific survey on companies in new industries and comparison between company databases and the survey results.

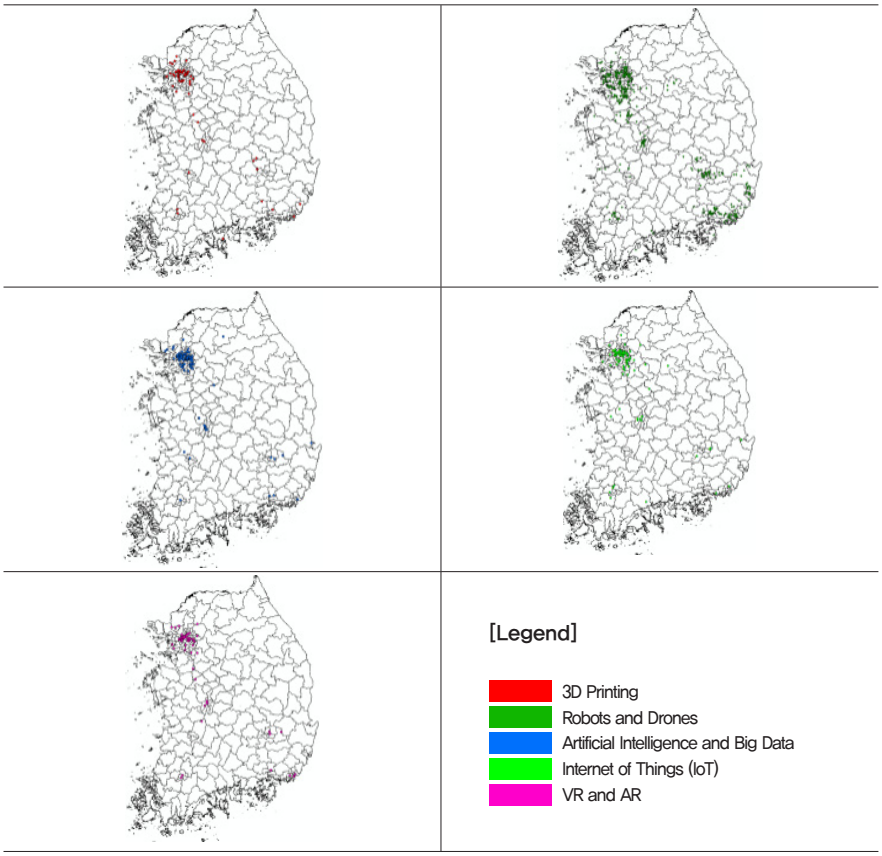


2. Analysis of Locations for New Industries and Policy Implications

1) Analysis of Characteristics of Locations

For the analysis of characteristics of locations for new industries in the era of the Fourth Industrial Revolution, 1,130 companies were selected in five sectors of new industries: Internet of Things (IoT), robots and drones, 3D printing, virtual reality and augmented reality (VR and AR), and artificial intelligence (AI) and big data. Those companies produce goods that are directly related to the basic technologies of the Fourth Industrial Revolution. The result of the analysis shows that robots and drones account for about 50% of the companies selected. Of the companies, 68.8% are headquartered in and around Seoul (the Seoul Metropolitan Area), and 61.1% have leased spaces for their head office.

Spatial Distribution of Head Office of Companies by Sector



Source: A Study on New Industrial Location Policy in the Era of the Fourth Industrial Revolution, 2017.12. KRIHS, pp 87.

Geographical distribution shows that the majority of the companies are located in the Seoul Metropolitan Area. In particular, the companies in all of the five sectors are highly concentrated in Seoul. More than 50% of the companies in the Seoul Metropolitan Area are in Seoul and the southern part of the Seoul Metropolitan Area.
Meanwhile, the companies in the five sectors are sparsely located in areas other than the Seoul Metropolitan Area. But a number of companies that produce robots and drones are exceptionally concentrated in and around large cities (Busan, Ulsan, etc.) outside of the Seoul Metropolitan Area. Major industrial clusters where companies in new industries are densely located include Teheran Valley (named after Silicon Valley of California) in the Gangnam-gu district of Seoul, Techno Valley in the city of Pangyo, Gasan-Guro Digital Complex in Seoul, and Daedeok Techno Valley in the city of Daejeon.
A comparison of reasons for location selection by the companies surveyed in each cluster shows that the companies in the Gangnam-gu district of Seoul cited convenient transportation and access to venture capital and financial institutions. The companies

in the Daedoek-Yuseong cluster said whether qualified human resources could be easily found was the most important for the selection of the company's location.

Comparison of Factors for Location Selection by Cluster

	Gangnam	Pangyo	Gasan/ Guro	Daedeok/ Yuseong	Total
Access to markets	3.71	3.33	3.87	3.38	3.59
Qualified human resources	3.93	3.33	3.67	3.69	3.69
Convenient transportation, logistic cost savings	2.50	3.44	3.33	3.56	3.20
Low rent	4.14	4.00	3.80	3.56	3.85
Cluster of peer companies	3.21	3.78	3.47	3.44	3.44
Convenient living circumstances including housing and education	3.57	3.56	3.80	3.38	3.57
Access to universities and research institutions	3.21	3.11	3.13	3.06	3.13
Access to venture capital and financial institutions	4.00	3.67	3.47	3.38	3.61
Access to legal, accounting, and consulting services	3.93	3.67	3.60	3.19	3.57
Corporate support services from local governments	3.29	3.44	3.53	3.38	3.41

Note: The survey question was "What are reasons for selecting the current location of your company? Please rate the importance of each factor." Each company rated the importance of each factor from "Very Low" (1 point) to "Very High" (5 points).

Source: A Study on New Industrial Location Policy in the Era of the Fourth Industrial Revolution, 2017.12. KRIHS, pp 89.

2) Analysis of Transaction Network

For the analysis of the transaction network of the companies in new industries, the spatial transaction network of those companies shows that 14.9% of transaction volume takes place in the same city and county where companies engaging in transactions are located. AI and big data was the sector where transactions in the same city or county of company location represented the highest portion of transaction value. Transaction counterparties of the companies in the AI and big data sector are concentrated near industrial clusters including Gangnam and Pangyo. Geographical distribution (by city, county, and district) of transaction counterparties of all the companies in the five sectors shows the largest number (256) of transaction counterparties are located in the Gangnam district of Seoul. Distribution of transaction counterparties by sector shows that while the transaction counterparties of most new companies are located in the Seoul Metropolitan Area, the companies in the robots and drones sector have relationships with transaction counterparties located mainly in Gyeongsang-do, outside the Seoul Metropolitan Area.

3. Analysis of Establishment and Transfer of Companies in New Industries

The survey on the companies in new industries shows that 78.7% (163) of them were established in their current location while 21.3% (44) were set up in other regions and then moved to their current locations. Major factors for location

selection are convenient transportation, low logistic costs and access to high-quality human resources. Considering that new industries are technology-intensive, the biggest issue was difficulties with finding experienced workers. The respondent companies said the most necessary support to strengthen corporate competitiveness was reduction of taxes and other charges.

Comparison of Factors for Location Selection by Cluster

	Gangnam
Reduction and exemption of taxes and other charges	44.0
Support for technology and R&D	21.7
Support for marketing and sales	6.3
Support for education, training, and facilities	0.5
Support for basic facilities including ICT	2.9
Corporate support services	1.9
Support for technological development and data	1.4
Support for expansion into overseas market	3.4
Support for business management and finance	12.6
Infrastructure including transport	0.5
Support for land and buildings	3.4
Others	1.4

4. Industrial Location Policy Implications in the Era of the Fourth Industrial Revolution

As part of policy measures suggested by this study, the supply of industrial sites in downtown areas should be expanded to nurture new industries while the clusters of companies in existing industries should be provided with government support based on zoning. This research also suggested multi-dimensional support in providing industrial sites, including increased supply of shared or leased industrial sites and small-sized industrial complexes and vertical factories, that consider demand for business sites by companies.

To nurture existing industries, large-scale industrial sites in the suburbs for mass production should be provided. Measures to supply customized industrial sites to companies in new industries should be prepared in consideration of their future expansion (growth and maturity stages of new industries) after the creation of the companies. For the revitalization of existing industries including higher productivity, the establishment of smart factories and smart industrial complexes was suggested. Remodeling projects to improve the production environment of existing industrial complexes and factories were also recommended. In addition, a comprehensive corporate support policy is needed, including corporate support measures to strengthen corporate competitiveness and programs to encourage the creation of start-ups.

Now is the time for Korea to take actions in terms of industrial location policies to continuously nurture or revitalize the manufacturing sector. Against this backdrop, this study has implications given its analysis of the impact of the Fourth Industrial Revolution on industry locations and suggestions on the industrial location policy for new industries.

The 4th KRIHS-IDB Urban Development Academy (KIUDA) for high-ranking government officials from LAC countries

GDPC at KRIHS hosted the opening ceremony for the KRIHS-IDB Urban Development Academy (KIUDA) for 17 high-level officials from 11 countries, jointly designed by KRIHS and the Inter-American Development Bank (IDB) at the Lotte Hotel in Seoul. This workshop is the fourth of the three-year program jointly organized by KRIHS and IDB. The KIUDA has the dual goals of building solid relationships between Korea and LAC countries and building the potential and capacity of urban development through knowledge exchange.
Among the program participants were the Vice Minister of Ministry of Habitat and Local Development of Dominican Re, the Executive President of the National Institute of Housing and Urban Development of Costa Rica, the Commissioner of National Commission of Housing and Human Settlements of Honduras, and another 14 high-ranking officials from 11 countries.
During the upcoming four-day program with lectures, site visits, and discussions, KRIHS, IDB, and LAC countries share Korea's territorial planning and urban and housing development experiences and discuss measures for future cooperation. The program is expected to be a great opportunity for developing strong mutual cooperation.

2018 KOICA-UNESCAP-KRIHS Capacity Building on Spatial Data and Technologies

From Oct. 29 (Mon) to Nov. 10 (Sat), GDPC of KRIHS, the Korea International Cooperation Agency
(KOICA), and the United Nations Economic and Social Commission for Asia and the Pacific (UN-ESCAP) cohosted the 2018 KRIHS-KOICA-UNESCAP Capacity Building program on spatial data and technologies for urban planning and disaster management.
The goal is to share Korea's knowledge of and experiences with urban disaster

prevention and management, disaster information sharing platforms, and prediction technology and GIS application for sustainable urban development. The participants were 19 government officials responsible for disaster management and spatial technologies in Azerbaijan, Kyrgyzstan, Tajikistan, and Uzbekistan. It is expected that this training program would be a good opportunity to develop capacity building measures in spatial technologies and establish networks between Korea and the participating countries.

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