

The Transformation of the Land

Historically, the Korean Peninsula has been called Geumsugangsan, which can best be translated into this poetic phrase: nature appearing as if it were embroidered on silk. Unfortunately, years of Japanese occupation and the subsequent Korean War divided and devastated the country in many ways. The nation's infrastructure and its industrial capability were destroyed as were numerous residential areas. This devastation led to a shortage of natural resources such as minerals, lumber, oil, and gas, which then triggered a collapse of the national economy, especially in South Korea. Until the early 1960s, Korea was forced to focus on recovering from the devastation of war by utilizing international aid to restore public facilities and rebuild the national economy. For the last 60 years, there have been many changes in the Korean landscape, most of which have stemmed from government-led land development projects, urbanization, and industrialization.

The government's master plan for land development was put into action in the early 1960s. At that time, the government based its plan on the growth pole theory in order to maximize the development effect in as short a period of time as possible. Though well-intentioned, the growth pole approach only allowed for investment in the few central development areas that were most likely to succeed before development could be considered in other areas. This approach had the unfortunate result of causing both people and capital to flow to those few development centers. The resulting imbalance between those centers and all other areas in the country was later corrected with the implementation of a more balanced set of development policies.

Under the Special Area Development Project, Seoul, Incheon, and Ulsan were selected as Special Areas to be developed first on the premise that the effects

of such development would gradually enfold the surroundings areas. The Industrial Park Development Project began in Ulsan and Seoul in the early 1960s. Also, during 1960s and 1970s, the Industrial City Construction Project was launched with targeted sites near such industrial parks. This led to the emergence of major chemical industries concentrated in cities such as Ulsan-si, Yecheon-si, Pohang-si, and Gumi-si with a concordant rise in population in each of these cities.

Urban migration, the nuclearization of families, the increase in national income, and more widespread expectations for a higher quality of life all led to soaring demands for housing in the 1980s and 1990s. The housing supply rose to keep pace with the demand: In 1950, the number of housing units was 3,280,000; by 2011 it had increased five-and-a-half times to 18,130,000. The housing supply rate exceeded 100% by the year 2000. The increase in housing was also a result of many housing-related development policies, such as the Modern Housing Construction Project, the Two Million Housing Construction Project, the Rental Housing Construction Project, and the New Town Development Project. In rural areas, the Saemaeul Project and the Rural Living Environment Program were also implemented.

The transportation sector of the Korean economy rapidly developed as a result of the Export Industry Policy. This was reflected in land spatial structure and regional growth structure that centered on metropolitan areas and the Gyeongbu Axis (Seoul-Busan). Korea's entry into modern transportation actually began with railways that the Japanese built to invade Korea and seize its resources during the colonial period. In 1955, diesel engine locomotives and a subway system were introduced while double-track railway projects were also promoted. The modernization of rail traffic has been ongoing, and in 2004 the Seoul-Busan High

Speed Railway began operation. The development of highways began with the construction of the Gyeongbu Expressway in the 1970s, and since the late 1980s more and more roads have been built and improved as the number of cars has soared and the volume of road traffic has increased. Marine transportation is mainly used for overseas transportation rather than domestic purposes. Major ports of Korea are primarily located along the southeastern coast, which allows for the ready import and export of materials and products needed for chemical industrial plants located in the same region. In 2006, the Busan New Port began operation and has become the center for international marine transportation.

Air traffic development began with the construction of airfields built for military purposes during Japanese colonization. Gimpo Airport opened in 1958 and Jeju Airport began operations in 1968. Korea's air transportation has opened a new chapter with the opening of the ultra-modern Incheon International Airport on Yeongjong Island in 2001.

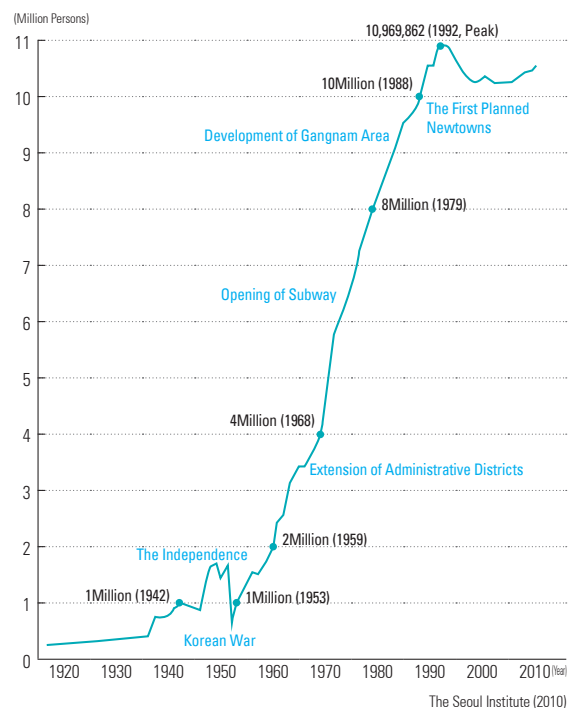
Other major development projects from the 1970s to the present include a number of natural resource and energy related projects such as reforestation, land reclamation, multipurpose dam construction, and nuclear power plant construction.

Urbanization has had major impacts on the country's demographics, its physical landscape, its social-behavioral institutions, as well as the economy. Symbols that represented cities on the national map kept increasing, and as the number of cities increased, the population of rural areas declined, which also led to a decrease in the percentage of the population that was engaged in agriculture and fishery activities. New cities kept appearing on the national map as larger metropolitan areas continued to expand into rural land surrounding them.

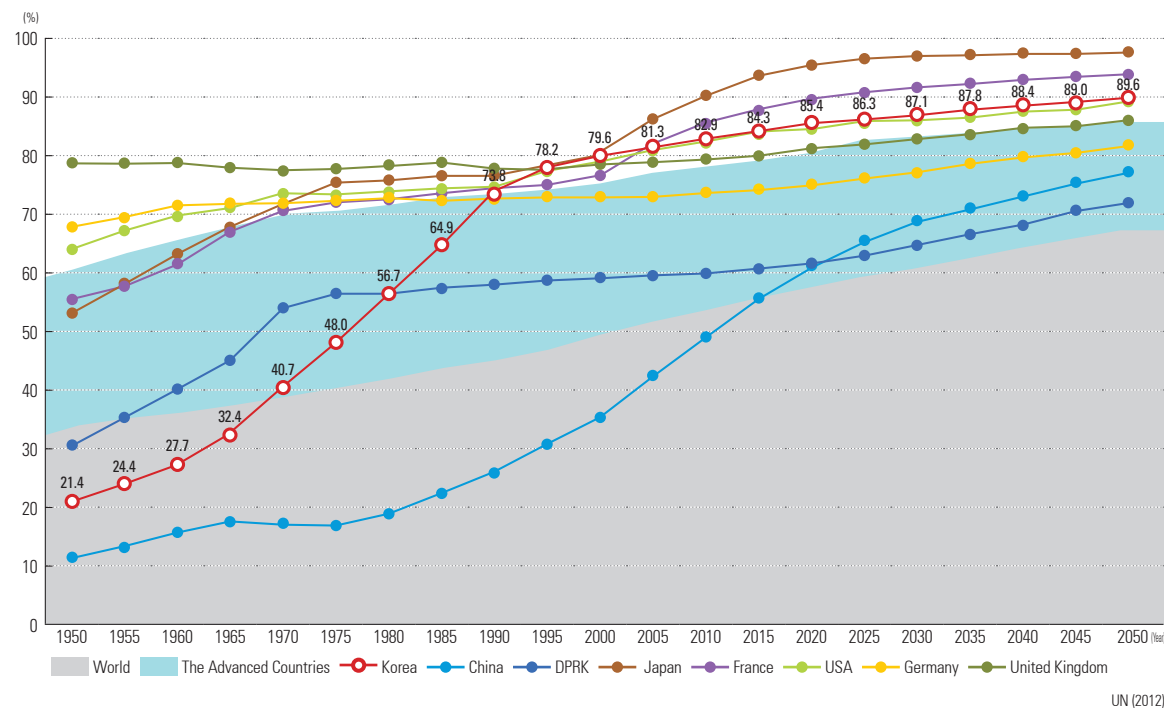
The emergence of metropolitan centers is a major feature of development in Korea and resulted primarily from the rural-to-urban migrations, especially in the capital area. After the 1960s, rapid urbanization and industrialization attracted secondary and tertiary industries to cities as well. More jobs were created prompting further mass migrations from rural to urban areas. The urbanization rate, which indicates the ratio of urban population as a percentage of the total population, increased rapidly in Korea until the 1980s, but the pace has slowed since then. Between the 1970s and 1980s urbanization occurred at a much faster rate than in many other countries. As a result, rural areas suffered from the lack of a labor force, a decrease in the coefficient of land utilization, and the rapid aging of its population; these factors ultimately contributed to the failure to meet the minimum requirements for sustaining a rural community in many instances. And at the same time urban areas were confronted with the need to mitigate the challenges of overcrowding. Additionally, the heavy concentration of industrial activity within the metropolitan areas resulted serious social and environmental issues such as housing shortages, traffic congestion, poor air quality, and overall environmental degradation.

There was a clear trend toward excessive expansion in both the capital area and the port cities surrounding the Southeastern Maritime Industrial Region. The expansion between these two regions is related mainly because industrialization took place along the Gyeongbu Axis. Seoul experienced excessive increases in population, but this trend has stalled and decreased since 1990s. The population of nearby satellite cities, however, keeps growing, which results in a population concentration in the greater metropolitan area with Seoul at its center.

The Growth of Seoul



The Urbanization Rates in the World



The Development of Transportation Infrastructures



The Transformation of the Land Space

Major Land Development Projects

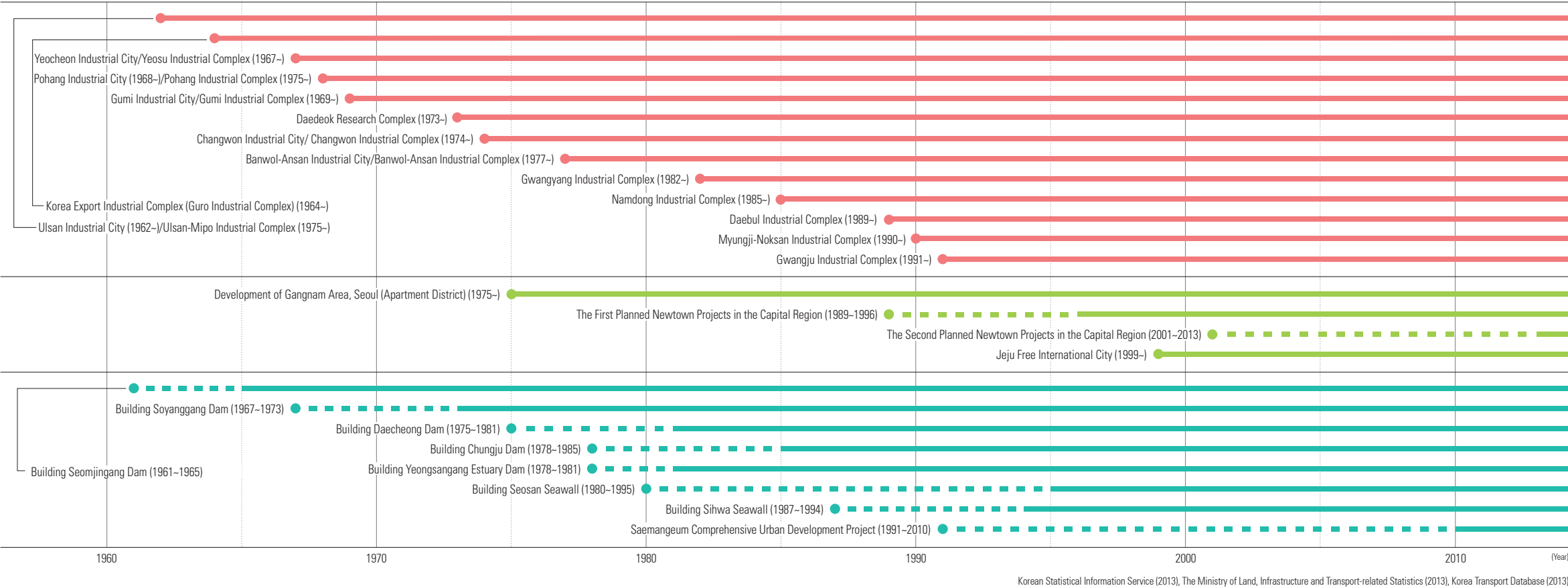


Since the 1960s, the South Korean government has fostered economic growth through export by building both industrial complexes and new cities. Beginning with the Ulsan Industrial Complex, which was completed in 1962, and the Korea Export Industrial Complex (Guro Industrial Complex) in 1964, many industrial complexes and their adjacent cities emerged in and around Yecheon, Pohang, Gumi, Incheon, Changwon, Banwol (Ansan), and elsewhere from the late 1960s through the 1970s.

As economic development gained momentum in the 1960s, the transportation infrastructures were rapidly built to support the transformation. The most notable project was the 428 km Gyeongbu Expressway which connects Seoul with Busan. Construction began in 1968, and the expressway opened for service in 1970. It serves as the main corridor through the country. Construction of the Gyeongbu High Speed Railway between Seoul and Busan began in 1992, and it was completed in 2004, which enabled commuters to travel from point to point anywhere in the country within one day-an advancement hailed as “a half-day life zone.”

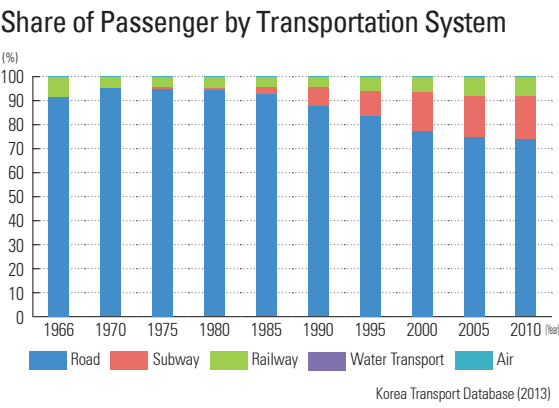
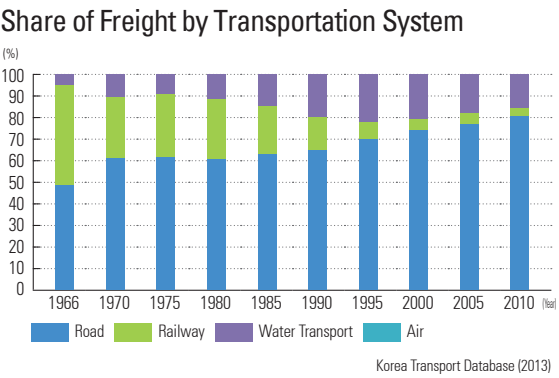
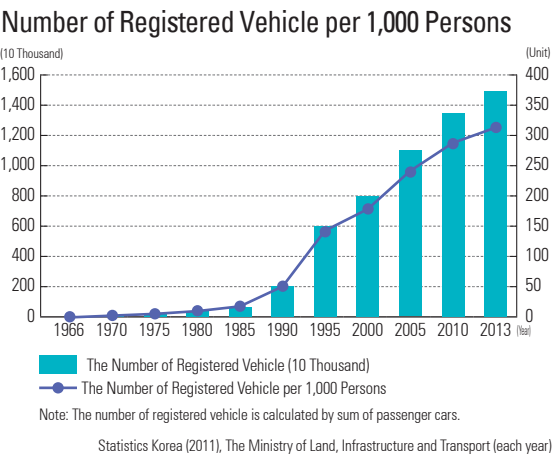
The importance of water as a resource was recognized in the 1960s; thus, the multi-purpose Seomjingang Dam was built in 1965 across the Seomjin River. More multi-purpose dams were built straight through the 1970s to the 1980s; the Soyanggang Dam, Daecheong Dam, and Chungju Dam are notable examples. All possess hydroelectric power generation capabilities. In 1978, Korea’s first nuclear power plant, the Gori Nuclear Power Plant No. 1, was built and began operating near Busan. Subsequently, more nuclear plants were built in Wolseong, Uljin, and Yeonggwang.

Major Land Development Projects Timetable

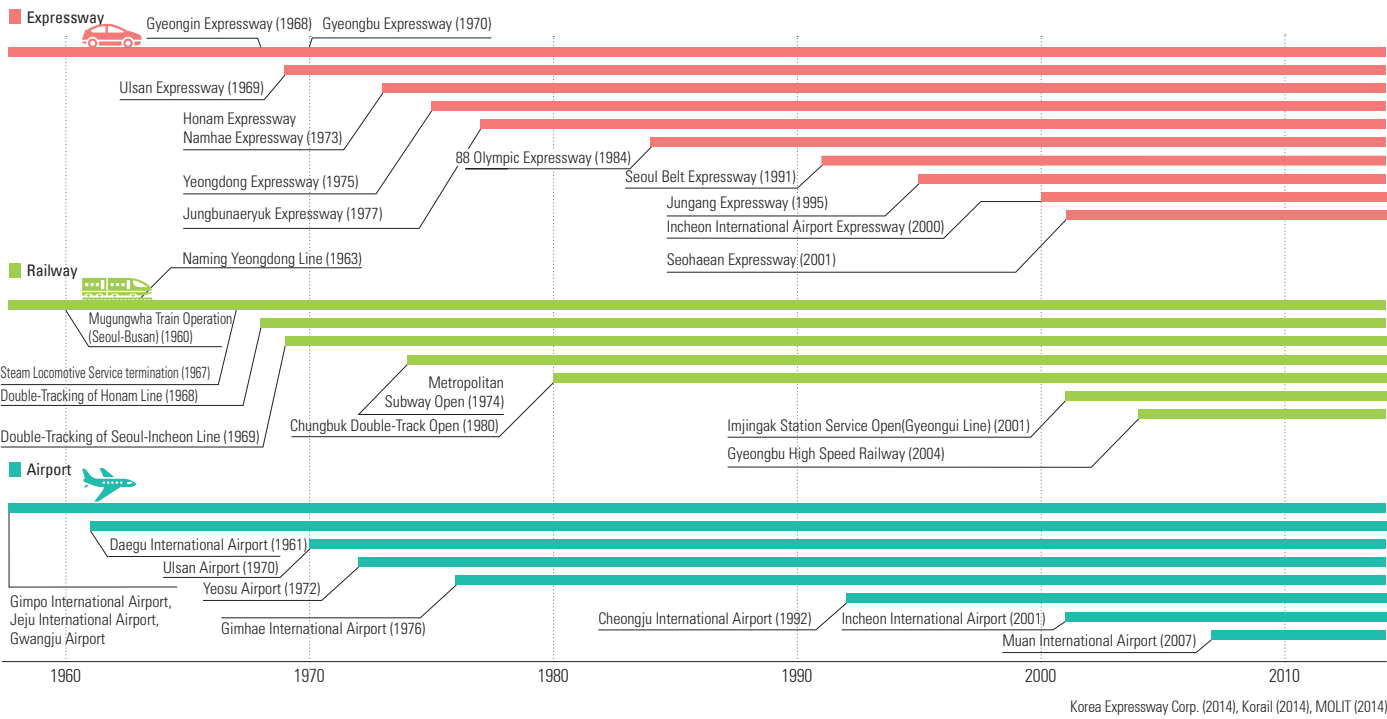


The Development of Transportation and Communication

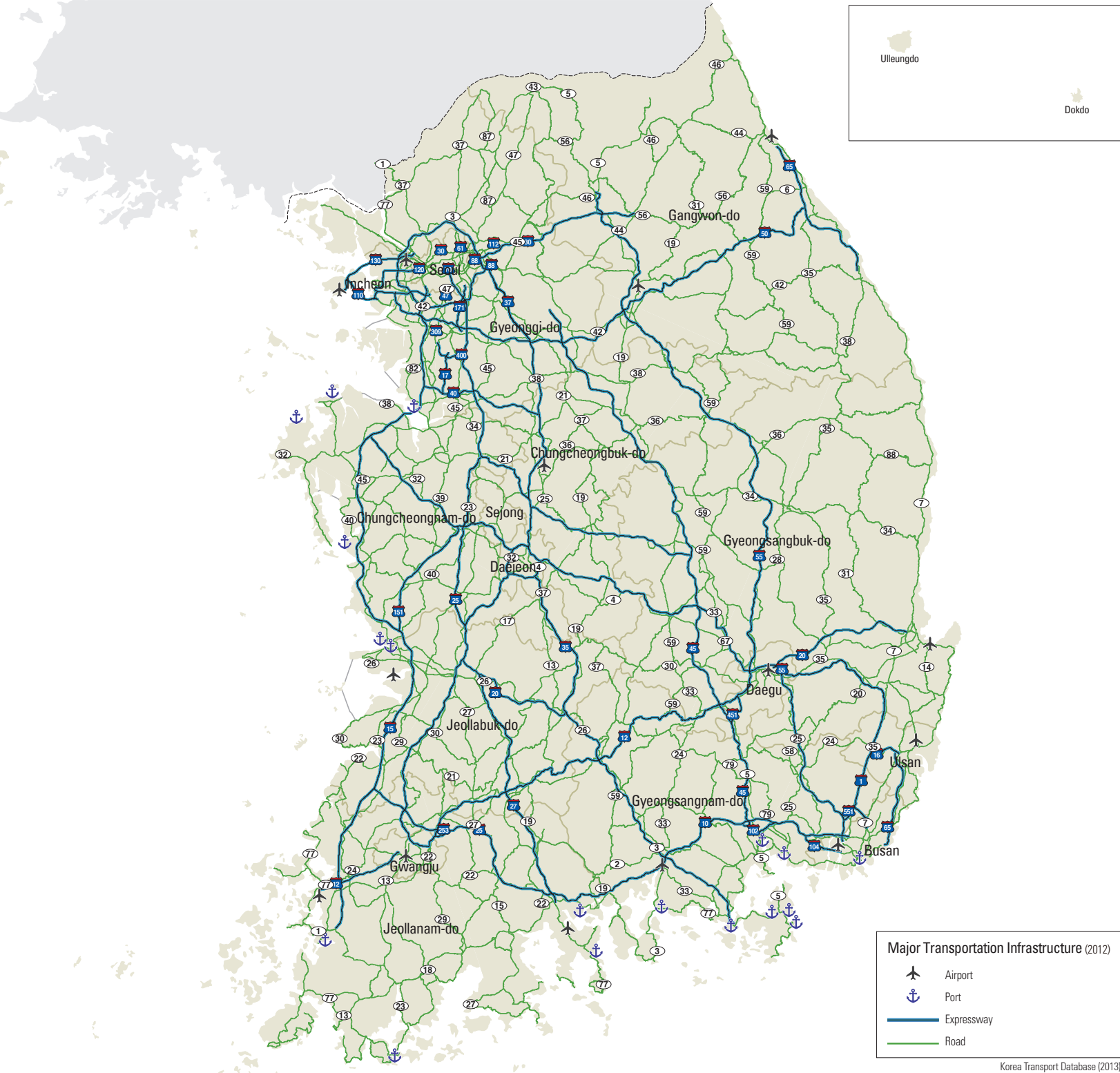
Since the 1960s, construction of transportation infrastructure took place rapidly, and major national networks such as expressways, railways, airports, and seaports were built and served as the backbone for continued transportation expansion. Numerous important industries were developed along the Gyeongbu Axis, and in order to service those industries a main transportation network was established to connect Seoul with Busan. With the opening of Gyeongbu Expressway in 1970, the entire nation became more accessible to commuters, making it possible for travelers to move from point-to-point in the country within one day (“One-day Life Zone”). With the opening of Gyeongbu High Speed Railway in 2004, it became even more so. Literally, a “Half-day Life Zone” became available.



Major Transport System Development



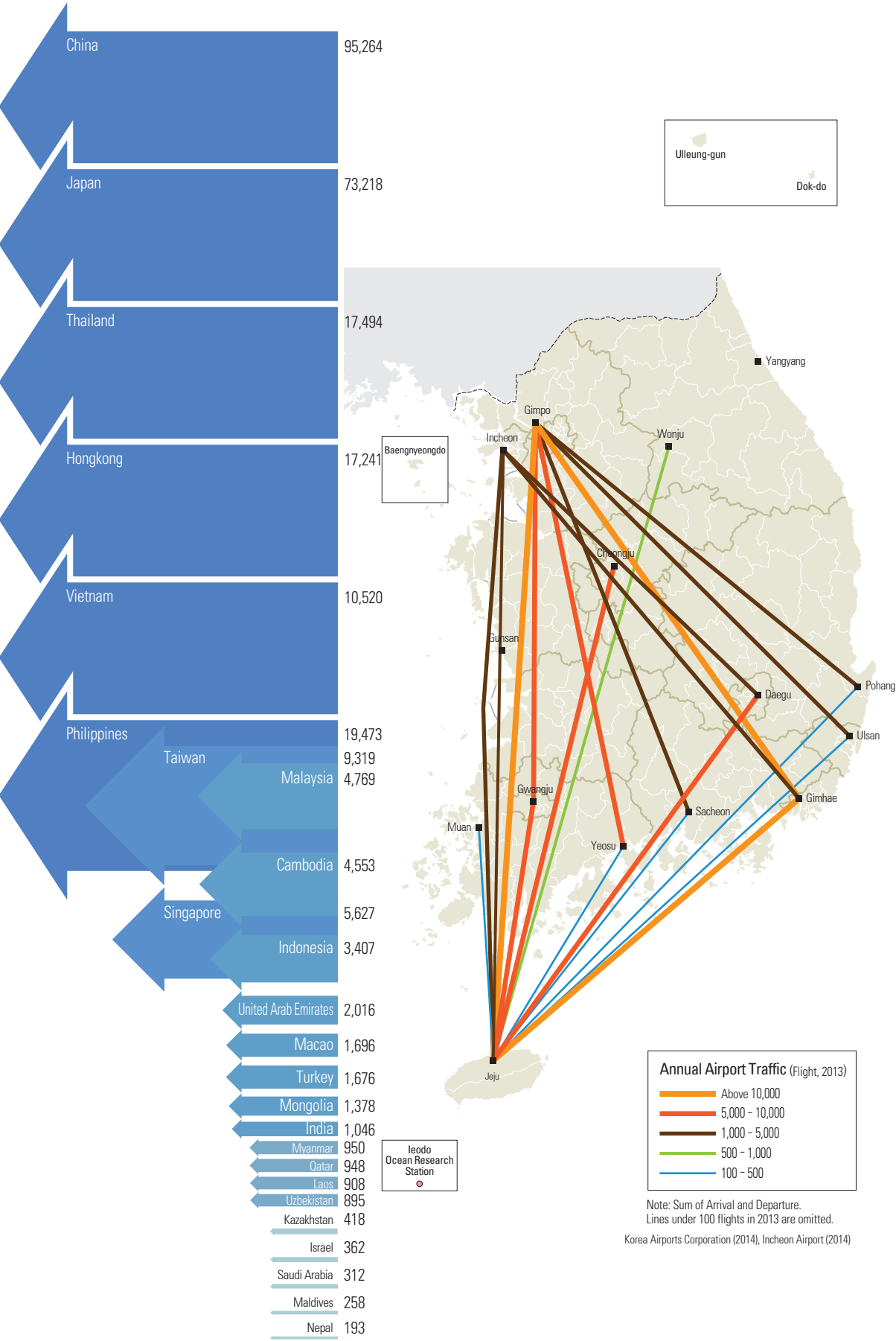
Major Transportation Infrastructure



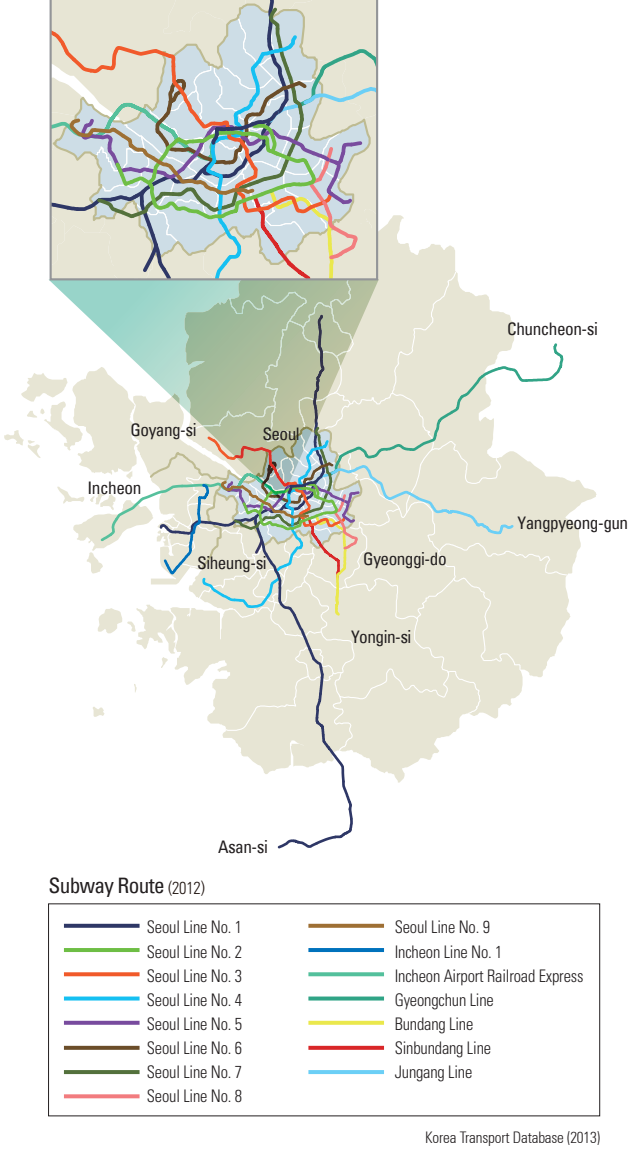
Major Railway



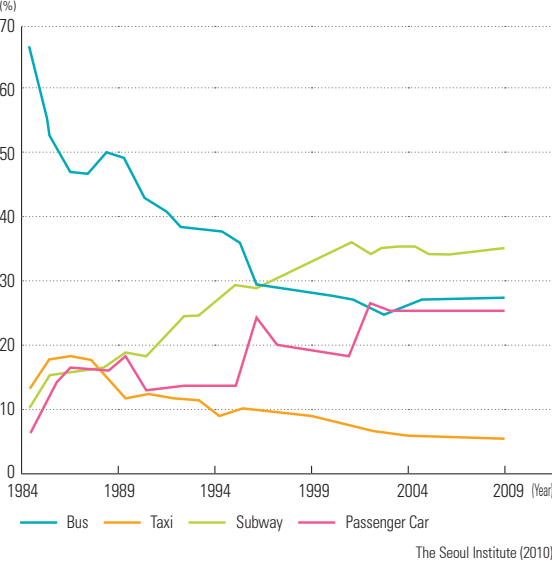
Airport Traffic



Seoul Metropolitan Railroad Map

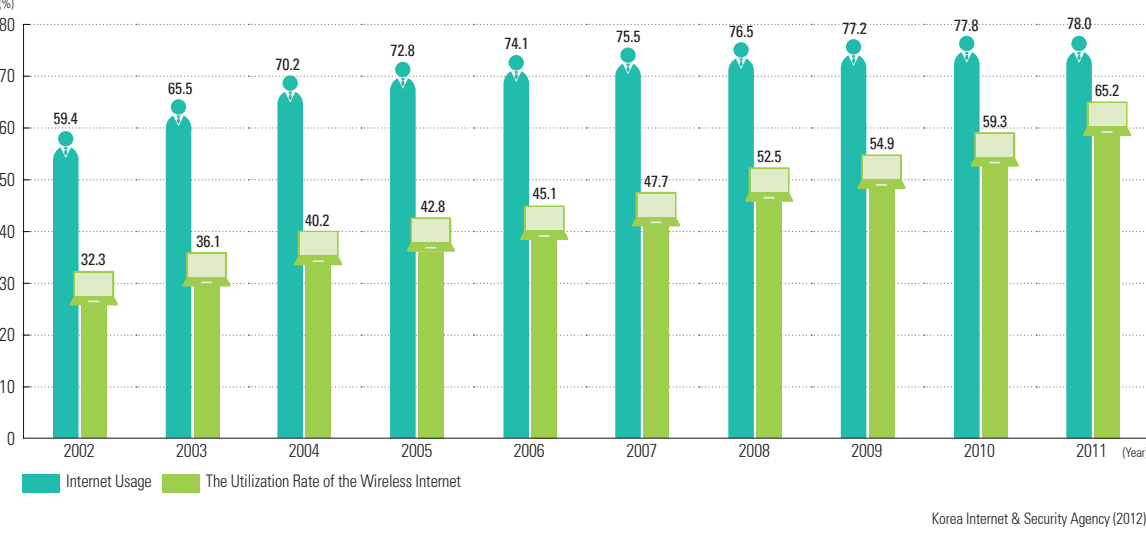


Share of Transportation by Transit System

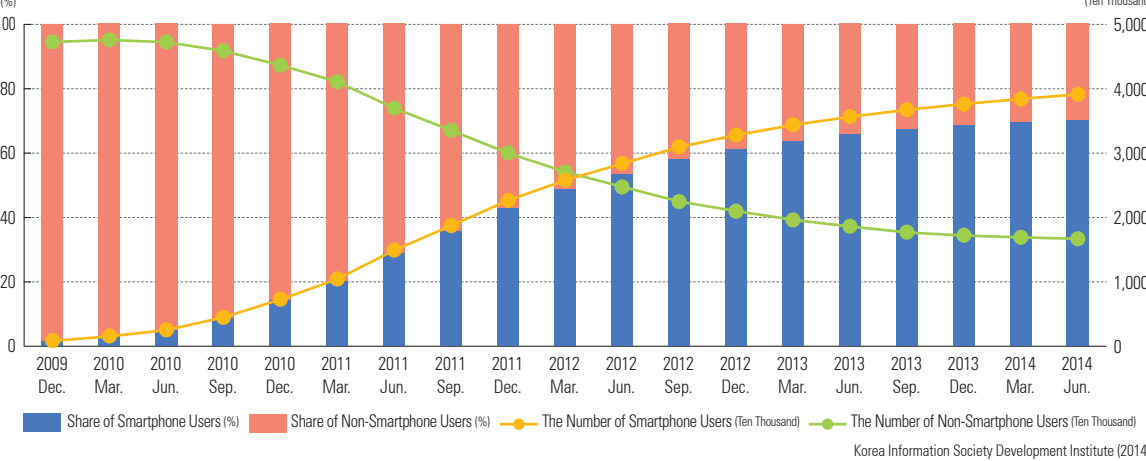


As computers are more widely used, communication through diverse digital devices has continued to grow. The development of the Internet, in particular, has made a massive amount of information accessible to people using computers, cell phones, and tablets. Unlike in the past, the bilateral exchange of information is taking place in a diverse and complex manner. The local telephone companies, which were the most important communication providers in the past, have been steadily losing subscribers dropping by 20% between 2004 and 2012. Simultaneously, the number of mobile phone subscribers has continued to increase by as much as 46% during the same time frame. Among mobile phone subscribers the use of smart phones has soared. Since 2012, the number of smart phone users has exceeded that of regular mobile phone users, and the customer market share of smart phone providers has exceeded 50%. As of 2011, 78% of South Korea's population has access to the Internet and 65.2% uses wireless Internet. The number of wireless Internet users has also dramatically increased due to the widening distribution of smart phones.

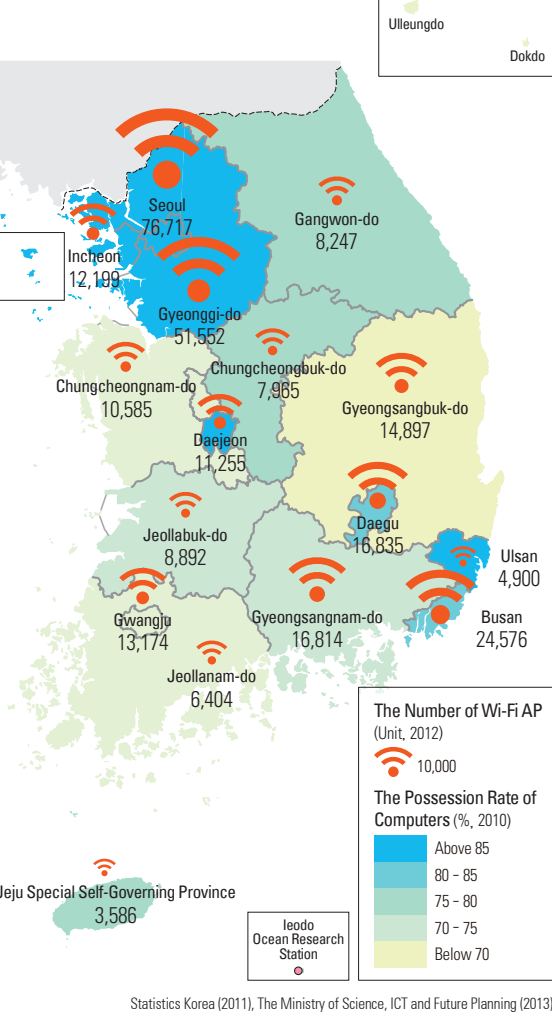
The Utilization Rate of the Internet



The Growth of Smartphone Users

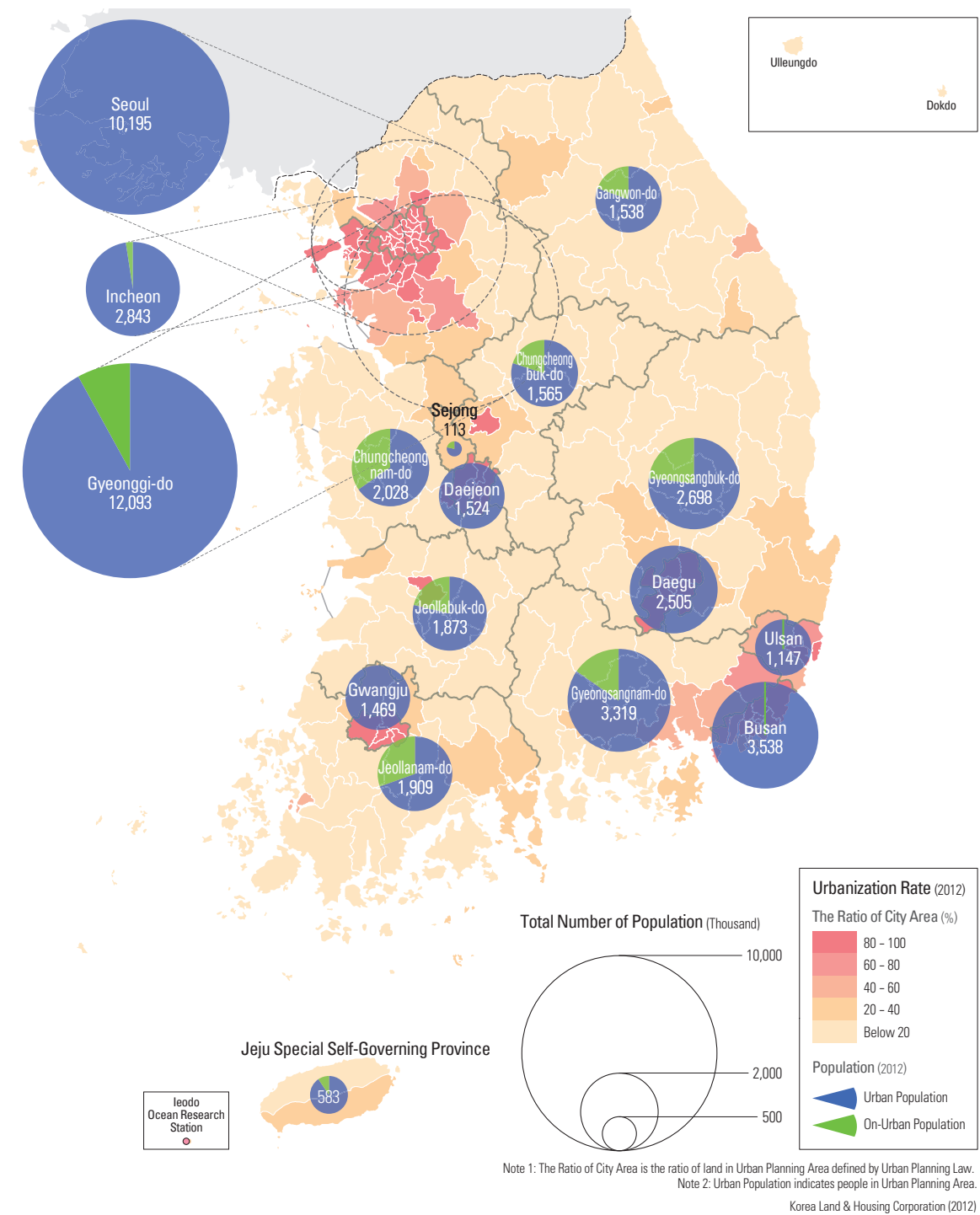


The Possession Rate of Computers and the Number of Wi-Fi AP

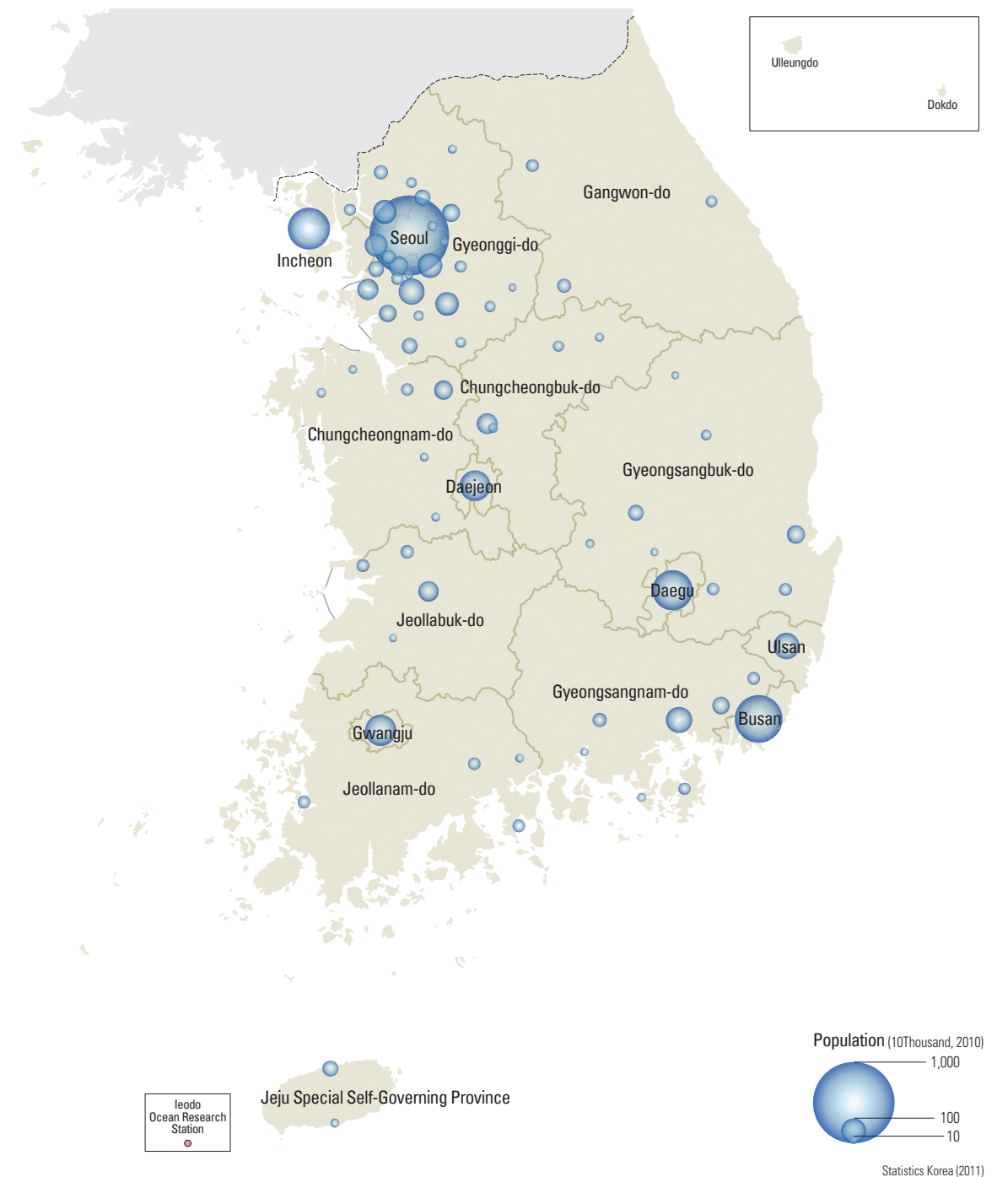


Urbanization and Living Space

Urbanization in Korea



The Spatial Pattern of Cities by Population Size



The most notable change in Korea's landscape over the past 60 years is increasing urbanization. The representative indicator of this process is the urbanization rate that shows the share of people living in urban areas out of the total national population. This statistical number can differ depending on which administrative level unit, the Dong level or the Eup level, is used to designate an area as urban or rural. According to the Eup level, Korea's urbanization rate has exceeded 90%. The

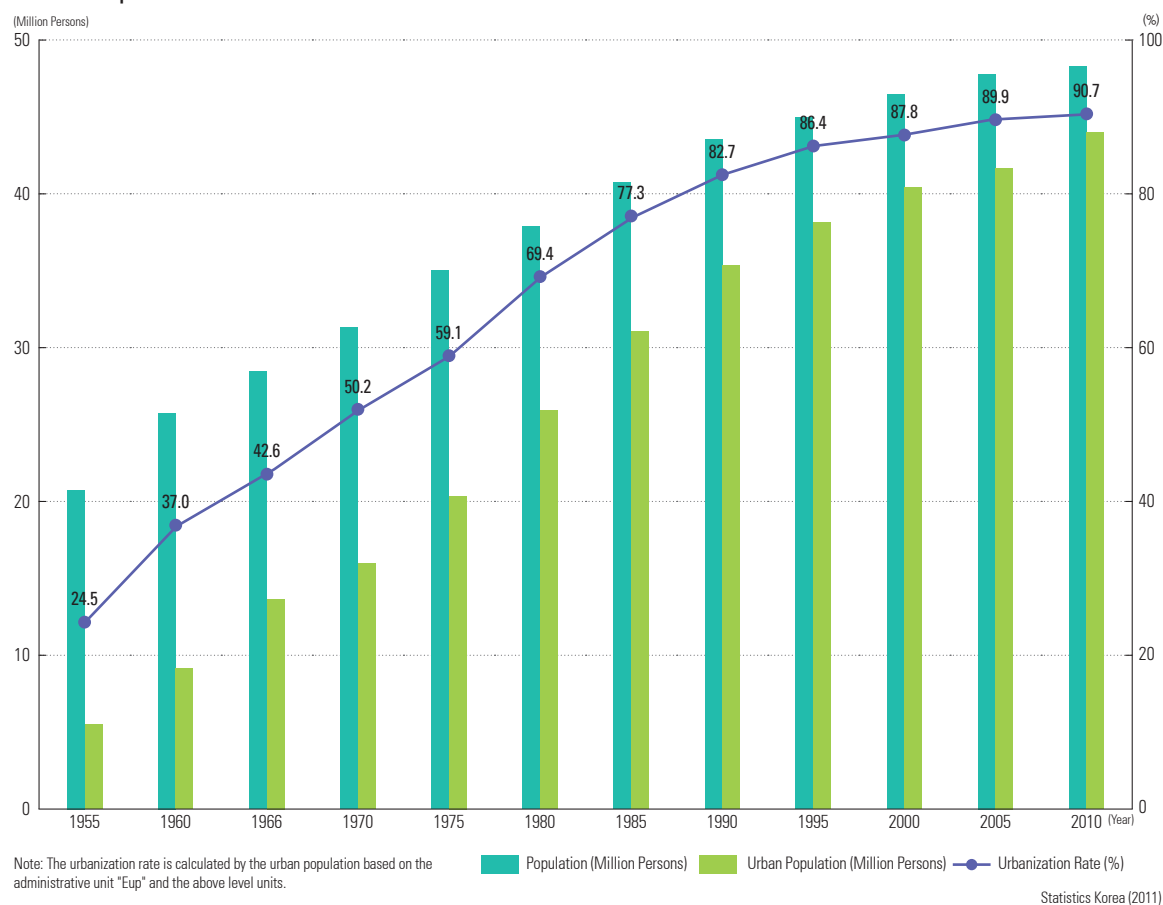
rate of increase was rapid until the 1980s, but it has since slowed down. This slowing trend indicates that Korea's urbanization has entered its final phase from the earlier acceleration phase. The capital area surrounding Seoul, Busan and its surrounding area, and other metropolitan cities all show high urbanization rates.

The list indicating urban growth in Korea when each city reached 1 million residents is shown here in chronological order: Seoul (1953), Busan (1955),

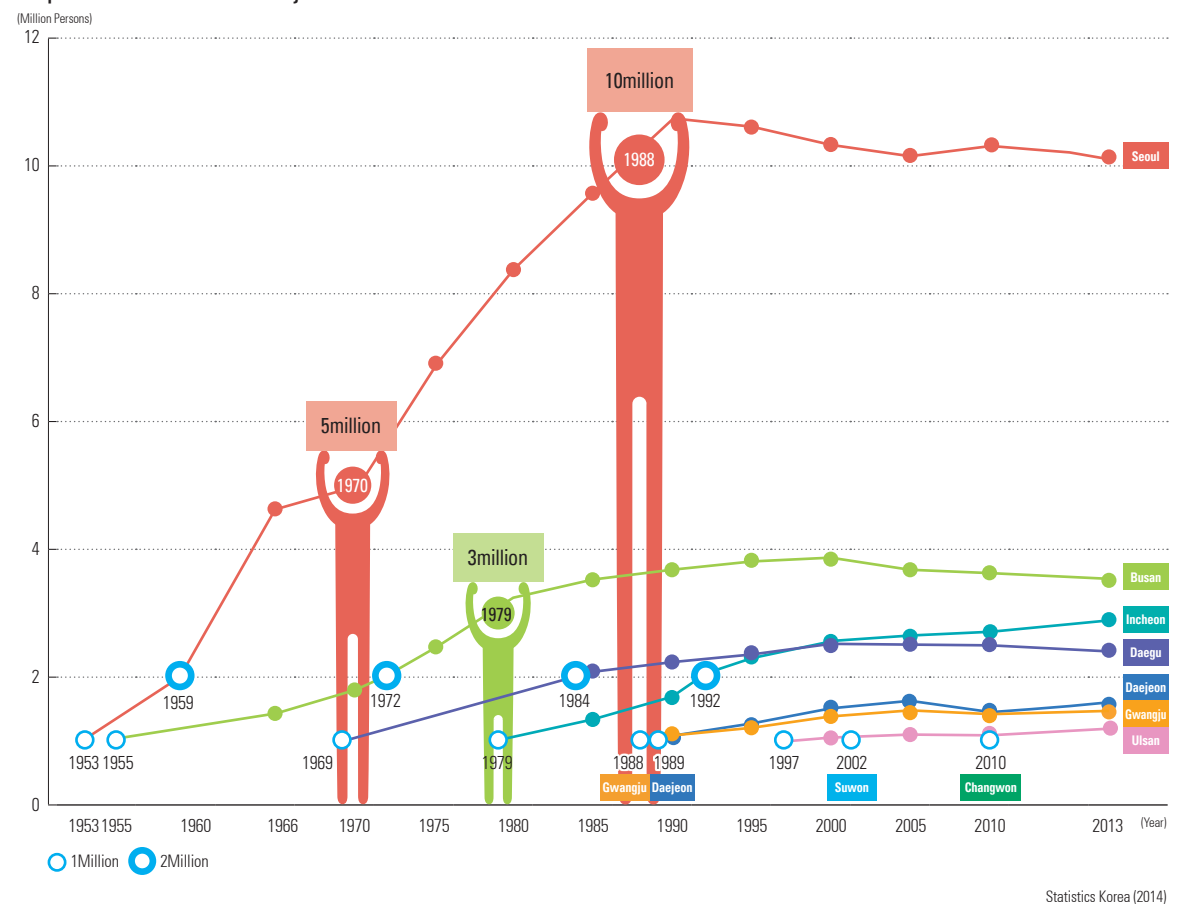
Daegu (1969), Incheon (1979), Gwangju (1988), Daejeon (1989), and Ulsan (1997). As for cities that did not meet the metropolitan definition, Suwon-si exceeded 1 million in 2002 and Changwon-si in 2010; Goyang-si and Seongnam-si are likely to follow. Seoul exceeded 10 million in 1988 and became a megacity even by international standards. Busan, the second largest city, exceeded 3 million in 1979; however, its population stagnated and has decreased recently. The distribution of cities

by population size shows a clear trend of port city development along the southeastern coastal industrial zone as well as the expansion of the greater capital area. These two urban centers in particular gave rise to the Gyeongbu Axis.

Urban Population and Urbanization Rate

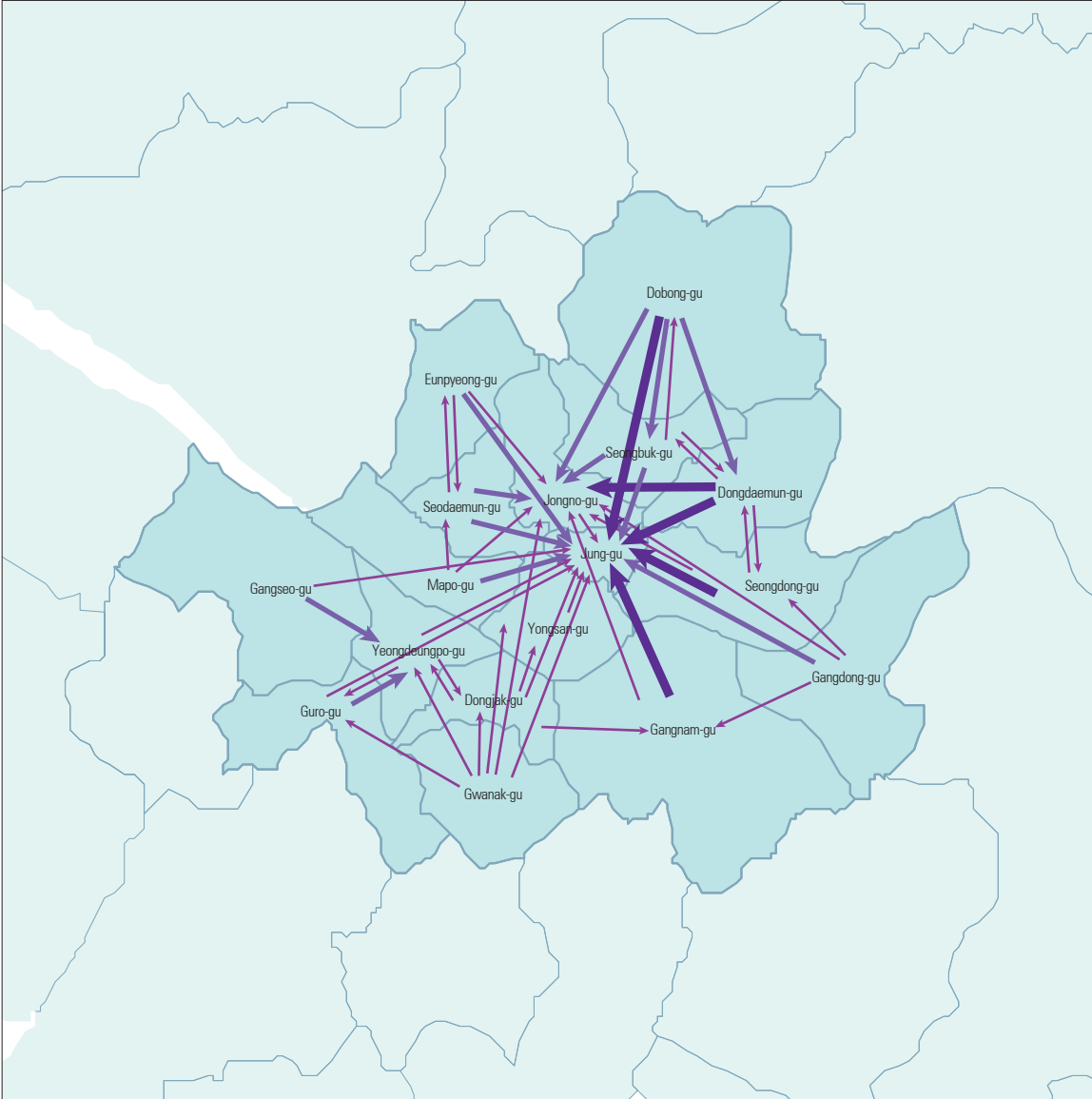
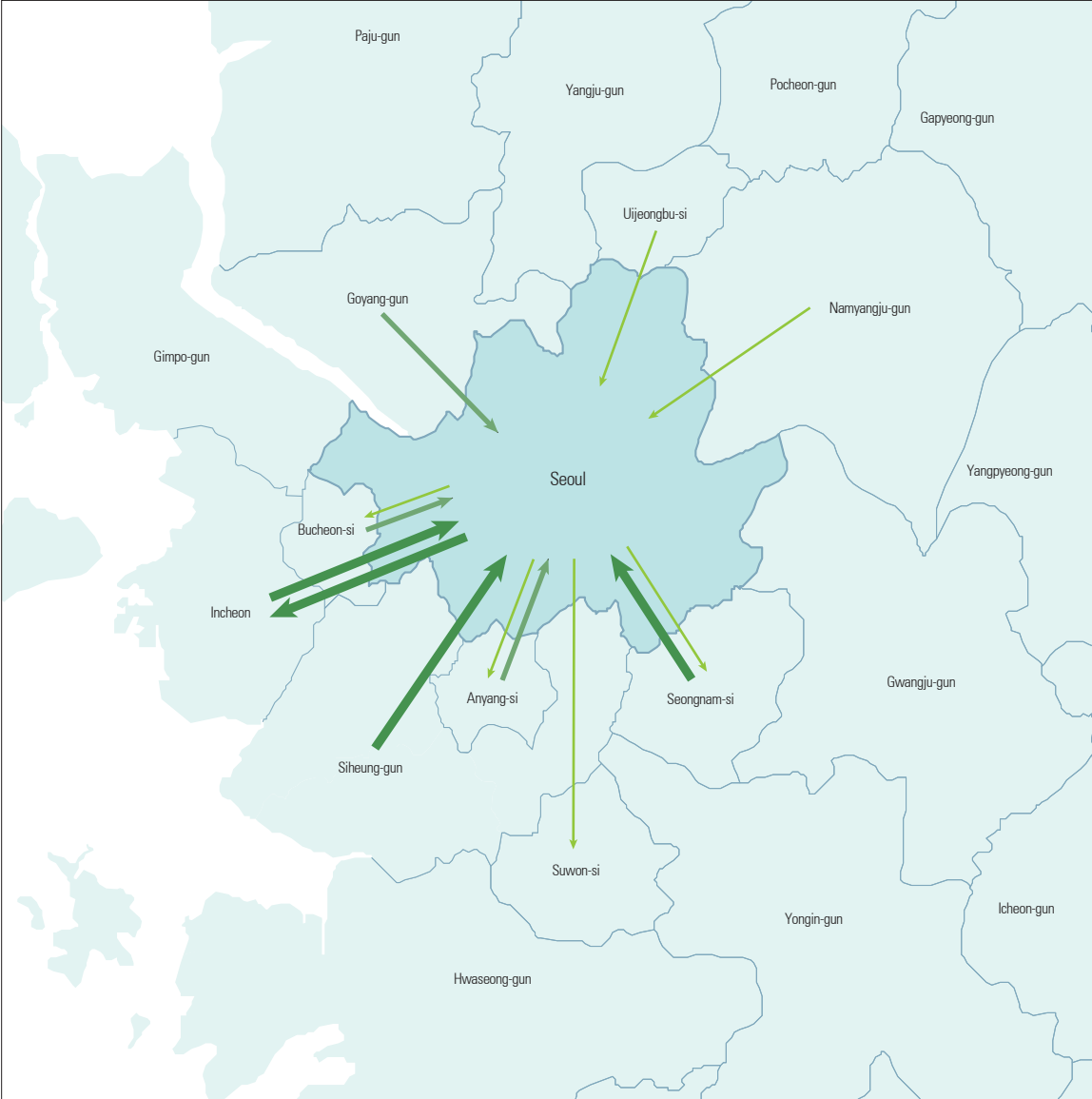


Population Growth of Major Cities

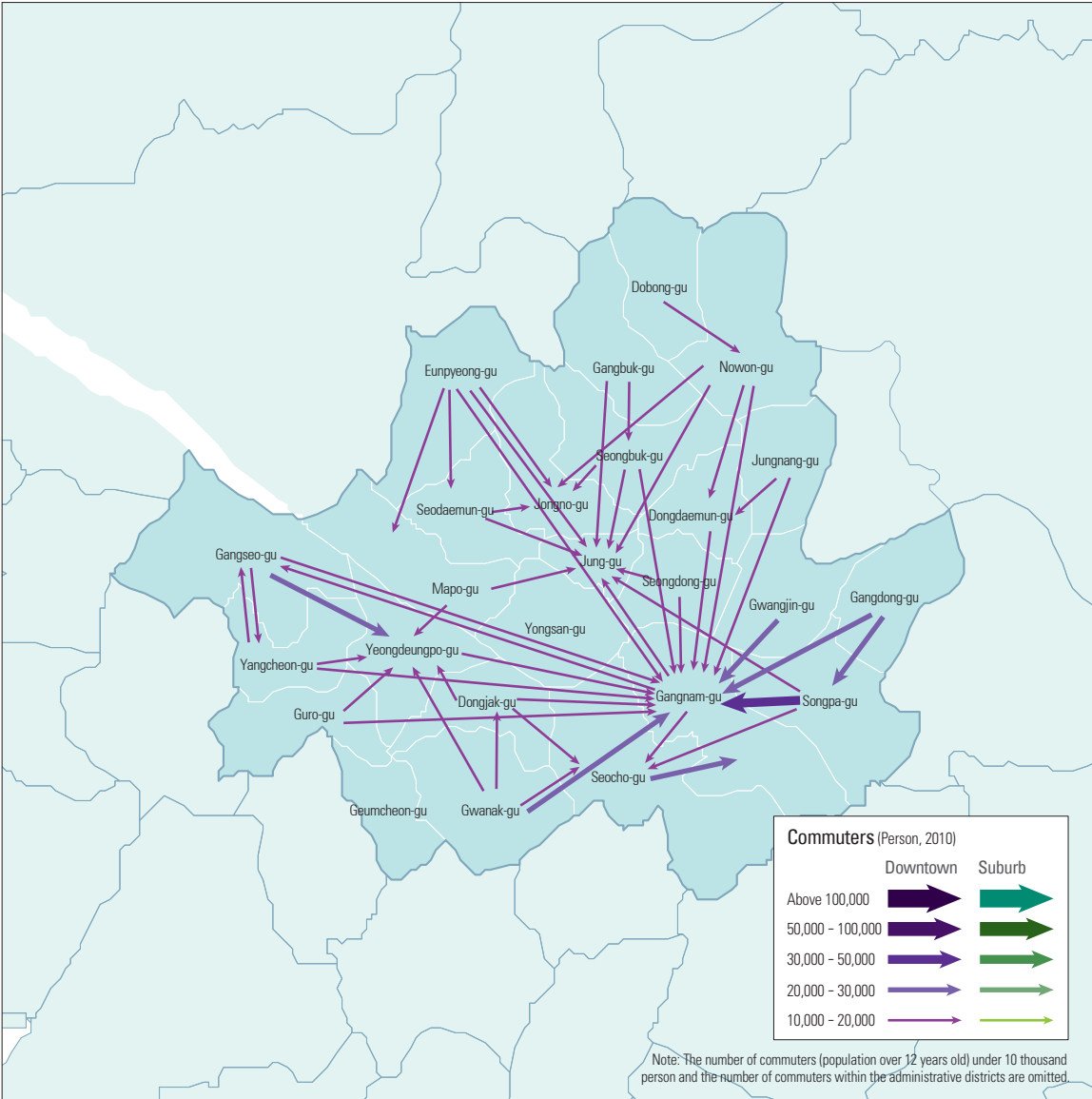
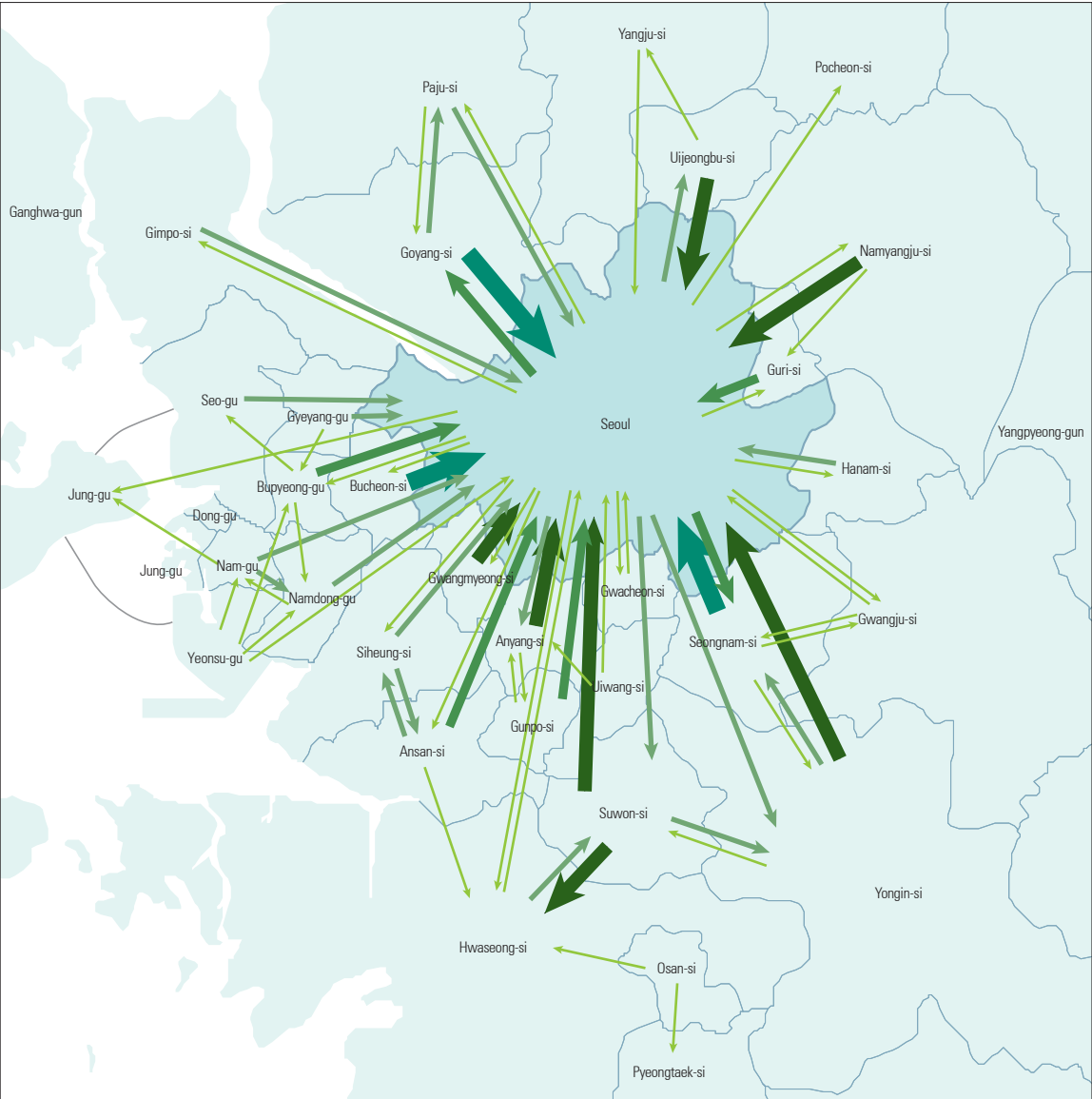


The Growth of Commuters in the Capital Region

1980



2010



Statistics Korea (2011)

The advent of a population increase led to urbanization, both in terms of the increase in the overall number of cities as well as their expansion. In addition, as urban residents moved into the suburbs, urbanization expanded into nearby regions forming greater metropolitan areas. As cities expand, so does the demand for housing and transportation infrastructure; there is likewise a concordant increase in the number of people commuting to and from work or school in the city centers. In the case of the Seoul metropolitan

area, the number of commuters from Incheon and Gyeonggi-do to Seoul was 239,000 in 1980; this number increased to 669,000 in 1990, to 1,072,000 in 2000, and to 1,423,000 in 2010. The number of people who commute from Seoul to its suburbs has also increased from 152,000, to 336,000, to 527,000, and to 572,000 during the same period of time. The number of commuters within Seoul has increased significantly as well as that of commuters between the city and the larger province. In 1980, as many as 3,109,000

people commuted to work or school within Seoul, but that number has gradually increased from 4,680,000 in 1990 to 5,257,000 in 2010. The number of people commuting to work or school within Incheon has increased from 343,000 in 1980 to 644,000 in 1990, and again from to 983,000 in 2000 to 1,237,000 in 2010. In particular, the number of people commuting to work or school within Gyeonggi-do has increased considerably from 937,000 in 1980 to 1,768,000 in 1990, and again from 3,441,000 in 2000 to 5,111,000 in 2010. City

buses provided the primary mode of transportation for almost 50% of those people commuting to work or school in 1980, but the percentage of people using the city bus system decreased to less than 20% of the total commuters in 2010 since the means for commuting has become increasingly diversified due to the construction of subway systems and increases in the use of personal transportation. In 2010, approximately 18% of commuters in Seoul relied on the subway systems for their daily travel.

THE TRANSFORMATION AND DEVELOPMENT OF THE LAND

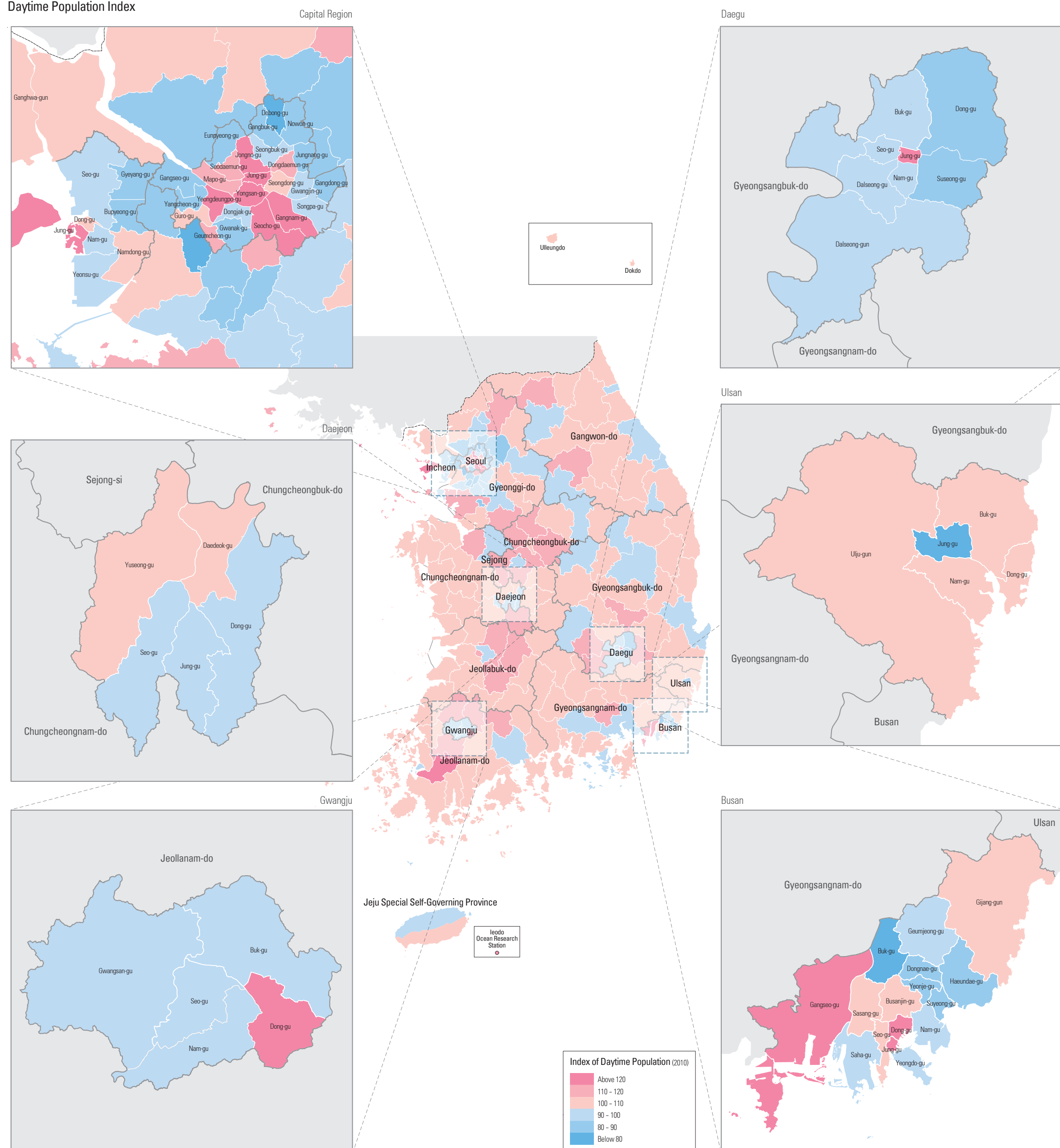
Statistically, the daytime population of a city is calculated by adding the incoming population to the resident population and by subtracting the outgoing population. The daytime population index is a ratio of daytime population as a percentage of the total resident population. The number of employees or commuters

in a certain area is included in the day population, and is calculated using the data of the commuting population. If this index is over 100, the area could be considered a commercial and business district, which means the population is concentrated there only during the daytime. If the index is lower than 100, it indicates

the area is residential which means the nighttime population is larger than daytime population. In the case of Seoul, two of its central business districts, Jung-gu (348.1) and Jongno-gu (238.7), each have a daytime population that is significantly higher than its resident population (as of 2010). The daytime

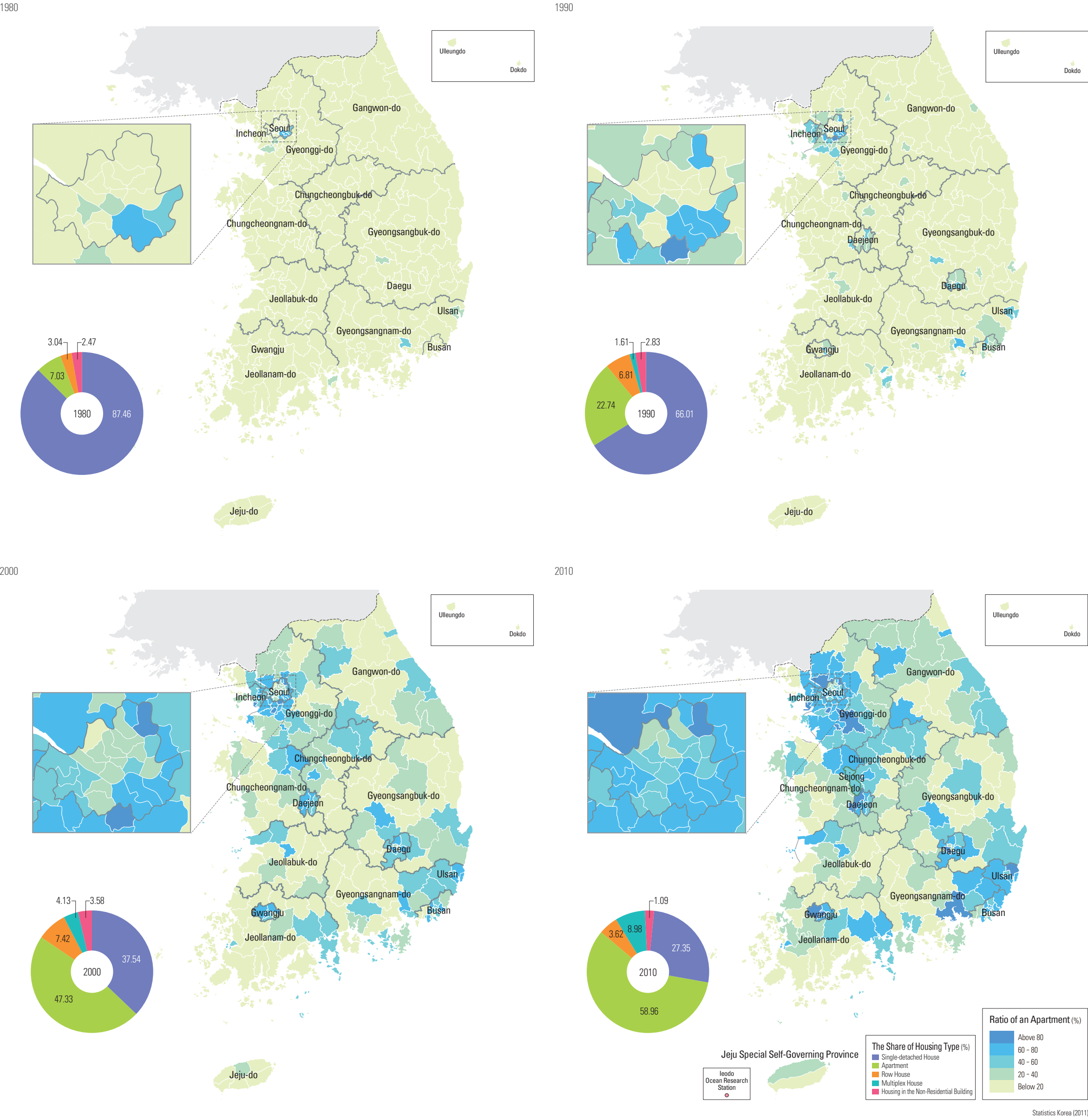
population index is closely linked to urban problems, and as the gap between the day population and night population becomes larger, it results in further the phenomenon of inner-city decline.

Daytime Population Index



Statistics Korea (2011)

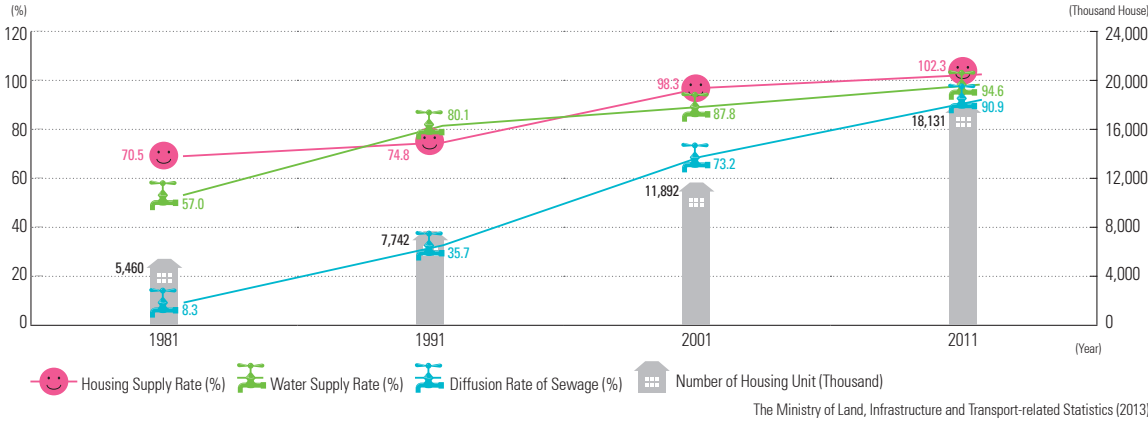
Housing Type and The Change of Apartment Share



As Korea's population grew, the demand for and supply of housing units have both increased as well. The housing supply has soared since the 1980s, exceeding 10 million housing units by the year 2000. The housing supply rate exceeded 100% by 2008. Traditionally, the dominant housing type was single-detached dwellings; however, these have been outnumbered by apartments, thus increasing the

apartment residence rate significantly. The single-detached dwelling ratio was 87.5% in 1980, which dropped to 27.3% by 2010. During the same period, the apartment ratio has increased from 7% to 59%. The supply of apartments varies by region, and the trend shows that the supply is mainly concentrated in the capital and metropolitan areas rather than in nonmetropolitan areas.

The Development of Residential Infrastructure



Spatial Planning

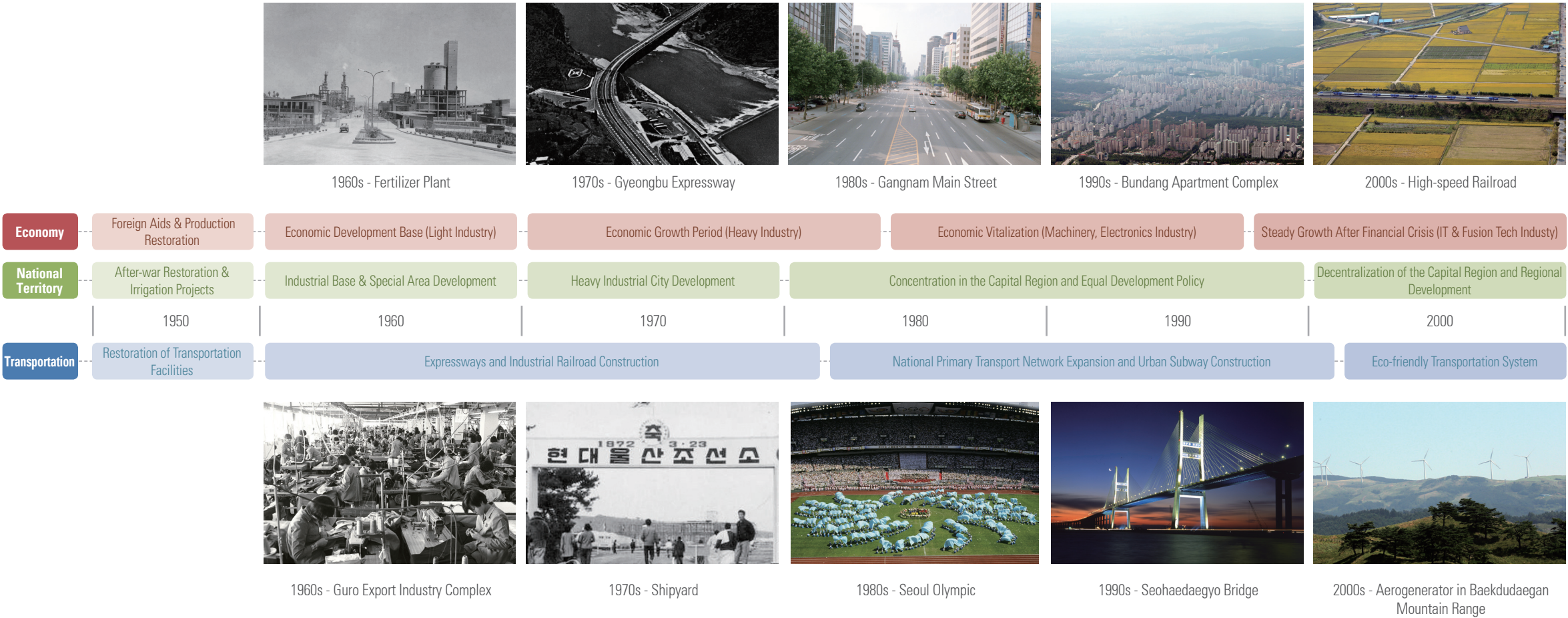
Spatial planning in Korea has been greatly advanced with the development of the national territory since 1960. Spatial planning is the standardized and refined framework that is utilized to maximize the efficient use of Korea's territorial land and water bodies. Spatial planning is also a key component in the Comprehensive National Territorial Plan (CNTP), regional development plans, and comprehensive city/county plans. The intent of spatial planning is to seek balanced approaches to land development, to enhance the competitiveness between regions, and to pursue the

environmentally-friendly management of land. More specifically, the CNTP is a master plan to efficiently manage territorial land resources in a manner that is compatible with the basic direction and underlying strategies of national policies. The first CNTP (1972-1981) was implemented in 1971; it was followed subsequently by the second CNTP (1982-1991), the third CNTP (1992-2001), and the fourth CNTP (2000-2020). With the rapid economic growth and urbanization in Korea the national development progressed in an unbalanced manner, and in order

to narrow the development gap between regions, various regional development plans have been carried out. Plans such as Enterprise City, Innovative City, and Multifunctional Administrative City have been designed and implemented. More recently, a five-year regional innovative development plan has been executed with the aim of promoting local economic self-reliance through regionally specialized development. Additionally a district development promotion plan has also been applied to areas that remain significantly underdeveloped. A culture and

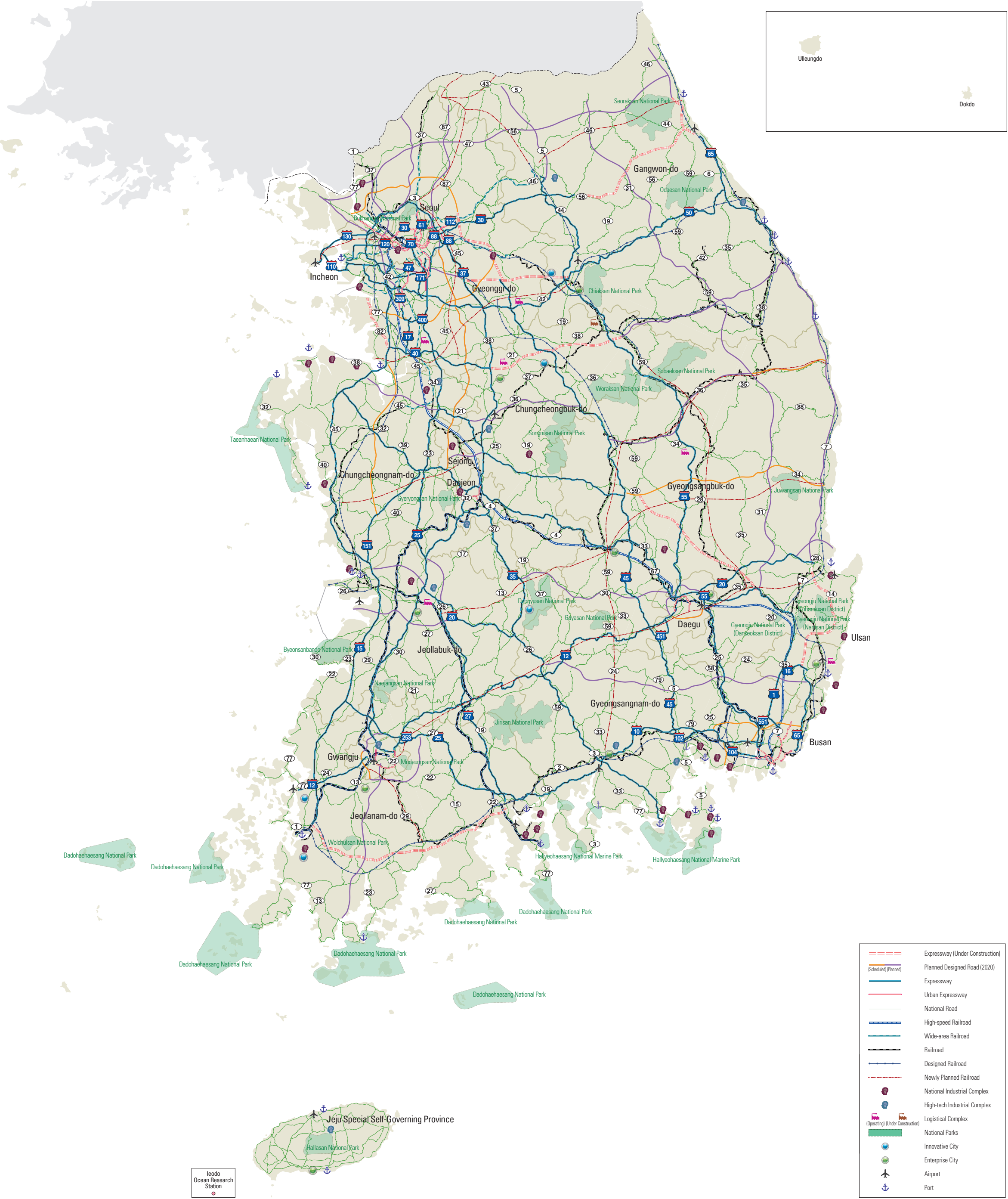
tourism development plan has also been prepared to help foster more distinctive regional development projects. Another crucial element of Korea's spatial planning system is the urban planning system, which was designed to be compatible with the CNTP. The urban planning system encompasses area-wide regional plans, city/county master plans, city/county management plans, and district unit plans.

Changing Economic and Social Conditions and the Land in Korea



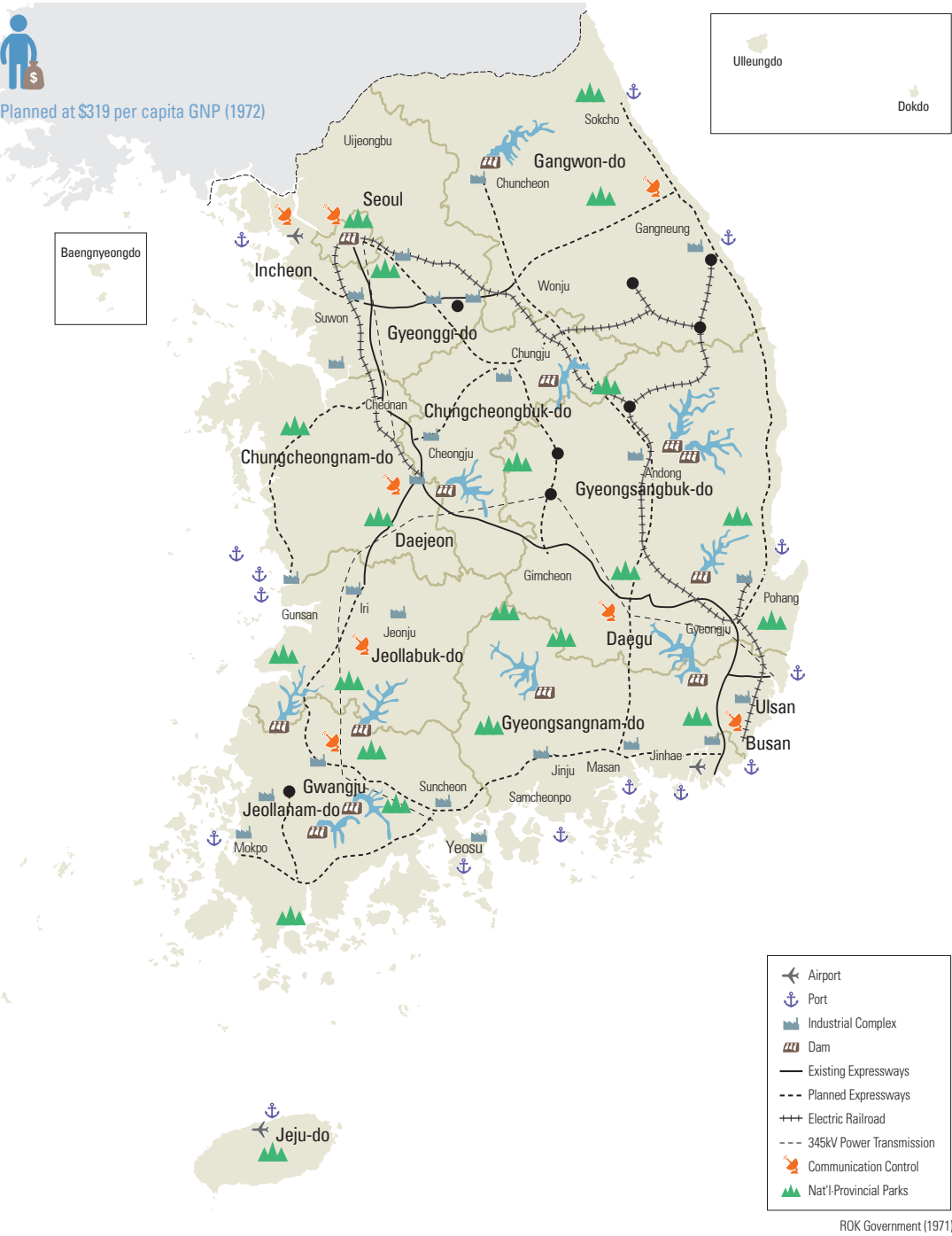
National Territorial Planning

4th Comprehensive National Territorial Planning



THE TRANSFORMATION AND DEVELOPMENT OF THE LAND

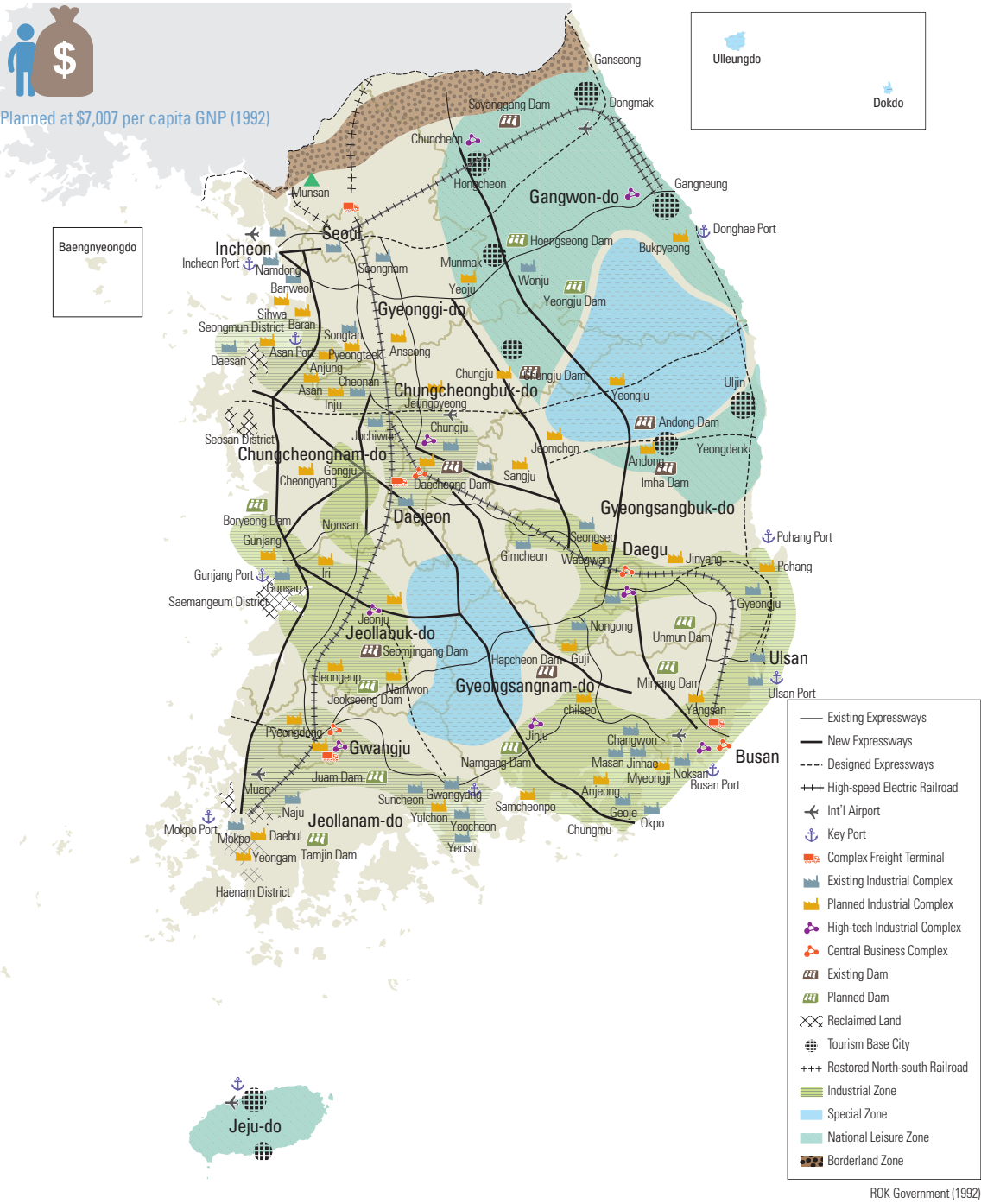
1st Comprehensive National Territorial Planning (1972~1981)



2nd Comprehensive National Territorial Planning (1982~1991)



3rd Comprehensive National Territorial Planning (1992~2001)



The goals of the First Comprehensive National Territorial Plan were straightforward and focused primarily upon cultivating the effective use of the national territory, expanding social overhead capital, developing natural resources, protecting the environment, and improving the quality of life. These goals were aimed at fostering economies that could in turn facilitate the accumulation of wealth, a process that relied upon a nationally-led growth pole development strategy to assist in developing smaller regions. The plan's main development strategy was predicated upon investing in large-scale industrial complexes, building supply chains for the transportation, communication, and energy industries, and strengthening the economic status of backward regions.

The Second Comprehensive National Territorial Plan aimed to implement a multi-pronged spatial plan to redefine the nation's territory for development in a manner that would help to achieve regional and life zone balance. This Plan specifically controlled the growth of two big cities, Seoul and Busan, expanded social overhead capital to backward regions, and further fostered the development of those as yet undeveloped regions by designating them as promotion areas. In order to facilitate more balanced development and settlement in specific local areas, the Plan dispersed or relocated medium-sized industrial complexes to those areas deemed to have potential for growth. It also established industrial areas in regions that possessed favorable geographical conditions for development, and it pursued economic growth by

connecting and integrating existing concentrations of industries to intra-regional industries.

The Third Comprehensive National Territorial Plan applied multi-pronged development and regional economic bloc development strategies with the intention of continuing to invigorate underdeveloped regions in Korea. Specifically, the Third plan reduced the degree of concentration of industries in metropolitan areas, increased small and medium-sized industrial complex development in underdeveloped regions, and regulated new industrial complexes in metropolitan areas. It also attempted to spur the voluntary relocation of major companies to the provinces to help foster the redistribution of the population away from the congested urban centers. The plan also focused on upgrading the industry-related infrastructure of the southeast coastal industrial belts. It also contained revised environmental legislation, and it expanded express transportation networks between metropolitan areas and the more newly developed industrial areas.

The Fourth Comprehensive National Territorial Plan reflects the integrated national territory of the twenty-first century. It seeks to realize a globally-oriented national territorial structure and to promote globally competitive cities based on "Wide Area Economic Zones." To achieve this goal, the Fourth Plan established a national supra-economic network of regional axes which linked wide area economic zones as well as the coastal areas with inland areas and further linked the three coastal areas and the border area between South and North Korea.

National Railroad Network Plan (2011~2020)



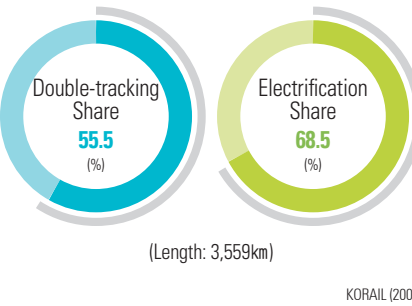
National Principal Road Network Plan (2011~2020)



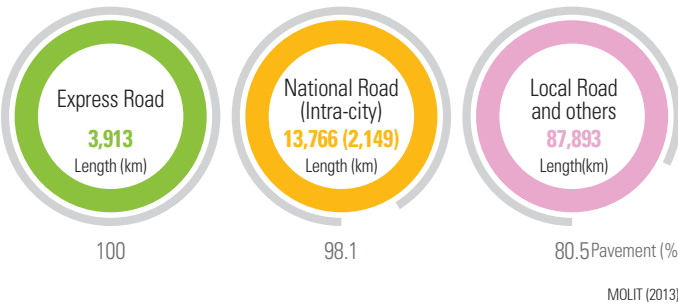
Until 2000, the focus on improving the nation’s transportation infrastructure resulted in major road construction projects that linked key nation-wide routes. After 2000, the focus shifted toward maximizing traffic efficiency and improving the overall balance in regional development. Continued investments in the national transportation infrastructure have provided the foundation for increasing Korea’s

overall transportation capacity. The framework of a national level arterial road system has now been established. As for railroad efficiency improvement, people can now travel from one side of the country to another within a quarter of a day after the Gyeongbu High Speed Railway began operation in 2004. International air travel has also been greatly facilitated after the Incheon International Airport opened in 2001.

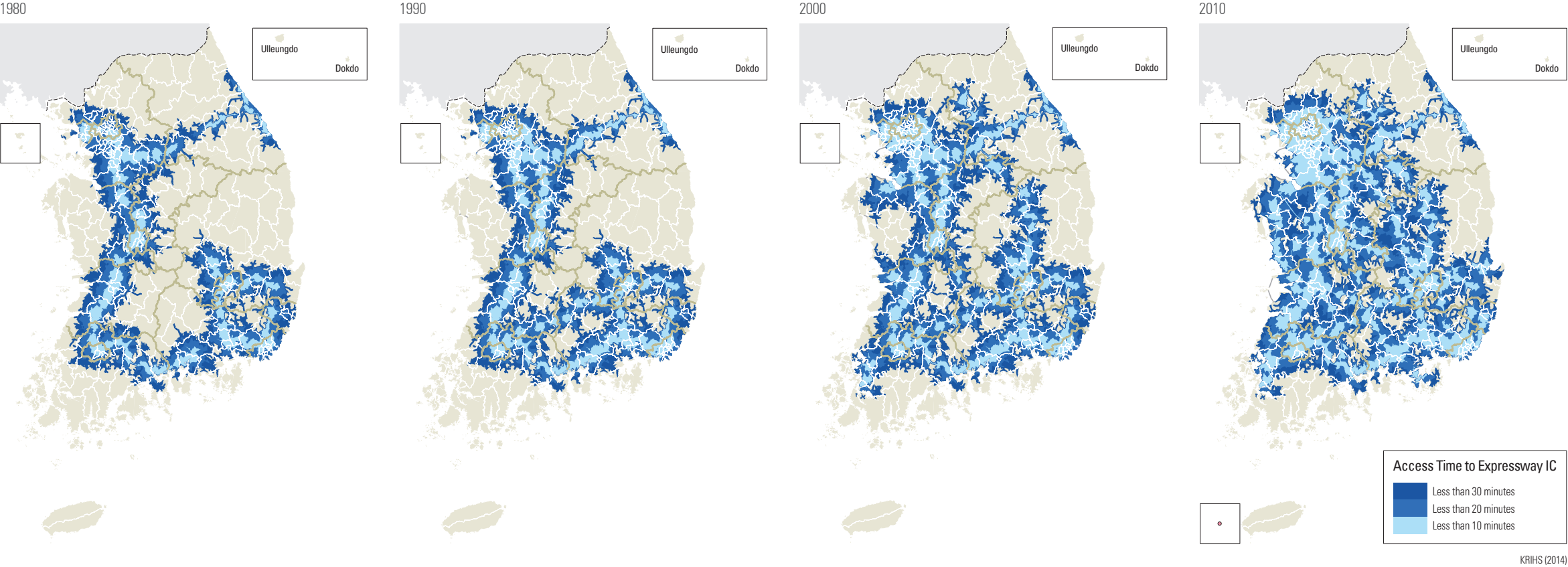
Double-tracking and Electrification of Railroad



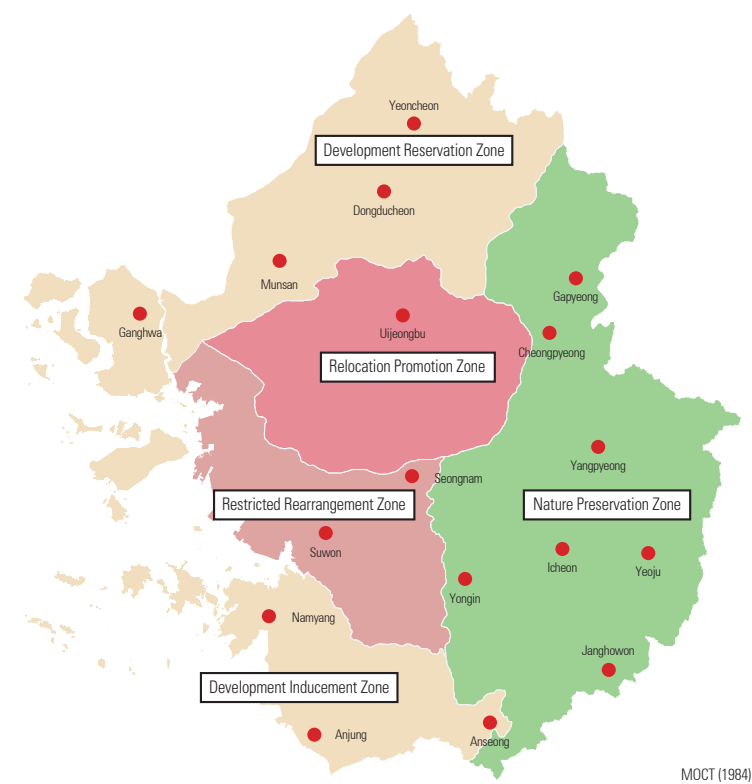
National Road Status



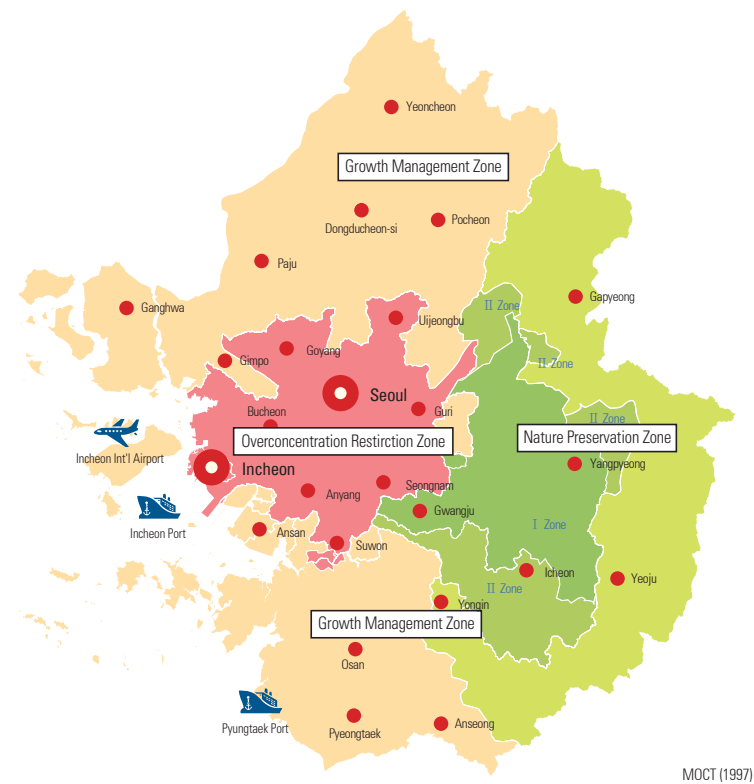
Regions Accessible to Expressway IC Less than 30 Minutes



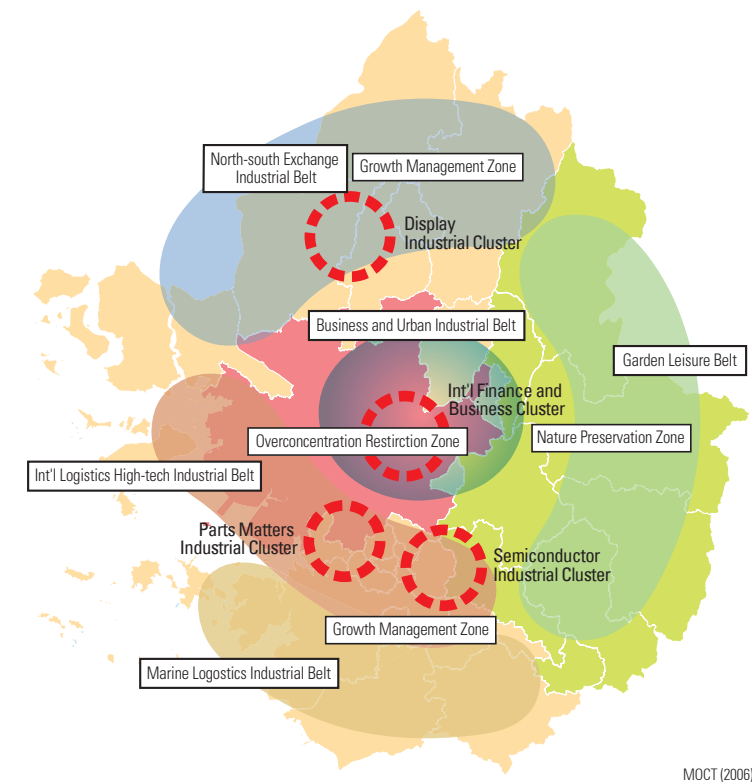
1st Seoul Metropolitan Area Readjustment Plan (1982~1996)



2nd Seoul Metropolitan Area Readjustment Plan (1997~2011)



3rd Seoul Metropolitan Area Readjustment Plan (2006~2020)



The First Seoul Metropolitan Readjustment Plan introduced strong regulation with the intention of controlling the excessive concentration of population and manufacturing industries in the Seoul metropolitan area and encouraging the selective functional distribution of both for a more balanced development of the region.

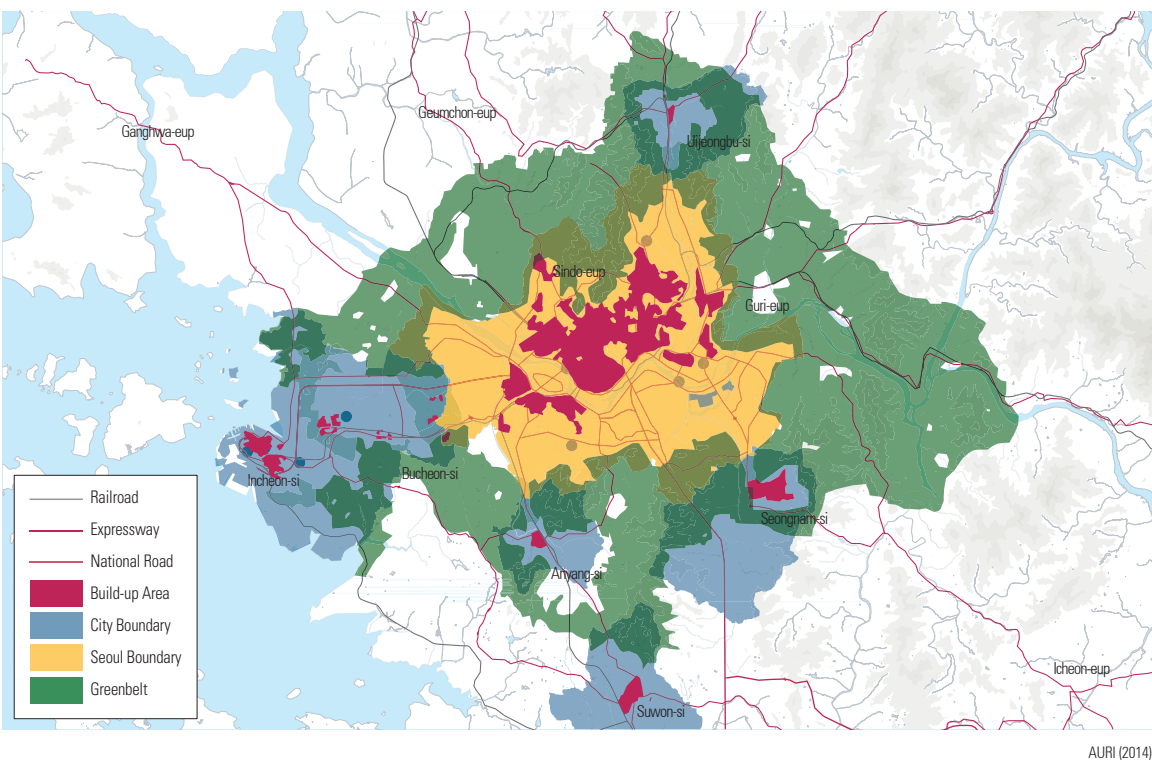
The Second Seoul Metropolitan Readjustment Plan had much more concrete aims such as the reorganizing of the Seoul metropolitan area, improving regional self-sufficiency, augmenting the capital's response to globalization, providing adequate infrastructure for potential reunification, implementing environmental conservation efforts,

and increasing the focus on quality of life issues.

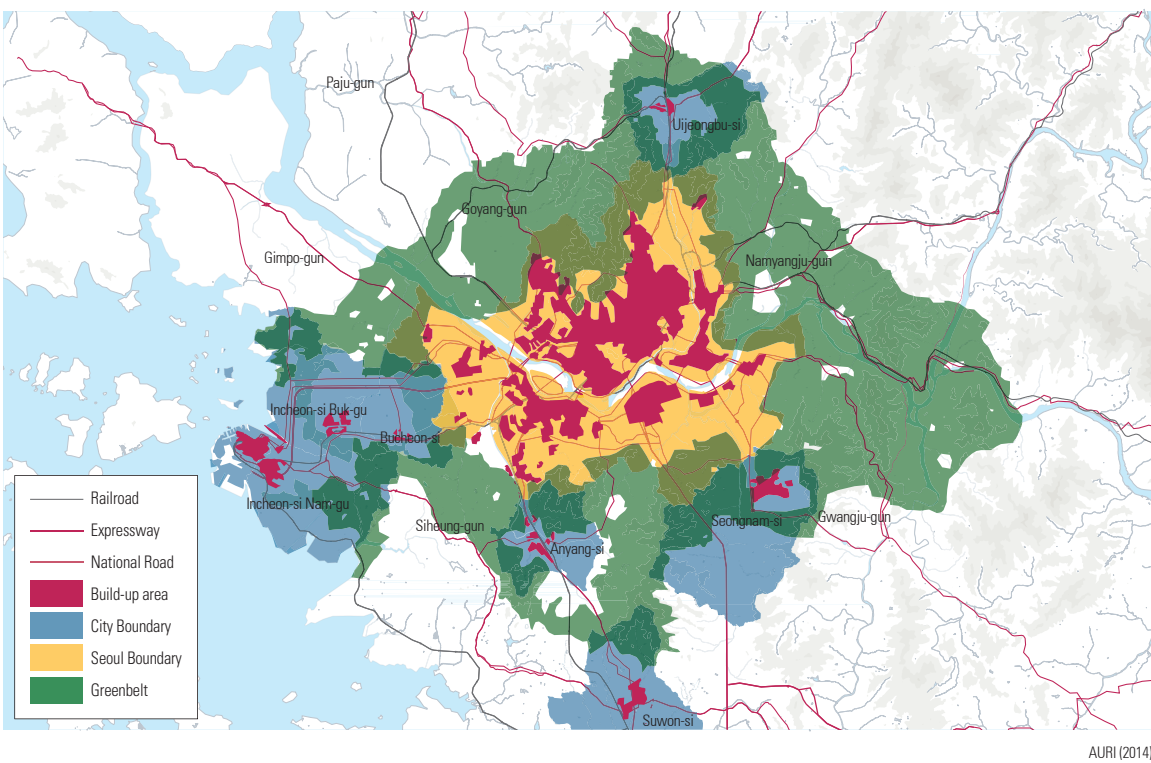
The Third Seoul Metropolitan Readjustment Plan set forth the goals of population stability, high global competitiveness, and the strategic development of the Seoul metropolitan area along with continuing to balance the development of the Seoul metropolitan area with that of other

regions. Third Plan focused on the transition from a Seoul-centered spatial structure to a multi-pronged approach to development nationwide, specifically with regard to the wider dissemination of specialized industrial specialty belts across different regions.

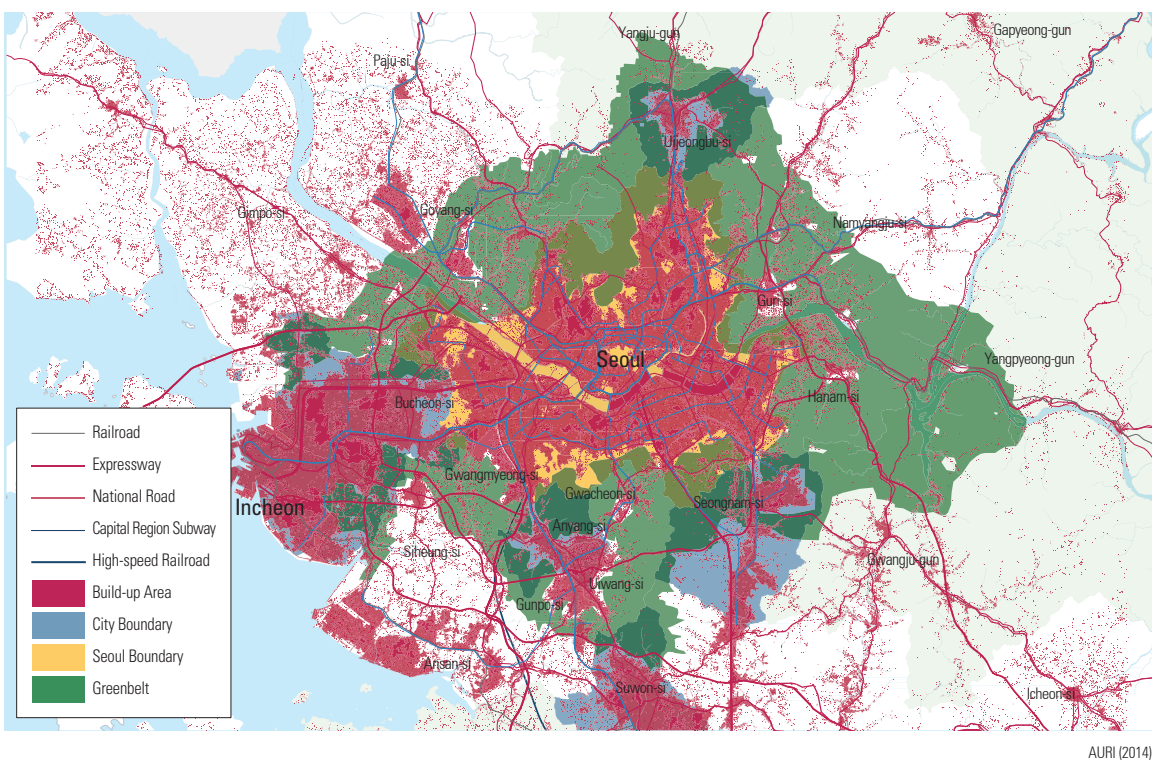
Seoul Metropolitan Spatial Structure (1970s)



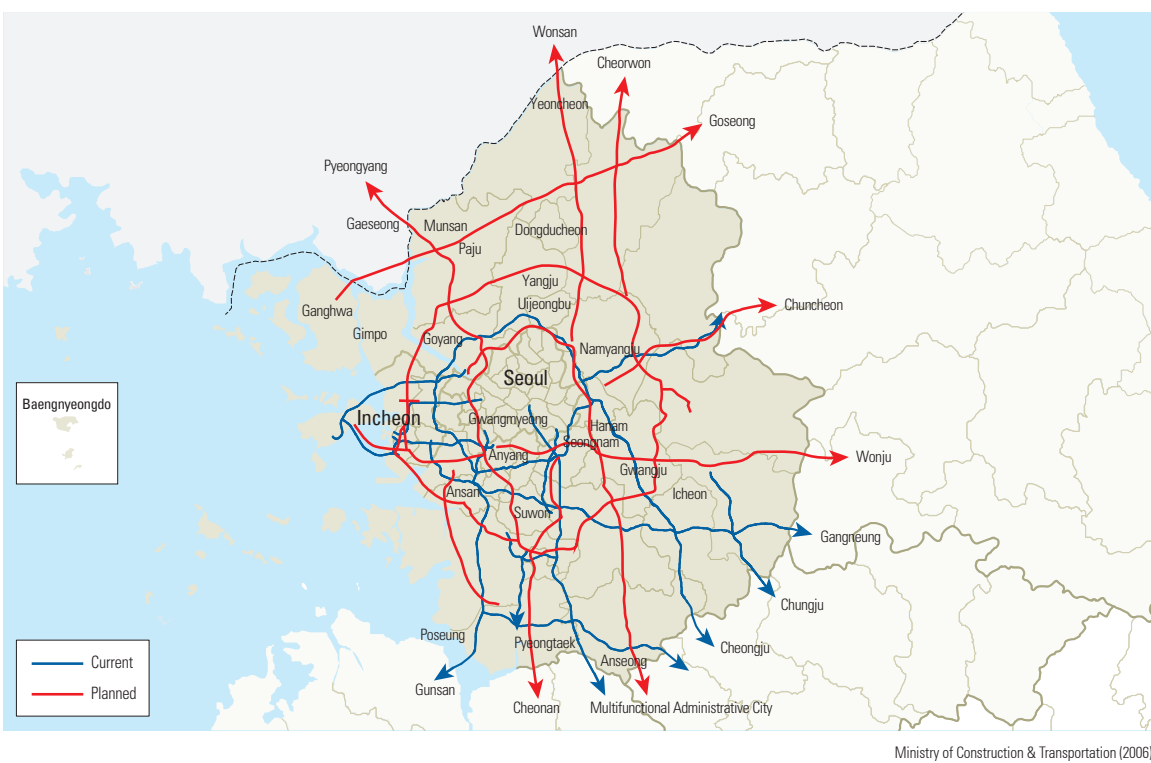
Seoul Metropolitan Spatial Structure (1980s)



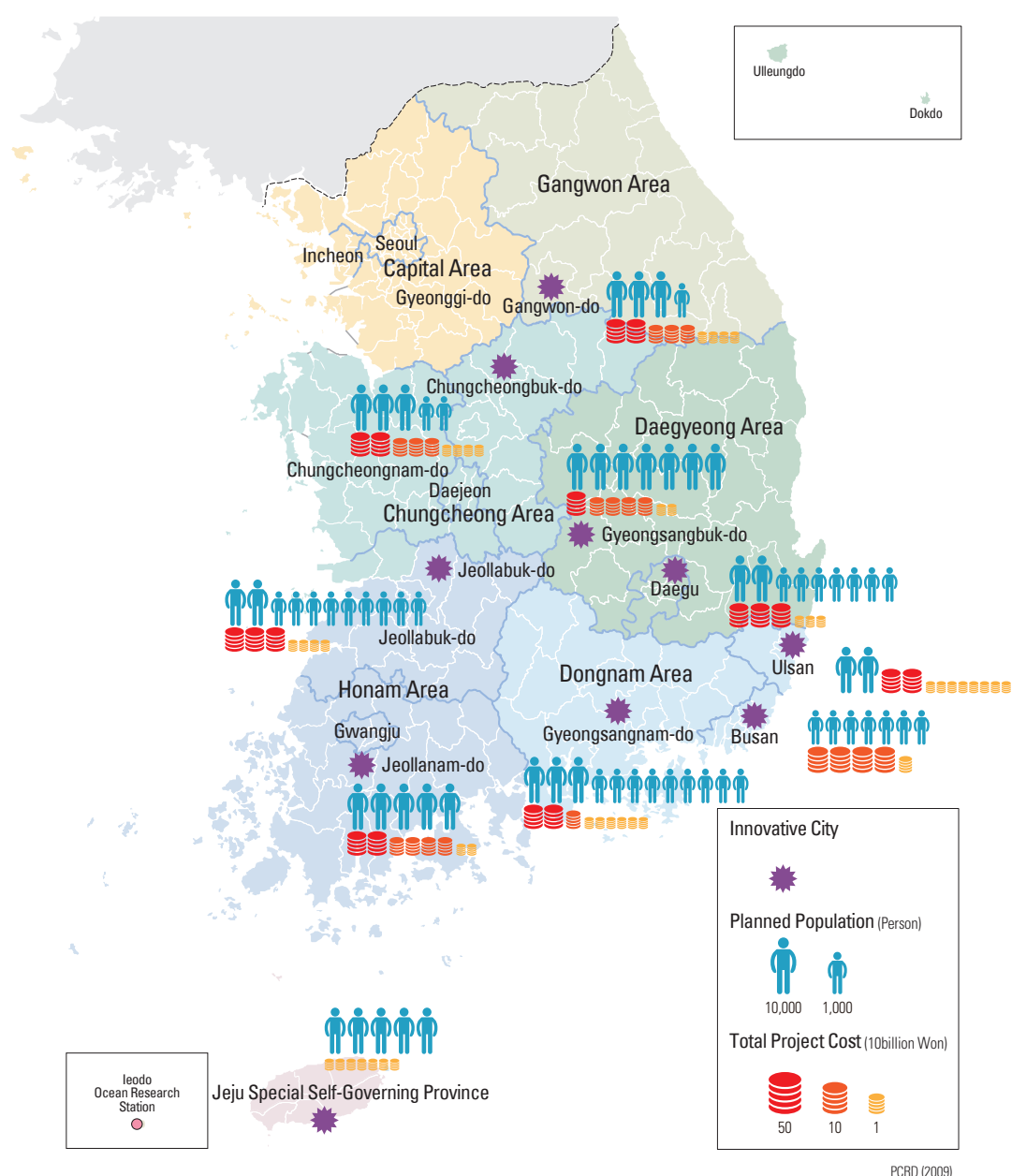
Seoul Metropolitan Spatial Structure (2000s)



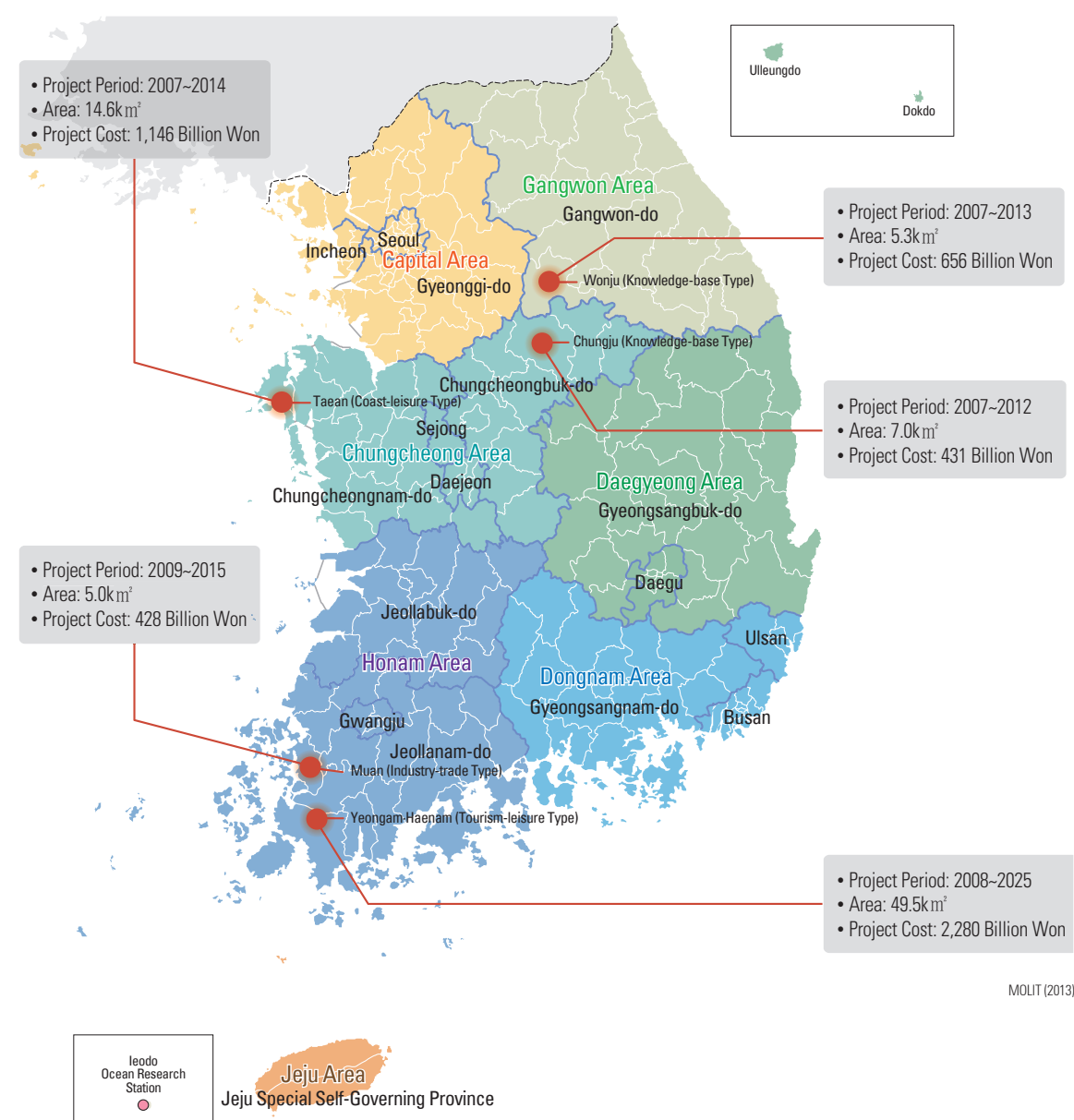
Current and Planned Principal Road Network in the Capital Region



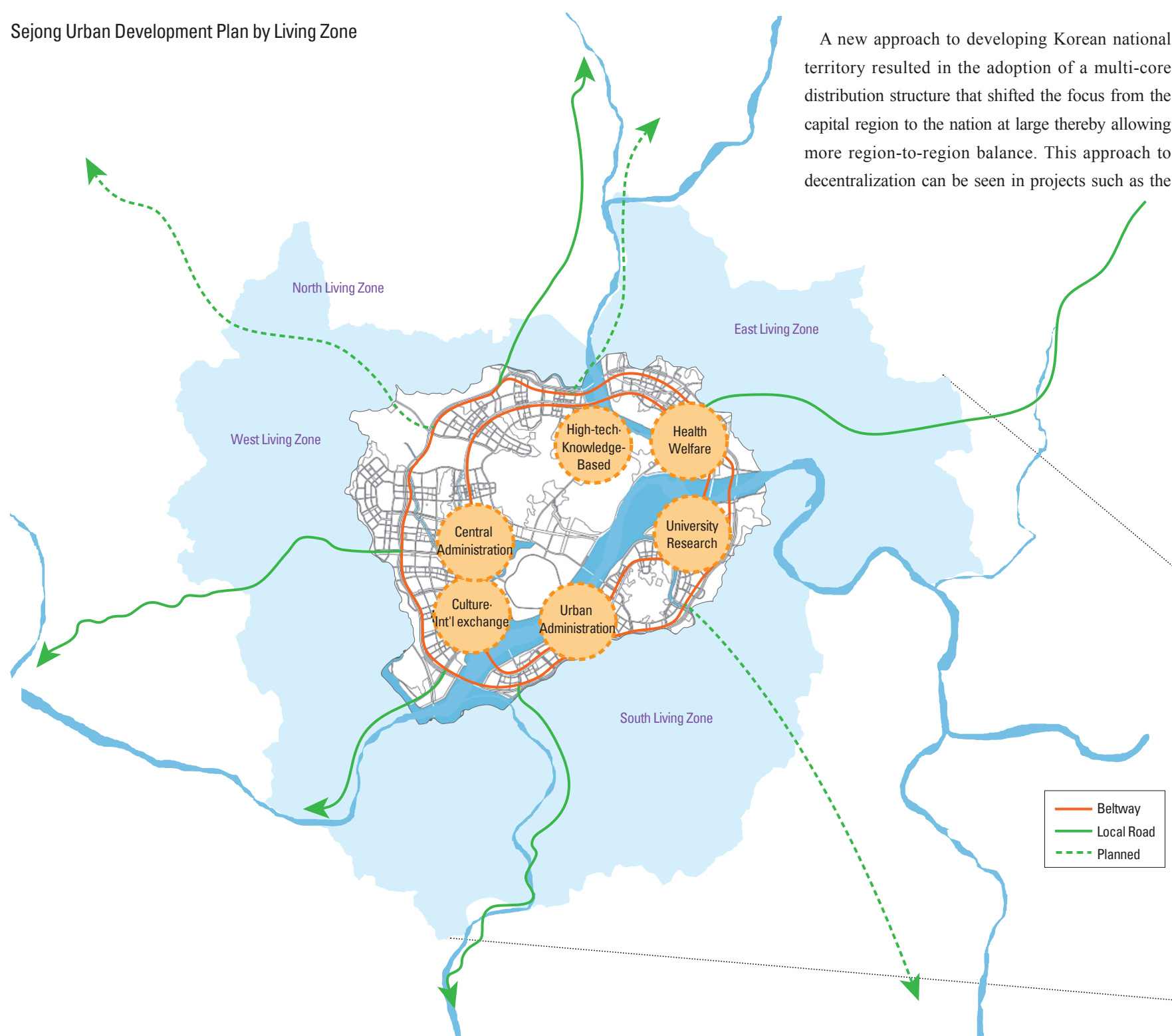
Current Status of Innovative City



Current Status of Enterprise City



Sejong Urban Development Plan by Living Zone



A new approach to developing Korean national territory resulted in the adoption of a multi-core distribution structure that shifted the focus from the capital region to the nation at large thereby allowing more region-to-region balance. This approach to decentralization can be seen in projects such as the

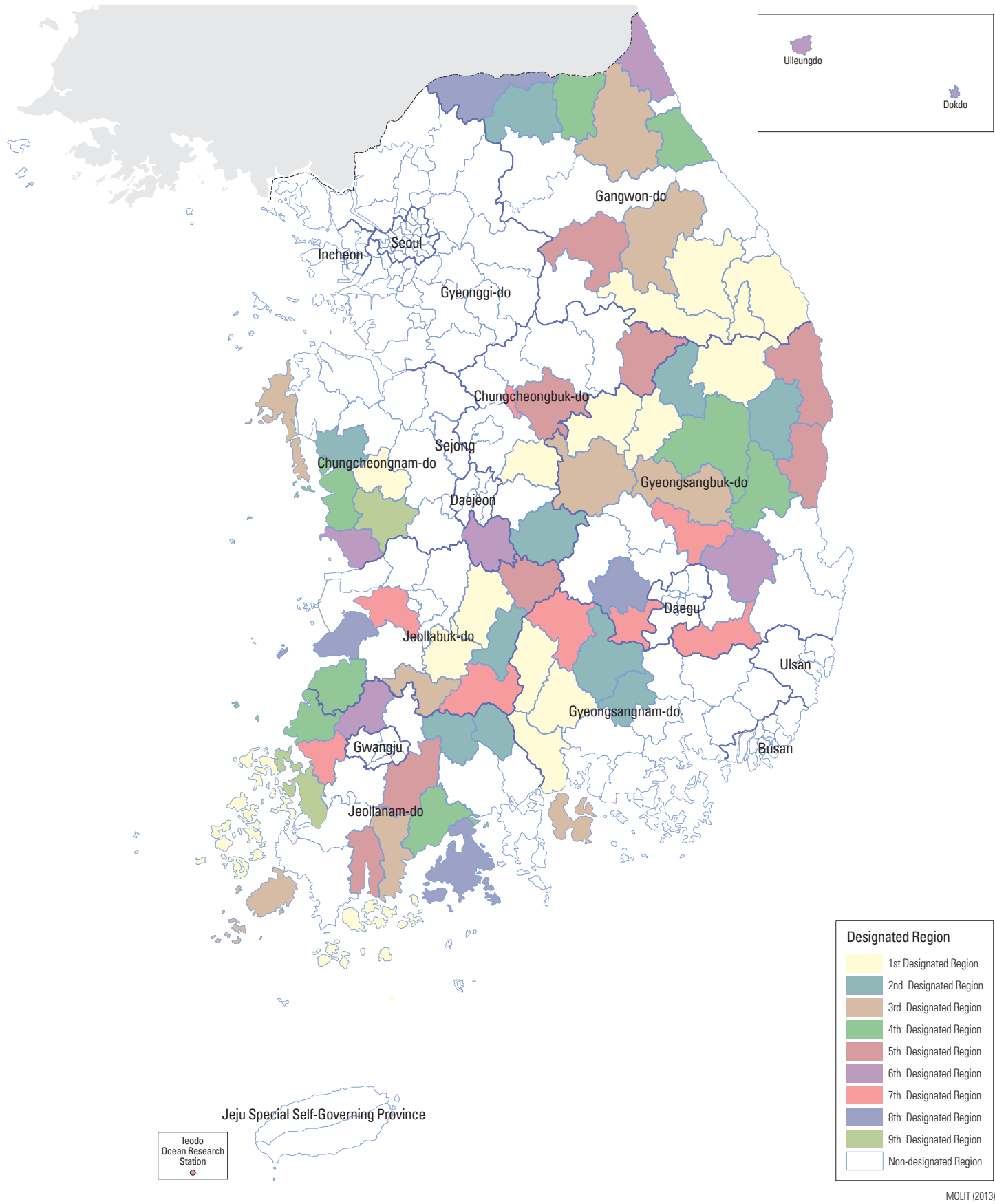
construction of multiple “Enterprise Cities” in the late 2000s that were part and parcel of the government’s attempts to foster five mega-regional economic zones and two individual economic zones in the hopes that such a broader distribution of development initiatives might help to create competitive agglomeration economies. The main strategy was to attract private investments and to expand the growth potential in each mega-regional economic zone.

The Park Geun-hye government established a new regional development policy that created what was called the “HOPE Area,” in which all basic daily services are integrated into a single living area. Here HOPE refers to the first characters of four policy visions such as Happiness, Opportunity, Partnership and Everywhere. The new policy was designed to establish autonomous development plans based on local conditions and aims at improving the quality of life for local residents no matter where they are located, in the rural areas, the rural-urban transition zones, or the core of the cities.

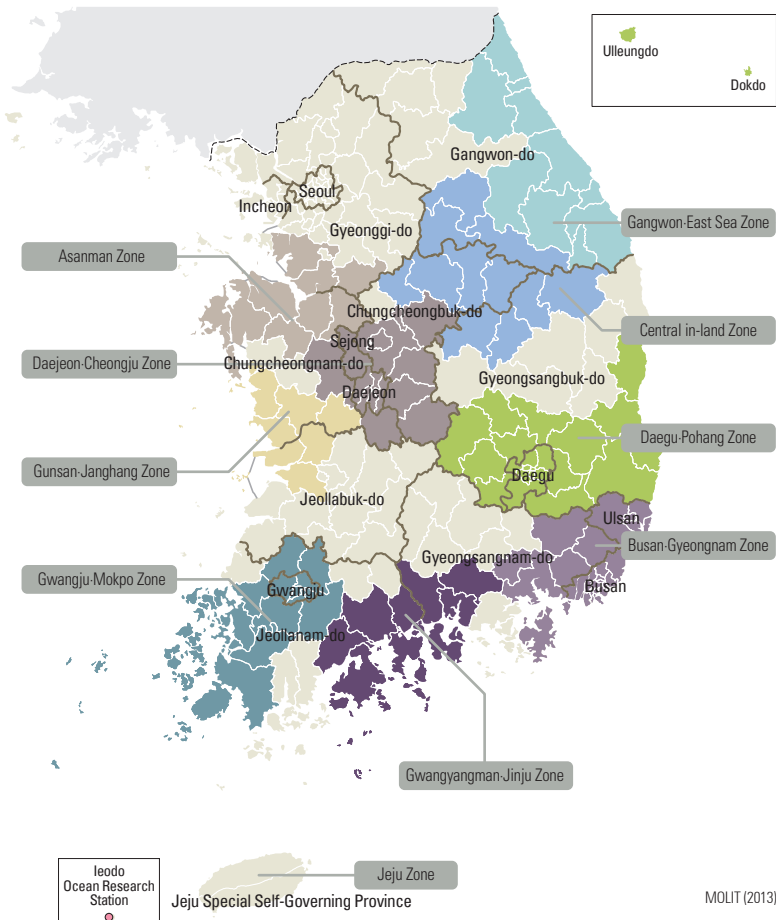


Regional Planning

Designation Status of Growth Promotion District



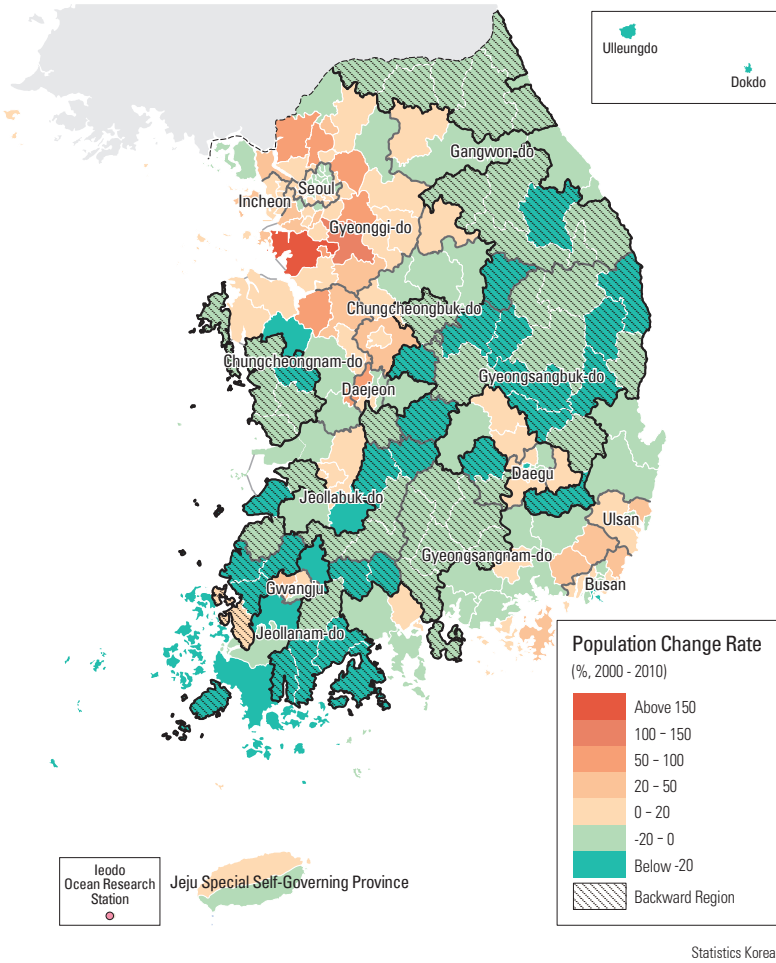
Designation Status of 10 Wide-area Development Zone



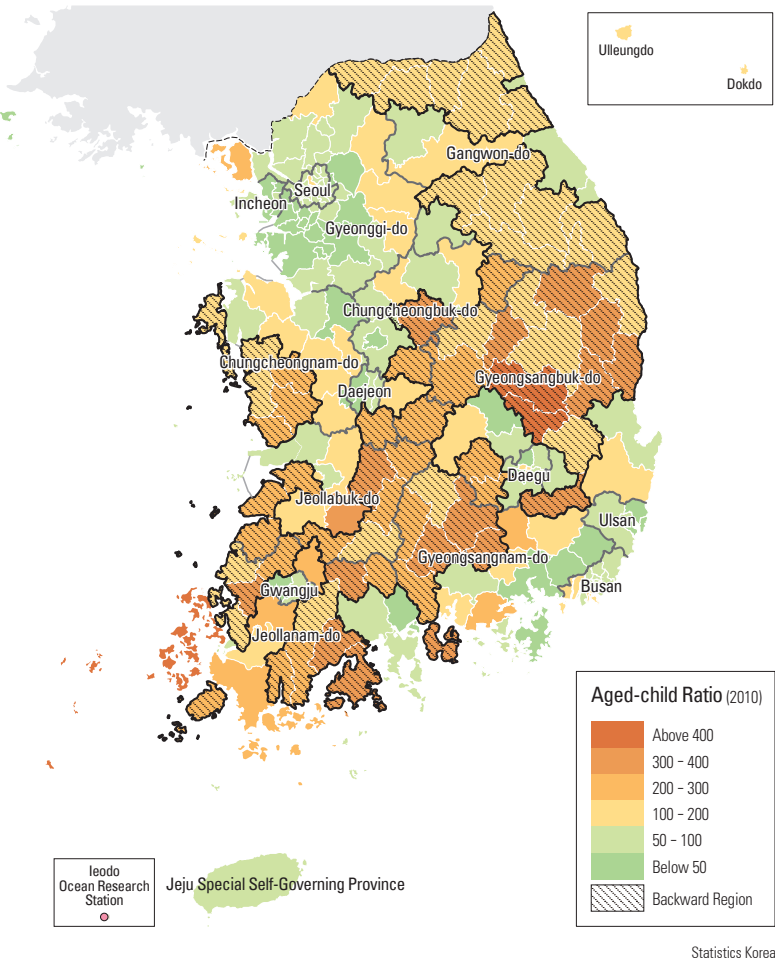
The most recent development plan also identified and designated districts for further development. The districts targeted for accelerated development were provided more support for infrastructure with the intention of strengthening their competitiveness by improving the potential for higher wages and a better overall quality of life. These newly identified districts were classified into three types based on an assessment of current key indicators. Depending on their classification, each district was then developed according to a model tailored to its current status: the backward area model, the balanced development model, and a city-rural-integration model. As of July, 2013, fifty-two districts and 70 cities were designated as befitting the backward area model. The balanced development model was assigned to the regions in which intensive development was needed to attract more private capital. Newer areas close to Bay Asan and cultural area of Baek-je have been designated according to the balanced development models. The city-rural-integration model was assigned when it was deemed necessary to link development of rural areas with neighboring city areas as a means of broadening the region's economic foundation. Gangneung-si was also designated in 1998, followed by Chuncheon-si in 2001, and Jecheon-si in 2004.

The Korean government systematically proceeded with the top 10 wide area development plans with the goal of establishing self-reliant local economies and promoting the larger cities outside the capital area as well as newly industrialized areas within the capital area.

Annual Average Population Change and Backward Region

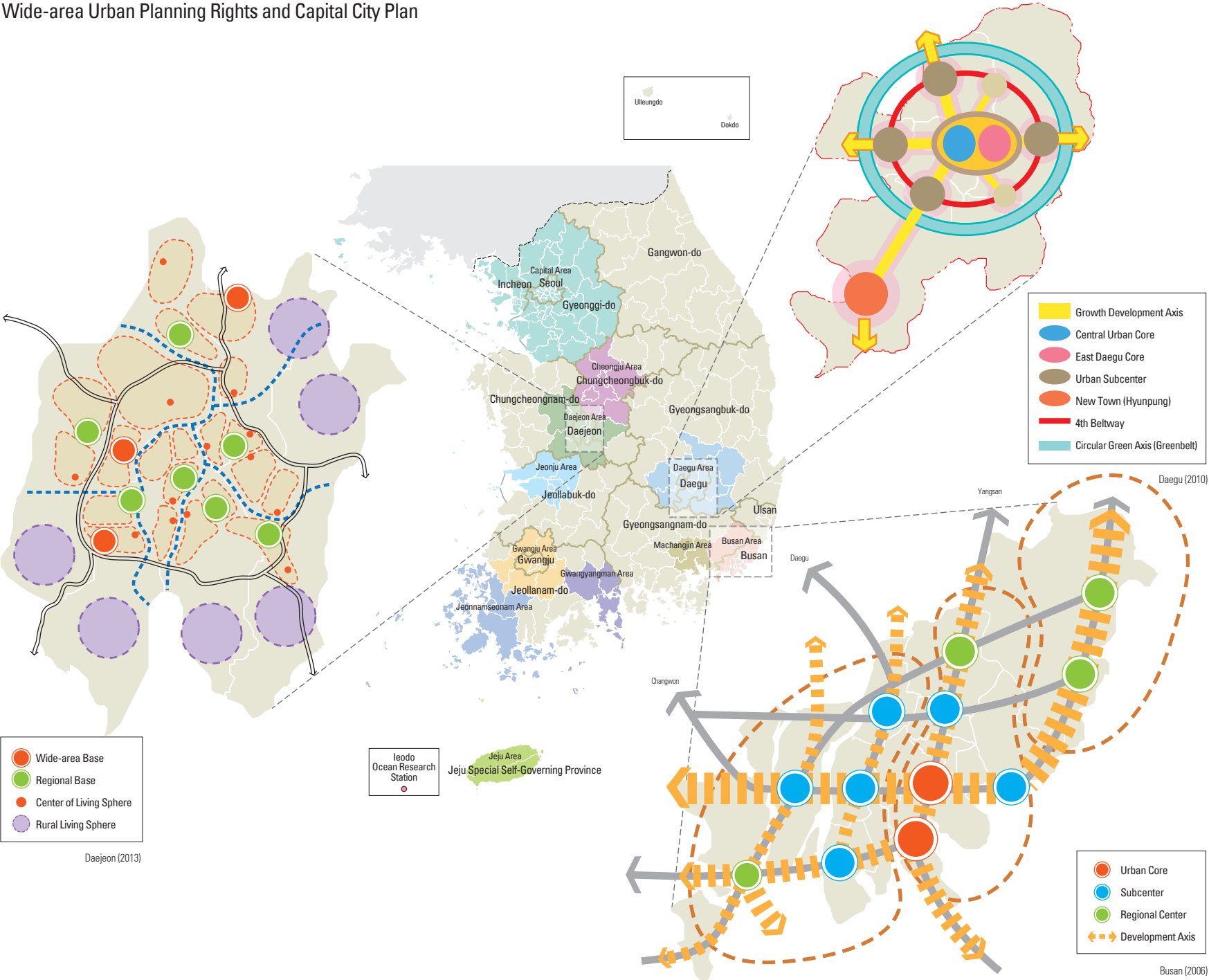


Aging Index and Backward Region



Urban Planning

Wide-area Urban Planning Rights and Capital City Plan



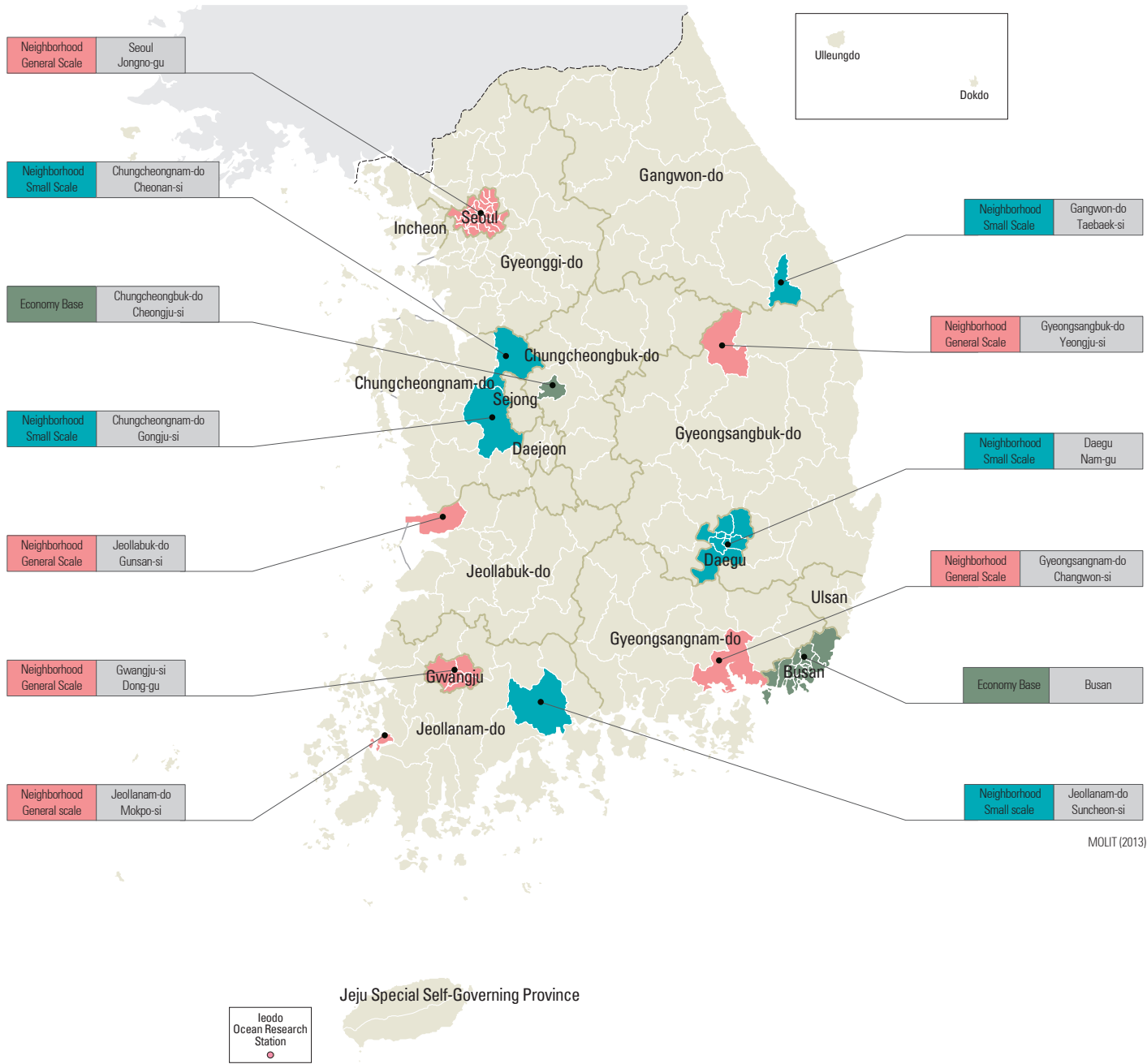
The area-wide regional plan presents the long-term 20-year development direction for area-wide regions comprised of two or more local governments. In 2013, 11 area-wide regional plans were established.

The city/county master plan is a comprehensive plan that presents the basic spatial structure and the long-term 20-year development direction for each city and county. The city/county master plan specifically focuses on land use, transportation, the environment, the landscape, safety, industry, information and communications, health, welfare, security, and culture.

The city/county management plan is a tool for rational management of the city/county's jurisdictions. It is designed to be consistent with the area-wide regional plan and the city/county master plan. It covers urban development, location of land use, designation of zones and districts as well as other urban issues.

The district unit plan is established for the purpose of rationalizing land use, improving both functionality and appearance, and ensuring environmental protection in the target regions of the city/county plan.

Urban Revitalization Leading Regions



In order to cope with the physical, social, and economic deterioration of the inner-city, the central government announced the national urban regeneration policy guidelines in 2013. The target areas were selected by three specific indices: decrease in population, decline of industry, and deterioration of housing and overall community condition. Based on these criteria the government has currently designated 13 regions that are a high priority for development according to urban regeneration policies. Those priority regions have been categorized into one of two types: economic revitalization or community restoration. The projects are currently financed by the urban regeneration fund with the expectation that individual pilot projects will result in positive ripple effects throughout the region.

New Town Distribution



Ilseong



Bundang



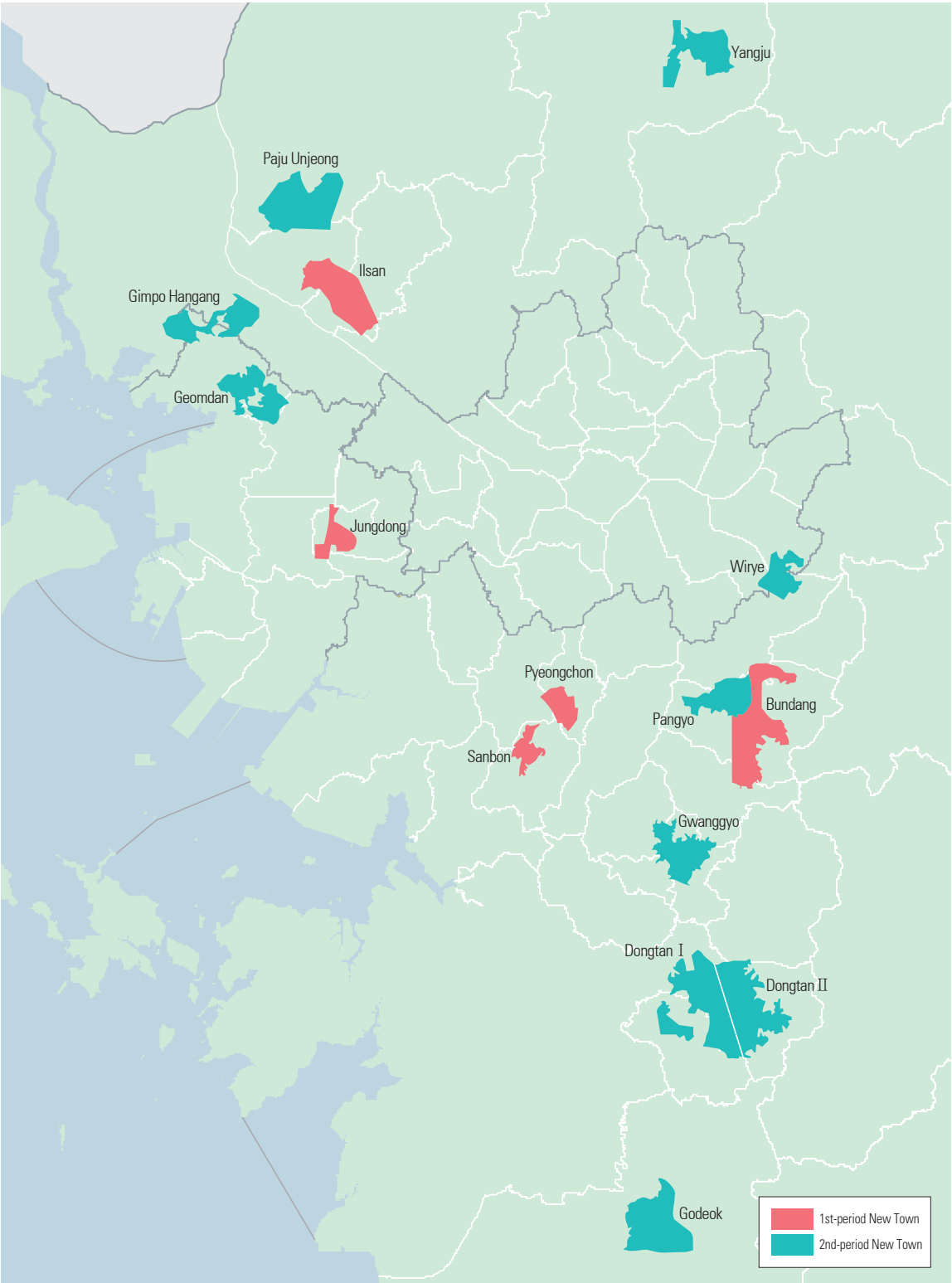
Jungdong



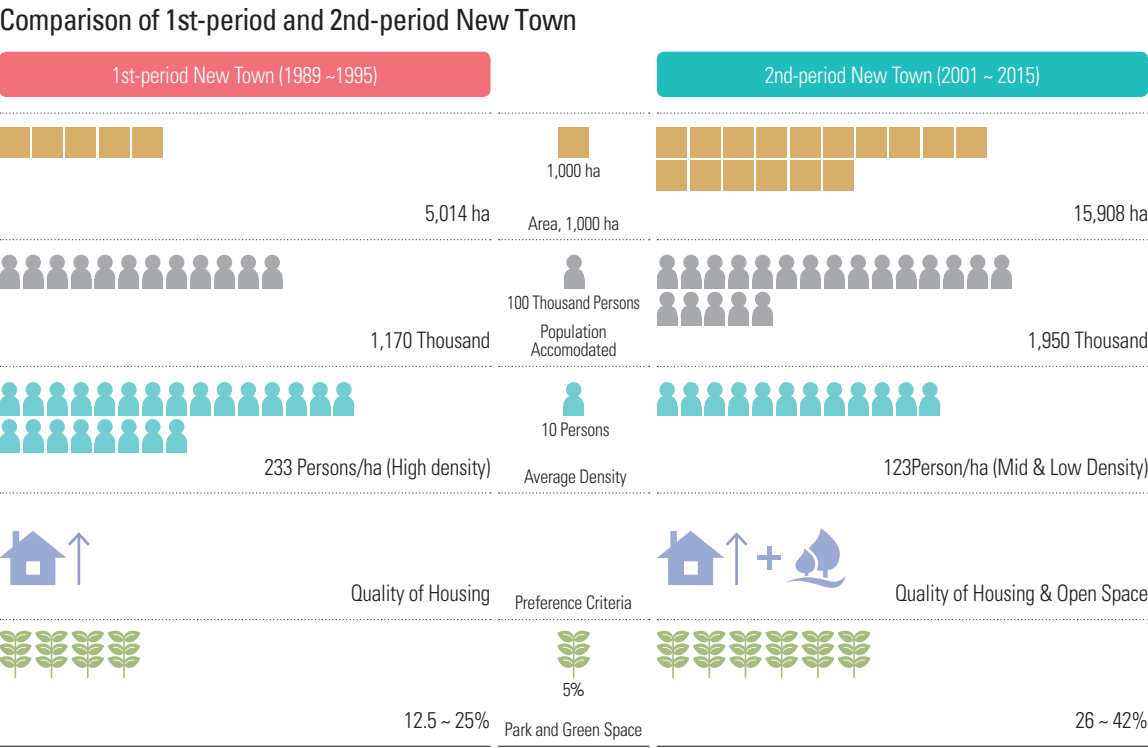
Pyeongchon



Sanbon



Ministry of Land, Infrastructure and Transport (2014)



Pangyo



Gimpo Hangang



Dongtan 1



Paju Unjeong



Wiryong

The construction of new, entirely modern towns in Korea began in earnest after the 1960s. This new town policy was centered upon two goals: first, the development of the national territory and its regions, second, the resolution of urban problems.

During the 1970s, the industrial cities were constructed in maritime regions with the primary goal of promoting heavy chemical industries. The construction of Changwon-si as a newly industrialized city with population of 300,000 led to the use of the term “New Town.” In the 1980s

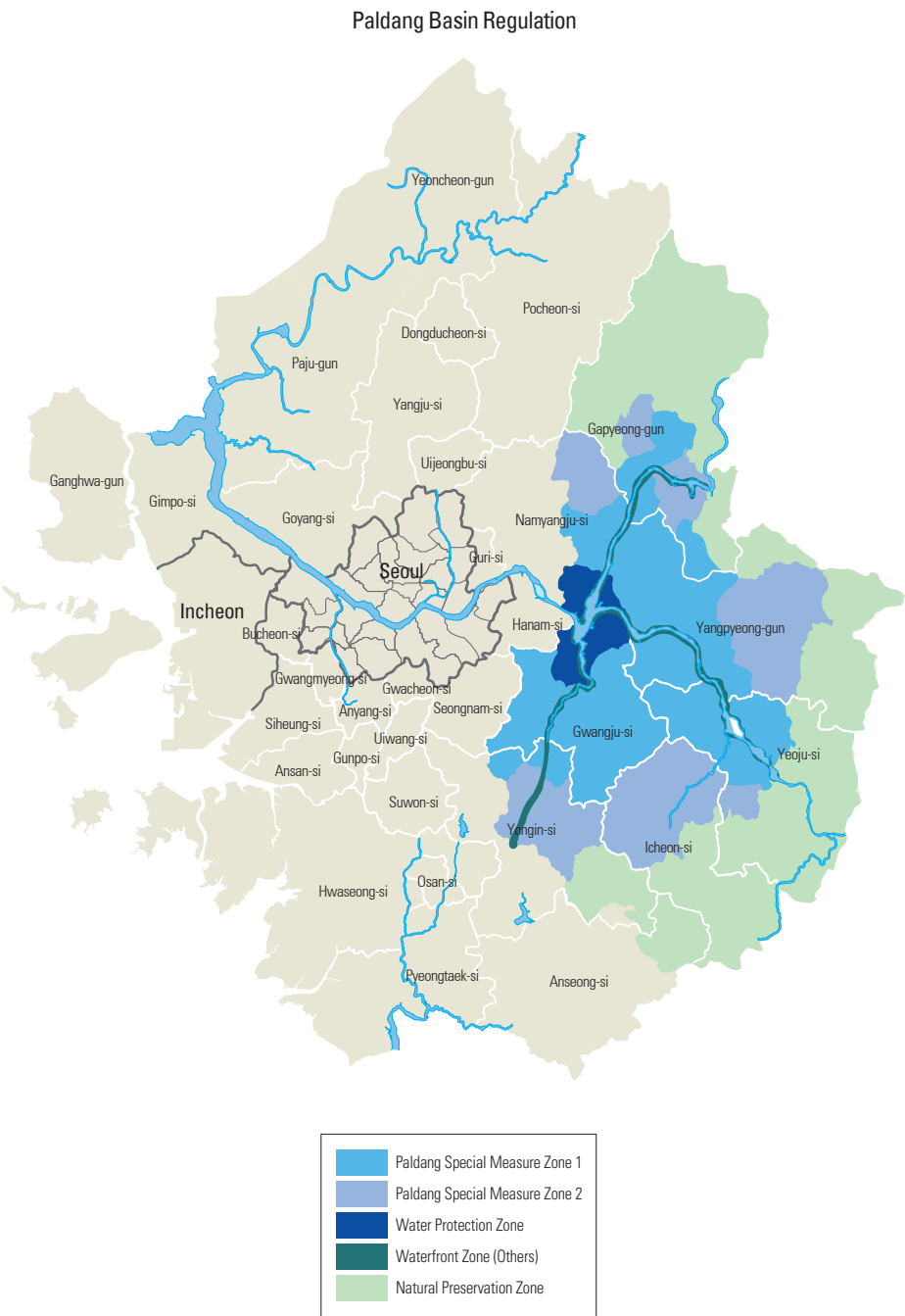
new towns in large cities were constructed in both Mok-dong and Sanggye-dong with primary goal of providing adequate housing. Five new towns in the capital area associated with this First Stage New Town Development were also constructed as a part of a plan to facilitate population dispersion by building two million homes. Daejeon-Dunsan and the Gyeryong area were constructed to facilitate the partial relocation of administrative functions out of Seoul and into the greater metropolitan area. Bundang, Ilseong, Pyeongchon, and Sanbon were all

also First Stage New Towns.

By the 1990s, there were many criticisms of these simultaneously developed large-sized new towns, and the policy trend shifted toward the development of small-sized communities that were dispersed through the outer lying areas of major metropolitan communities. Unfortunately, this attempt to redress the problems of First Stage New Towns was hindered by many serious obstacles, not the least of which included the lack of suitable infrastructure. By the turn of the last century,

Second Stage New Towns were constructed according to the concept of planned cities. The goal of these was to redress the problems created by the past approach to development and to supplant the smaller-sized dispersed development model with a more idealized model. Pangyo, Dongtan, Gimpo Hangang, Paju Unjeong, Yangju, Wiryong, Godeok, Geomdan, Asan, and Daejeon-Doan are all examples of planned cities.

Land Regulation in Gyeonggi-do



Gyeonggi-do (2014)

The Regional Regulation portion of the Seoul Metropolitan Readjustment Plan divided Seoul into three regions: an overpopulation control area,

an urban growth management area, and a nature conservation area. Among the regulations included in the Readjustment Plan are the prohibition of new

large company complexes, the prohibition of new large universities, restriction on large development projects, and stricter regulation of existing

industrial sites.

Regional Development

The goal of regional development is to foster activities and outcomes that promote economic growth and to build foundations that will improve the quality of life for residents in the region. The stakeholders of each region are the businesses and residents themselves who would ideally participate in key regional development activities.

The scope of regional development varies, but generally it is enacted at the sub-national level, by way of local self-governing bodies. Recently, however, as new approaches emphasize the quality of life and the socioeconomic reality beyond the existing administrative boundaries, more function-oriented regionally based development approaches are being brought into play.

In general, the role of both the central and local

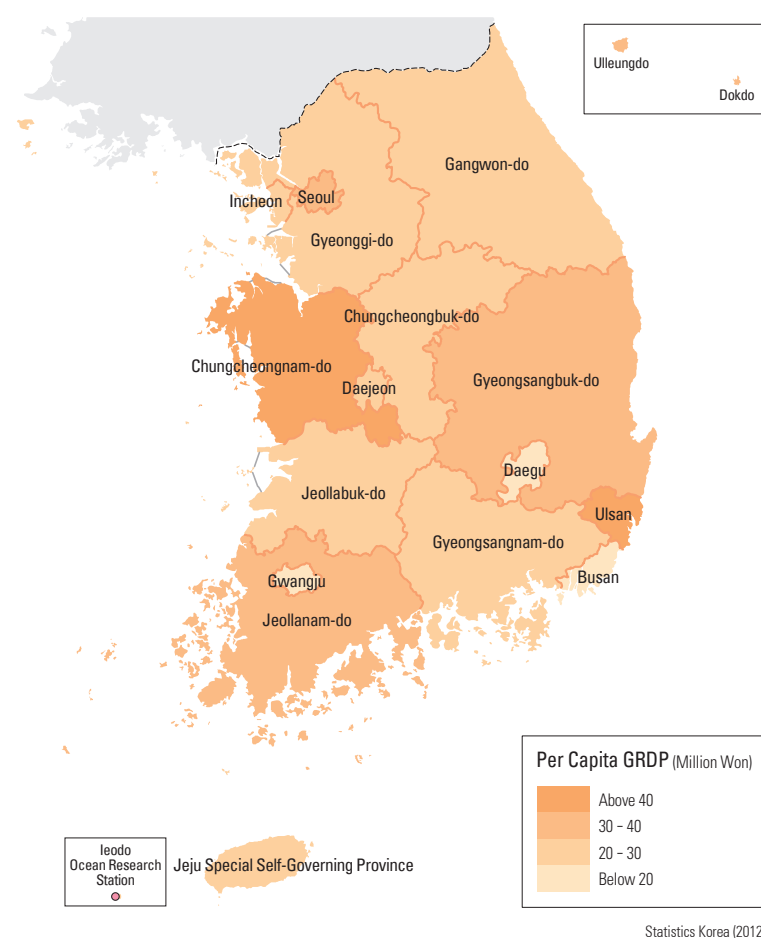
governments in regional development is very significant. Under a market economy, both structural dynamics and uneven distribution of benefits including natural endowments inevitably cause spatial disparity in regional development; therefore, a government policy intervention to fix this spatial disparity is often deemed necessary. Accordingly, the central government's policy efforts on regional development have been carried out for a long time at various levels of government. Like other countries in the Organization for Economic Cooperation and Development (OECD), the regional development policy in Korea has focused on lessening regional disparity through improving backward areas. The rapid modernization process since the 1960s brought about

remarkable economic growth and material abundance, but it has also caused many serious problems not the least of which includes the ever-increasing disparity of both economic power and quality of life between different regions. In order to solve such problems, the Korean government has promoted various developmental policy options for backward areas and has shifted its policy focus from infrastructure investments such as enterprise relocation and expansion of the economic growth base to making the quality of residents' lives a higher priority.

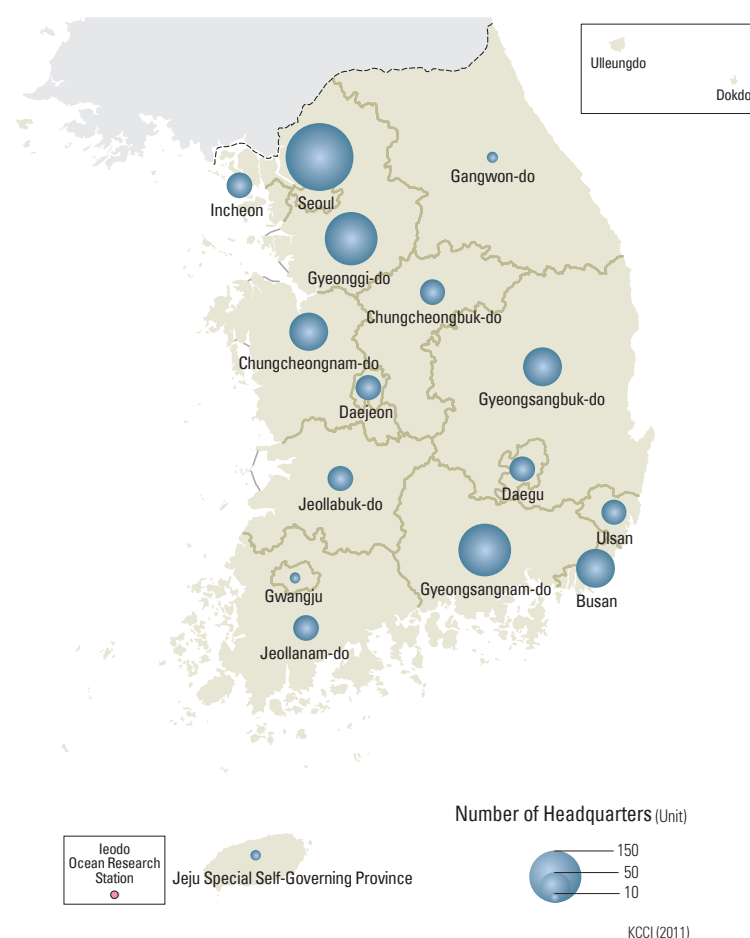
In spite of the many policies and financial investments that have targeted regional disparity thus far, the problem of spatial dualism in Korea between the capital region

and provincial regions and between urban and rural areas still remains quite serious. In addition, as changes in regional development occur, issues such as economic globalization, deepening inter-regional competition, and the demand for greater local autonomy further complicate the development process. The pursuit and promotion of more effective regional development policies are now more necessary than ever. In this current context, there has been a policy paradigm shift toward solving the real problems of both regions and their residents by creating decent jobs within the region, by promoting living conditions that foster the enjoyment of social and cultural benefits, and by ensuring that the basic welfare of the people is protected and nourished.

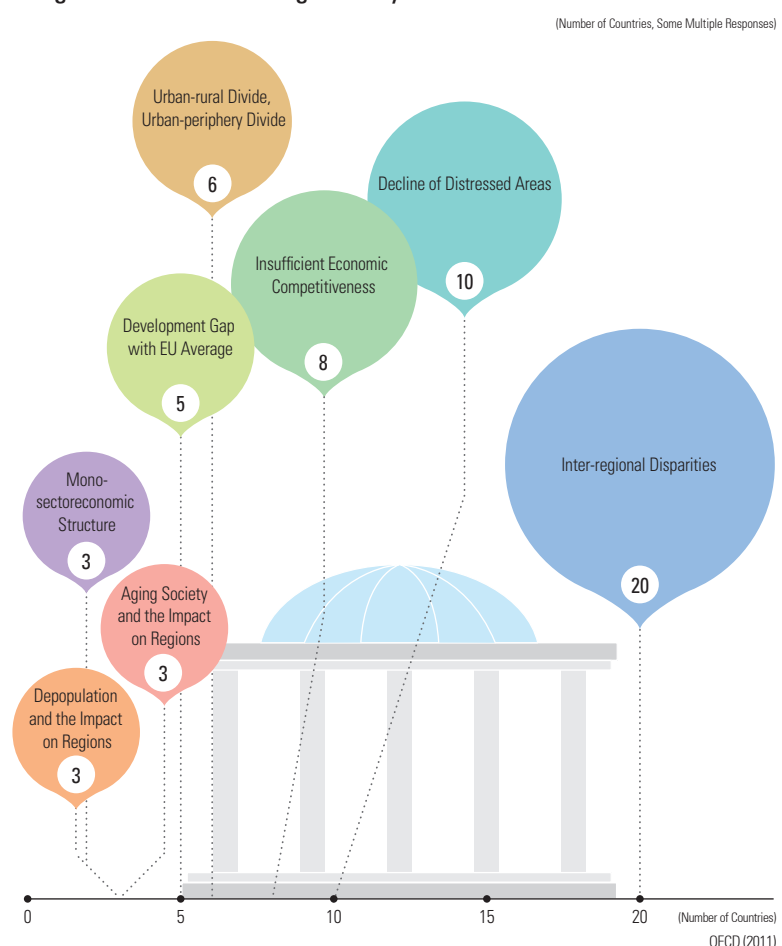
Per Capita GRDP



Headquarters of Major Corporations

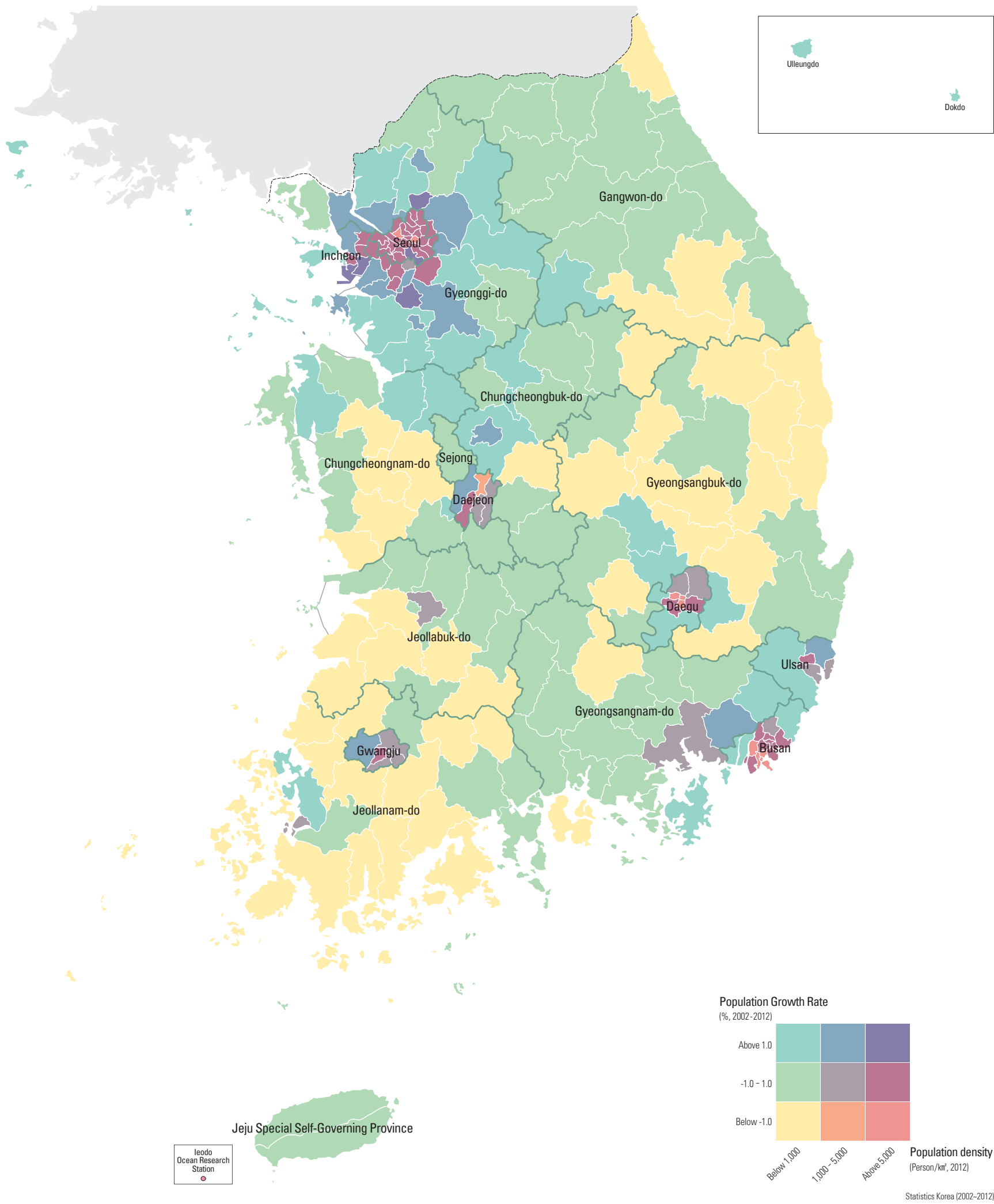


Regional Problems Recognition by OECD Central Governments



Regional Development and Policy Framework

Regional Development Pattern in Korea: Population Aspect



In the Special Act on Balanced National Development (SABND) that provides an institutional basis for regional development policy in Korea, regional development is defined as “activating regional economies by facilitating region-specific development and inter-regional cooperation based on autonomy and creativity, and strengthening regional competitiveness by improving the quality of life of citizens.”

In addition, the SABND supports regionally specific development according to a region’s key features and its comparative advantages. Special accounts were set aside for regional development in order to effectively pursue both the promotion of a high quality of life as well as the intensification of regional competitiveness. These special accounts were separated into the Living Infrastructure Account, the Economic Development Account, and the Jeju Special Self-Governing Province Account and Sejong Special Autonomous City Account in 2014. These accounts began to provide more differentiated regional support in accordance with regional and industrial features.

SABND’s new focus on quality of life issues shifts the orientation of contemporary Korean development policy toward the matter of larger human concerns. Specifically, there is now a concerted effort to alleviate the problems created by urbanization and regional economic disparity not only by providing decent jobs and social and cultural opportunities but also by fostering health, happiness, and optimism. This new approach attempts to construct cooperative partnerships between residents and their local and central governments.

This new trend in regional development signals a shift in focus from emphasizing economic competitiveness and all that entails to placing a higher premium on the quality of life for all Korean citizens. For the first time since the early post-war years, the happiness of the citizenry is now a top priority, one which is reflected in the language and the enactment of current development policy.

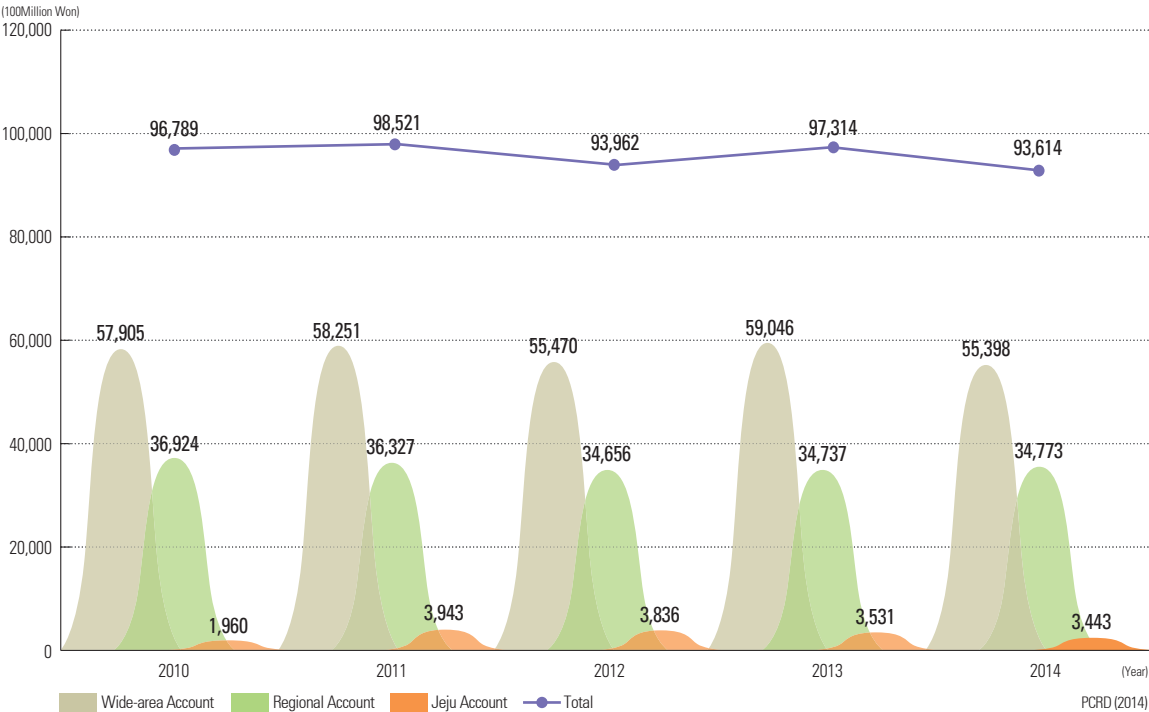
The spatial patterns of regional development in Korea continue to be very uneven. The structural regional disparities between the capital region and the provinces as well as between the urban and the rural regions resulted from the rapid modernization and industrialization in Korea in the post-war decades. There have been various policy-driven attempts to help overcome these disparities, but thus far such redressing has proven to be a long and complicated process. In the 2000s, there was a policy shift toward emphasizing both regional empowerment as well as the significance of quality of life issues, both of which were intended to lessen the regional disparity. The Special Account for Balanced National Development, introduced in 2005, was renamed the Regional Development Special Account due to changes in the policy framework for regional development in the Lee Myungbak administration. In 2013, the Park Geun-hye administration ushered in a shift in regional development policy that resulted in a new focus on primary-level capacity. The enactment of projects such as the “HOPE Area” represents a new era in regional development. The paradigm shift can be seen in gestures such as the renaming of the Special Account for Regional Development: The Jeju Special Self-governing Province Account remains the same, but the Sejong Special Autonomous City Account has been newly created.

Shifting Regional Policy Paradigm in OECD

| | Old paradigm | New paradigm |
|--------------------------|--|---|
| Problem recognition | Regional disparities in income, infrastructure stock, and employment | Lack of regional competitiveness, underused regional potential |
| Objectives | Equity through balanced regional development | Competitiveness and equity |
| General Policy Framework | Compensating temporally for location disadvantages of lagging regions, responding to shocks (e.g. industrial decline) (Reactive to problems) | Tapping underutilized regional potential through regional programming (Proactive for potential) |
| Instruments | Subsidies and state aid (often to individual firms) | Mixed investment for soft and hard capital (business environment, labor market, infrastructure) |
| Actors | Central government | Different levels of government, various stakeholders (public, private, NGOs) |

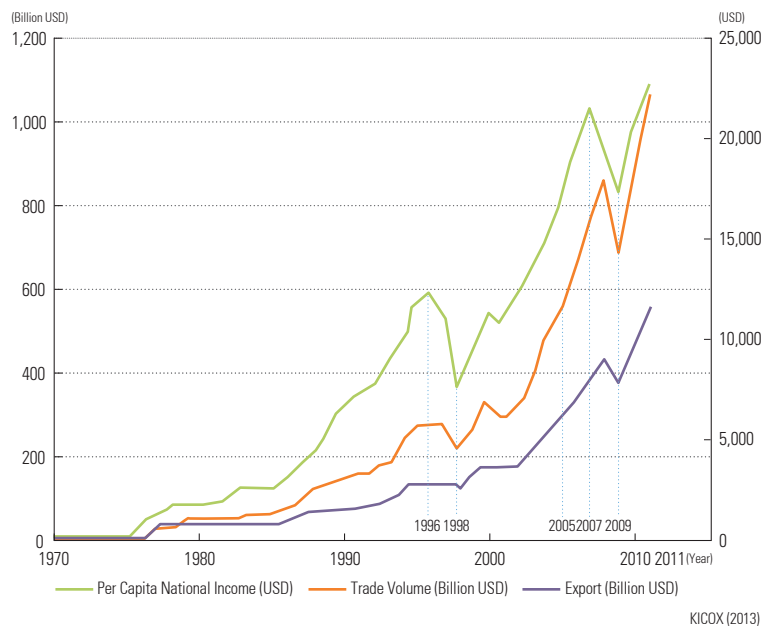
OECD (2010)

Special Account for Regional Development and Financing Situation

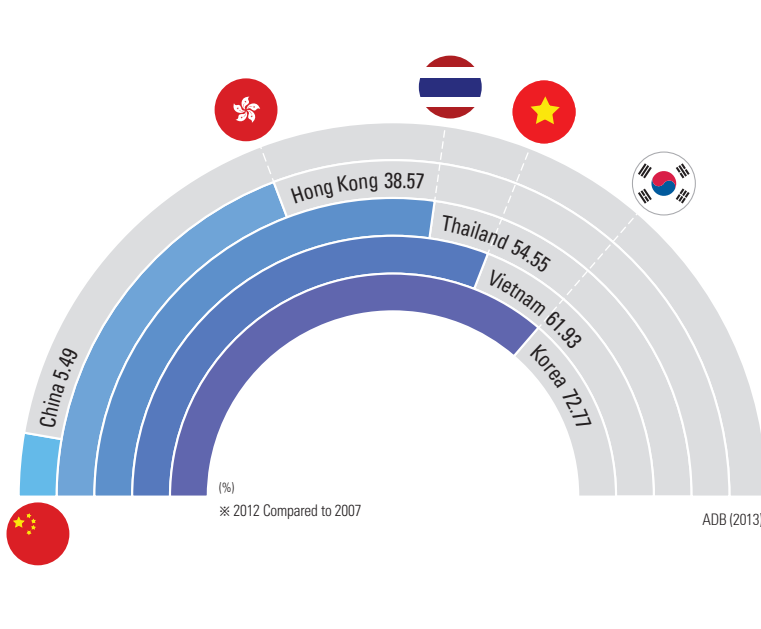


Background of Regional Development Policy

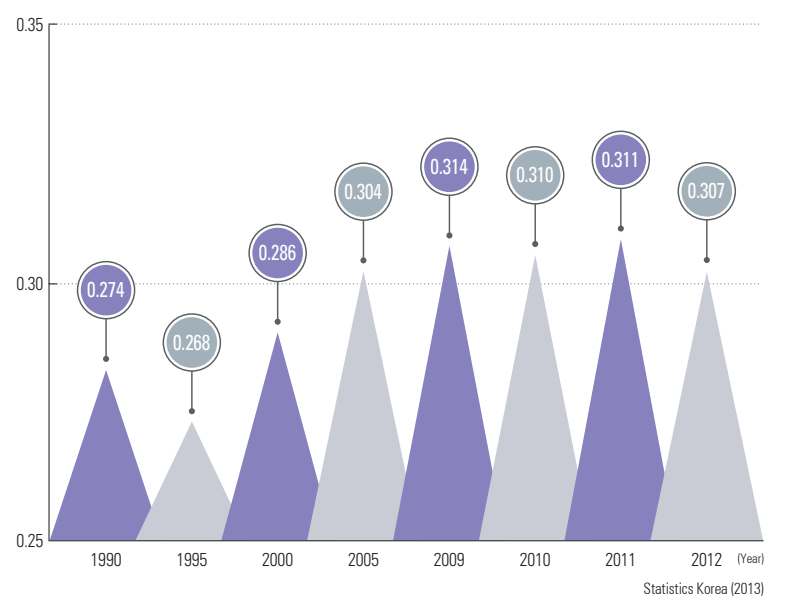
Economic Growth Dynamics



Foreign Tourist of Major Asian Countries



Changing Gini Index in Korea

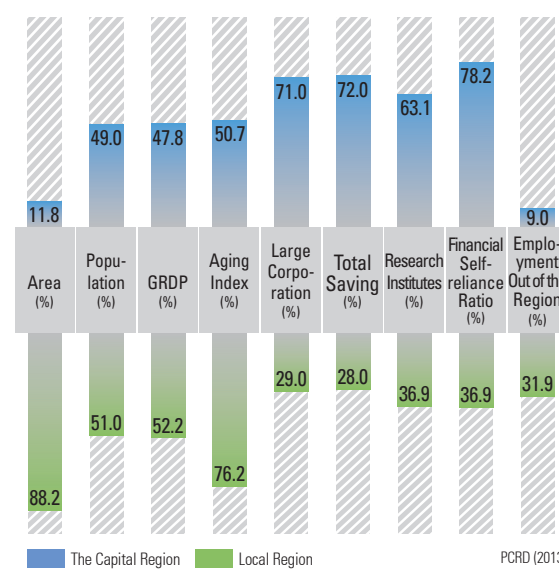


Korea's 50 years of experience in modernization is now clearly shedding some light on the process - both its positive and negative aspects. During this last half century, the national income has increased by 285 times and the country's export volume has increased by 16,600 times. Korea has moved from being an international aid recipient to becoming an international aid provider, which is the first such case in world history. However, social problems such as high divorce rates and high suicide rates continue to be a concern. The Korean divorce rate is 7th among OECD countries, and the suicide rate is 1st. The national happiness index is also ranked only 97th out of all 148 countries in the world. Income inequality has also expanded to a high degree.

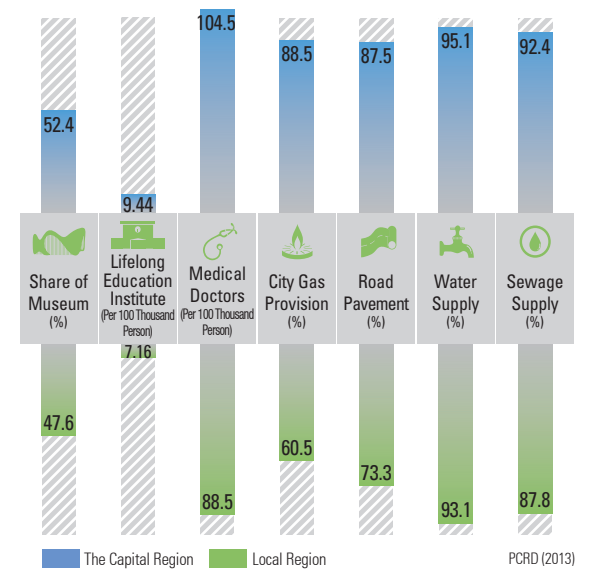
As conflicts and distrust across generations grow, income inequality and regional disparities deepen; the social conflict index is ranked 4th among OECD countries.

In the meantime, due to the increase in national income, the demand for social services like welfare and public education have increased as has the expectation of broader cultural activities. Because of the institutionalization of local autonomy for more than 20 years now, new regional policies have shifted to a bottom-up and decentralized approach that provides services that emphasize happiness and quality of life for local residents. These autonomous, local policy changes allow both residents and local government bodies to play active roles collaboratively.

The Capital and Local Region Disparity of Economic Capability

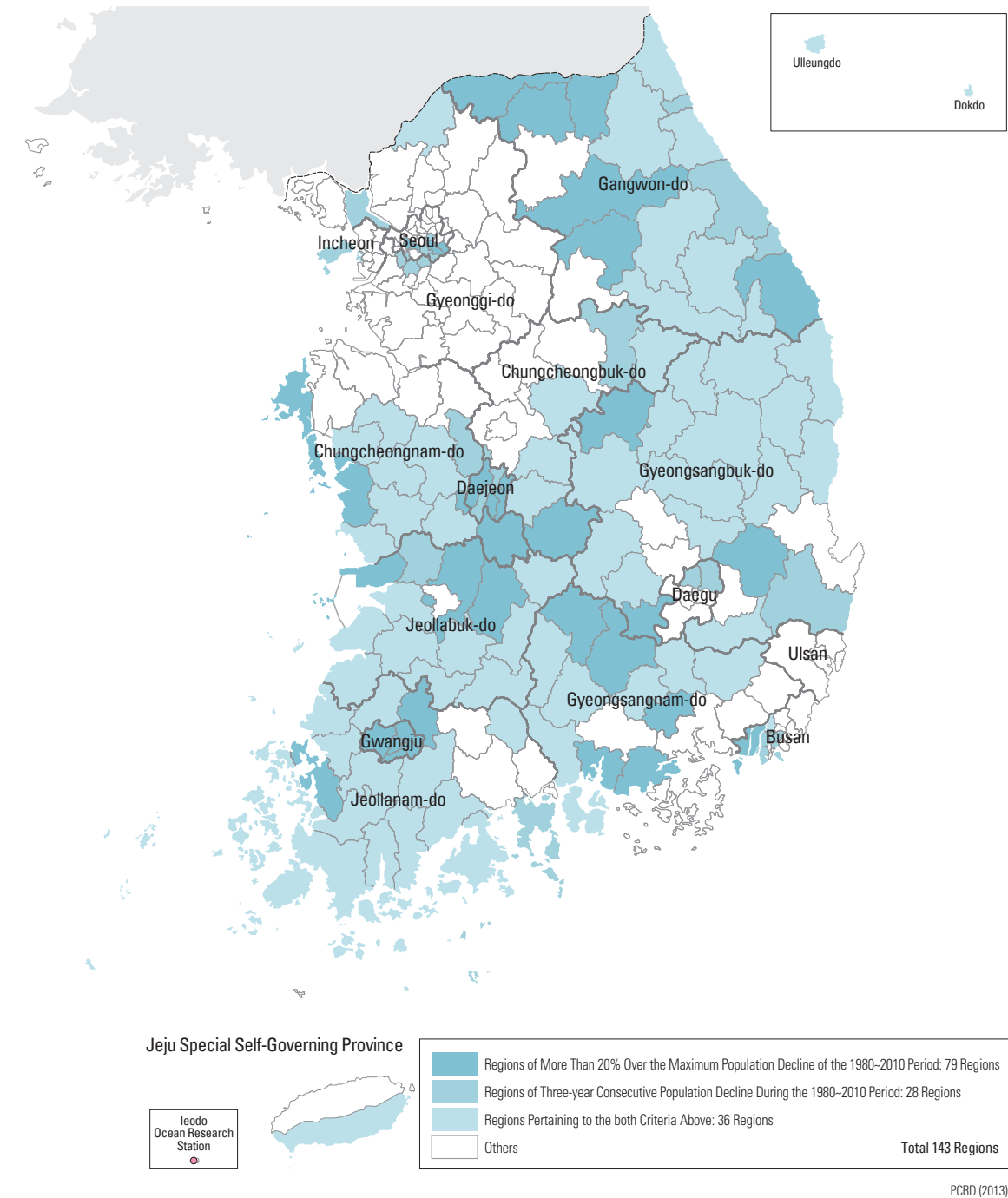


The Capital and Local Region Disparity of the Quality of Life



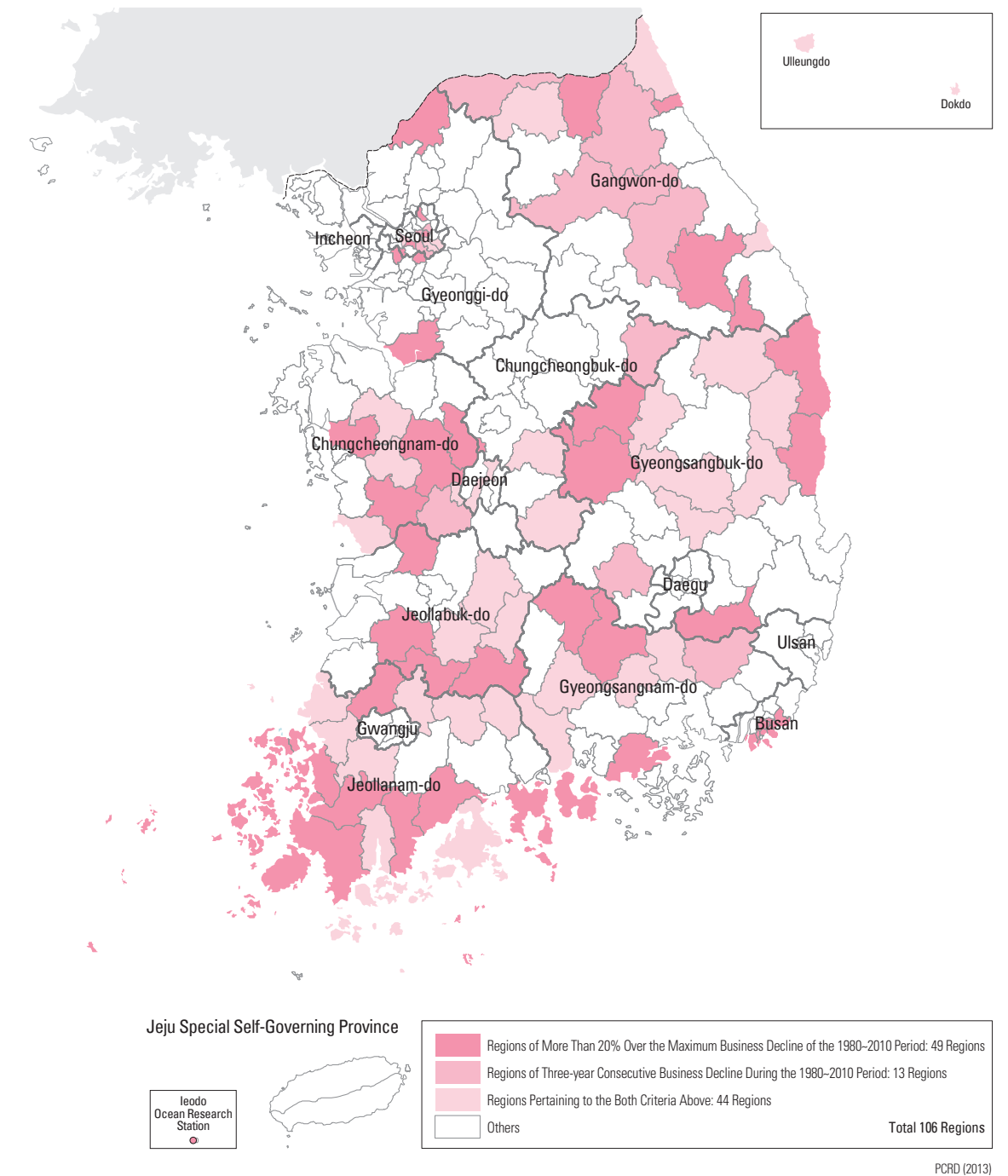
Depopulating Regions

143 Regions (62%)



Regions with Declining Business

106 Regions (46%)



Changing Regional Development Policies

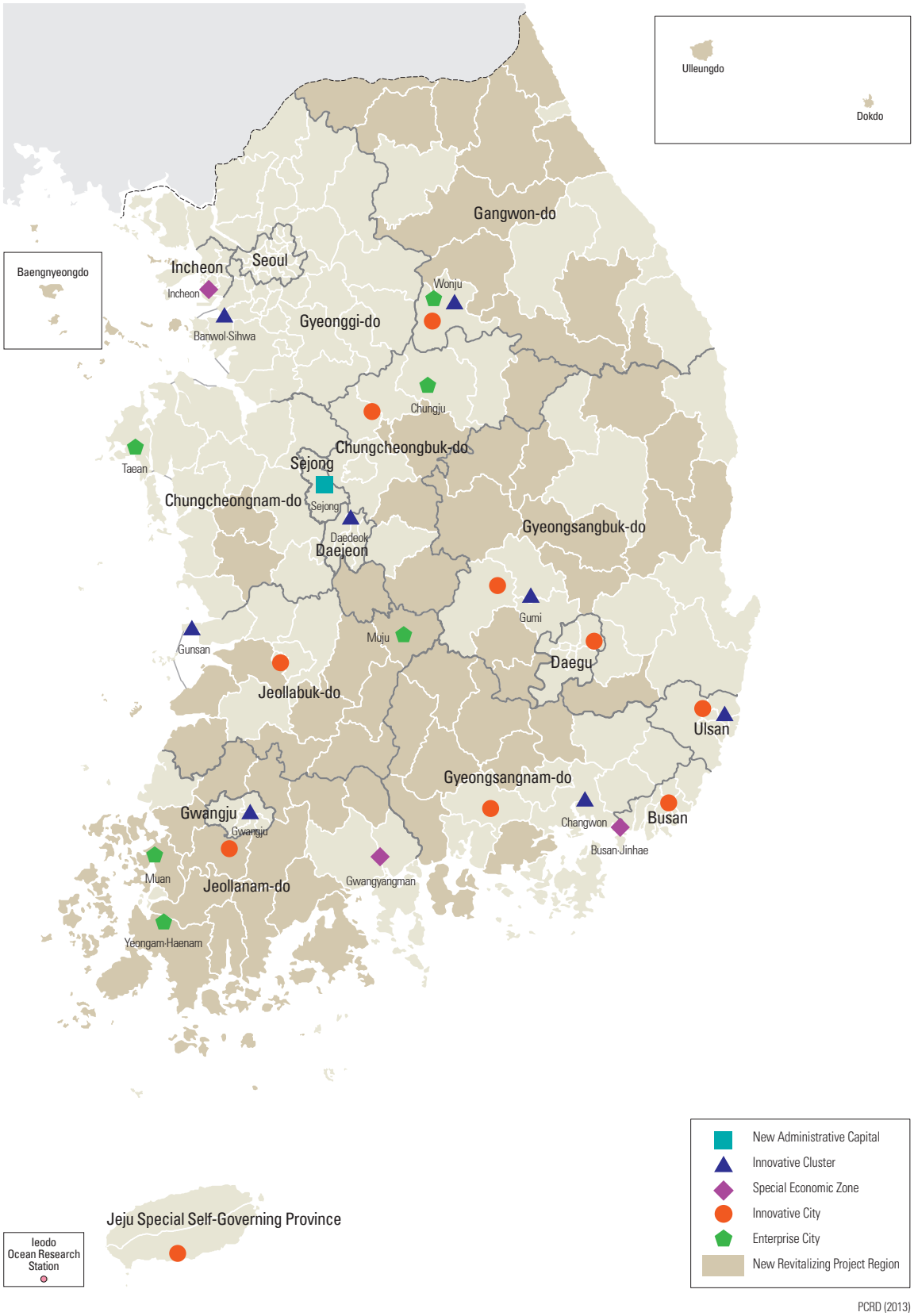
The Roh Moo-hyun government (2003 -2008) identified two major regional problems: the deepening regional disparity due to the capital region’s polarization and the capping of national income at 10,000 USD-both of which resulted from the inherent limits of an extensive growth strategy. In response to these problems, the government adopted a vision of regional policy that aims at establishing a multi-centered regional development network. This network of initiatives was meant to be innovative, quality-oriented, and decentralized so as to optimize its value to a specific region and its people. The government presented a multi-faceted policy scheme that included innovation policy, balance-oriented policy, industrial policy, spatial policy, and quality-oriented development policy. For the execution of this approach, it also established an implementation system administered by the Presidential Committee for Balanced National Development and the Special Account for Balanced National Development. In addition, the Roh Moo-hyun administration’s innovation policy, industrial policy, balance-oriented policy, and decentralization policy all utilized the existing administrative units of Metropolitan City, Do, Si, Gun, and Gu (provinces, cities, counties, and districts) as basic spatial units for regional policy.

The Lee Myung-bak government (2008 -2013) identified the following major problems affecting regional development: the weakening global

competitiveness of regions, the widely dispersed small scale investments by administrative units, poorly differentiated development, insufficient regionally led development capability, consumptive regional competition, and regional conflicts.

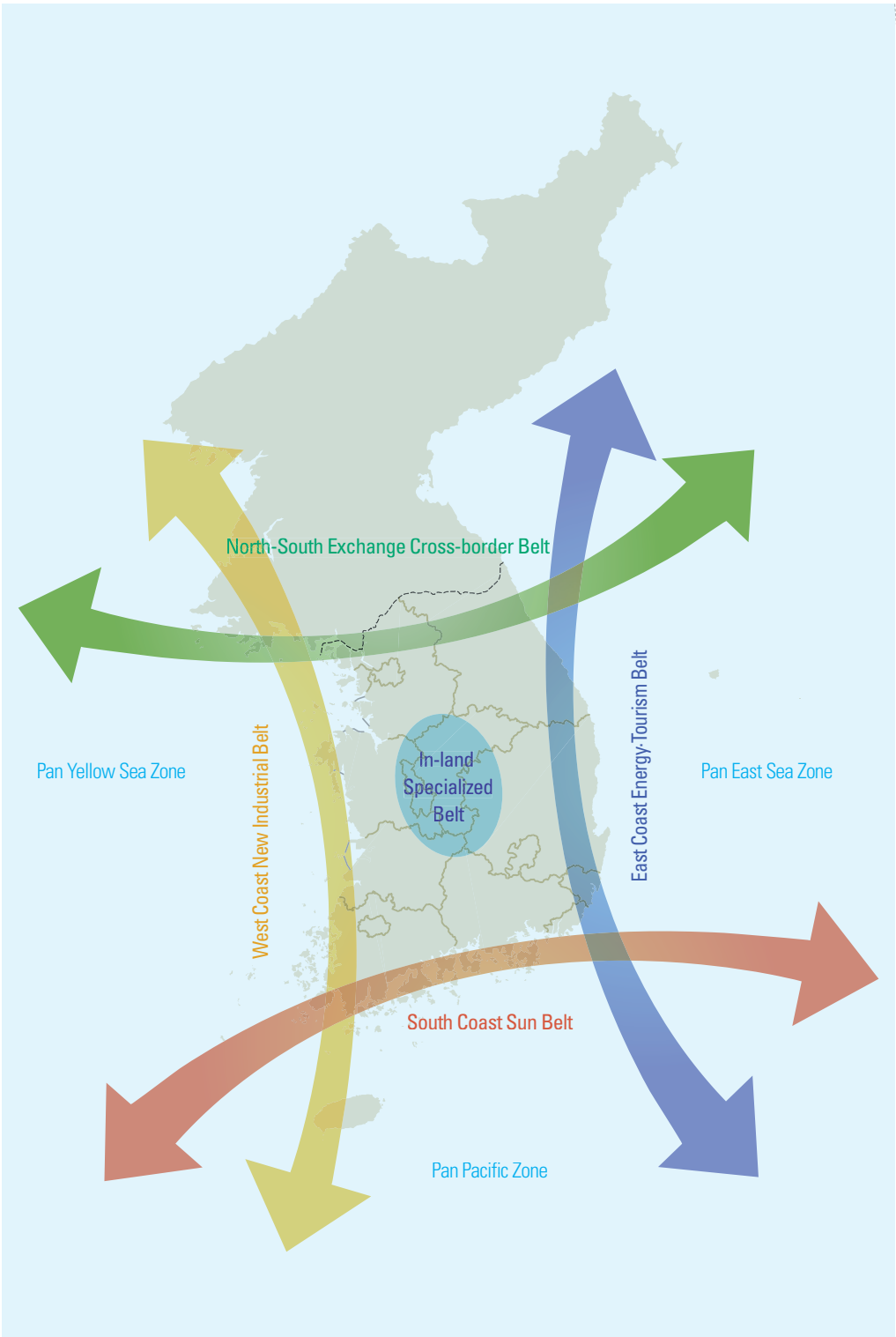
In response to these problems, the government established a vision of regional policy that sought to create competitive regions in order to secure jobs and improve quality of life. Furthermore, the new policy aimed to form economic regions that could respond to the globalization trend. It also initiated developments based on regional features. It organized regionally based development through decentralization. It also set out to emphasize regional autonomy, and cooperation and co-development across regions. For policy execution, it also established an implementation system administered by the Presidential Committee for Regional Development and the Regional Development Special Account. In addition, the government reclassified the 16 existing Metropolitan Cities and Provinces into seven separate Economic Regions. It implemented leading industry projects accordingly, including projects focused on the creation of talent through education along with 30 primary social infrastructure projects. It also presented the Seven Supra-economic Regions Development Plan in order to promote inter-economic regional cooperation and global cooperation with neighboring countries.

Regional Development Policy of the Roh Moo-hyun Government

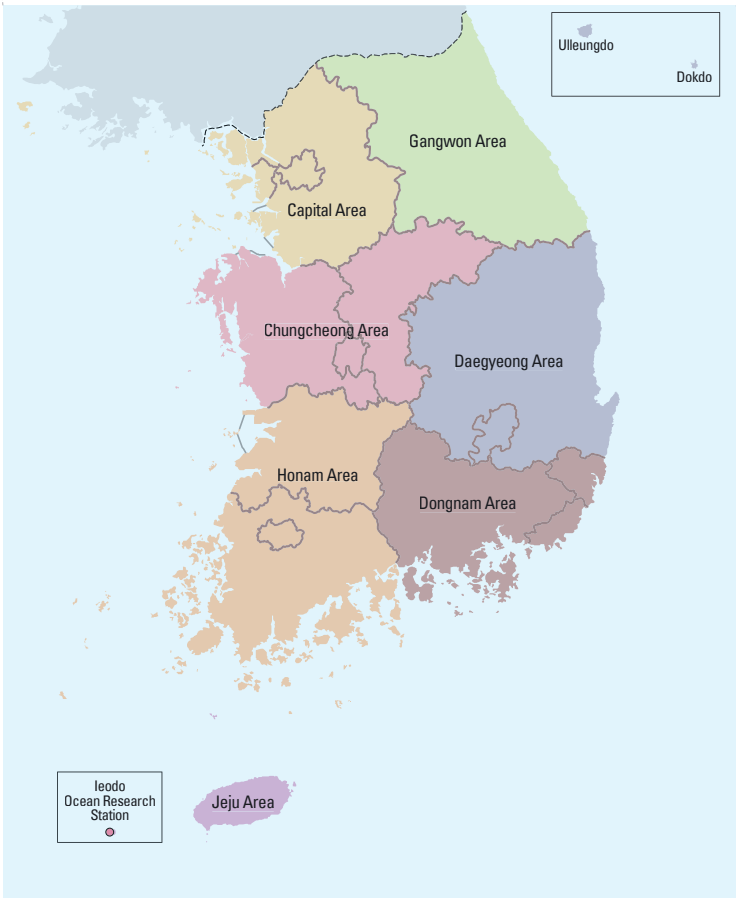


Regional Development Policy of the Lee Myung-bak Government

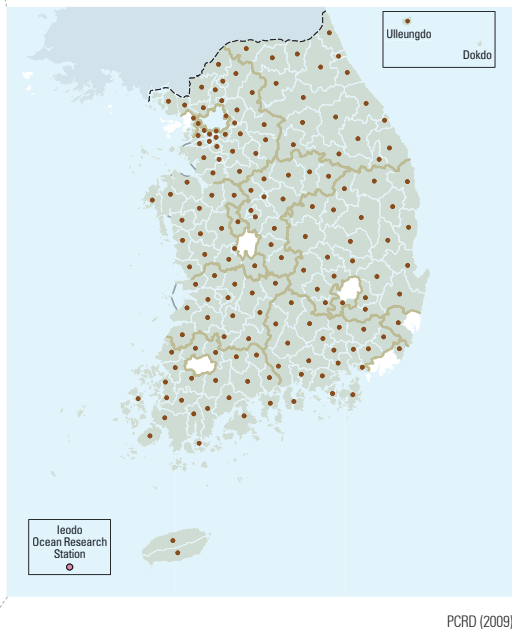
5 Supra-economic Development Region



5+2 Economic Region



163 Daily Living Sphere



Outline of Regional Development Policy during the Park Geun-hye Government

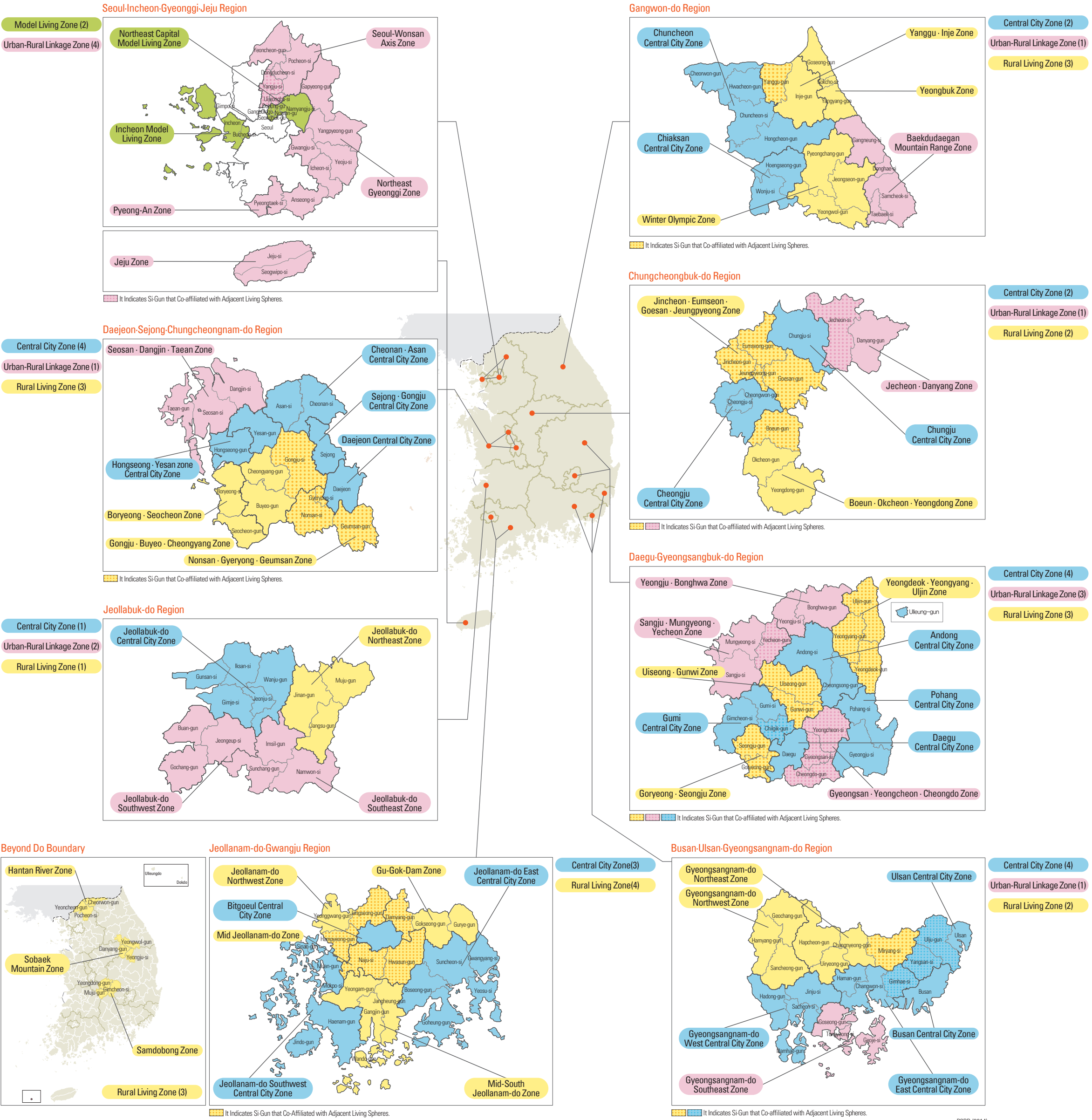
The Park Geun-hye government (2013-present) has created a new vision of regional development that seeks to promote “happiness to people, and hope to regions.” Her administration has vigorously pursued the regional HOPE Project in an attempt to help people realize happiness and hope in their real lives. The idea behind this approach is that the opportunity for a happy life can be achieved through the residents’ partnership with local government. Specifically the project attempts to foster citizen participation in governmental processes and to help address and remove

policy blind spots throughout the country. In order to achieve this vision, the government presented three promotional strategies: realizing regional happiness in daily living, tailoring package-based policy support toward this end, and enforcing regionally-based cooperation. The “Happy living sphere” specifically refers an attempt to ensure that the basic social, cultural, and physical needs are provided for all residents. The approach is comprehensive and incorporates central cities, rural central towns, and villages.

Concept of the HOPE Area



Design of the HOPE Area

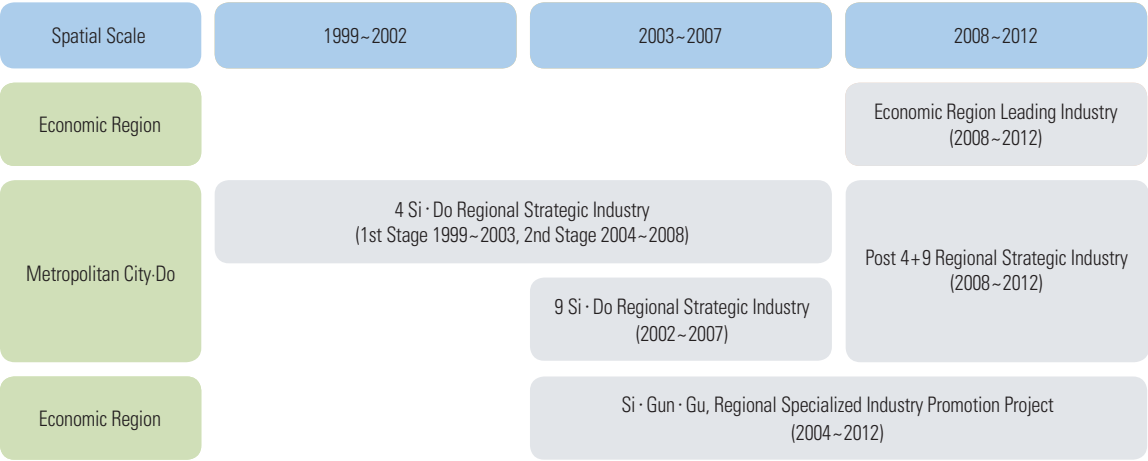


Regional Development Outcomes: Industrial Production and Infrastructure

Since the late 1990s, Korea has been intensively promoting its regional industrial policies. These regional industrial promotion policies are similar to the general regional policies, and also include both policies initiated by the central government as well as those created by the local governments. Recently, the participation of local self-governing bodies has increased. In particular, the targeting of a certain industry or industries has become a main measure of regional industrial promotion policy; in this respect, bottom-up promotion planning from local

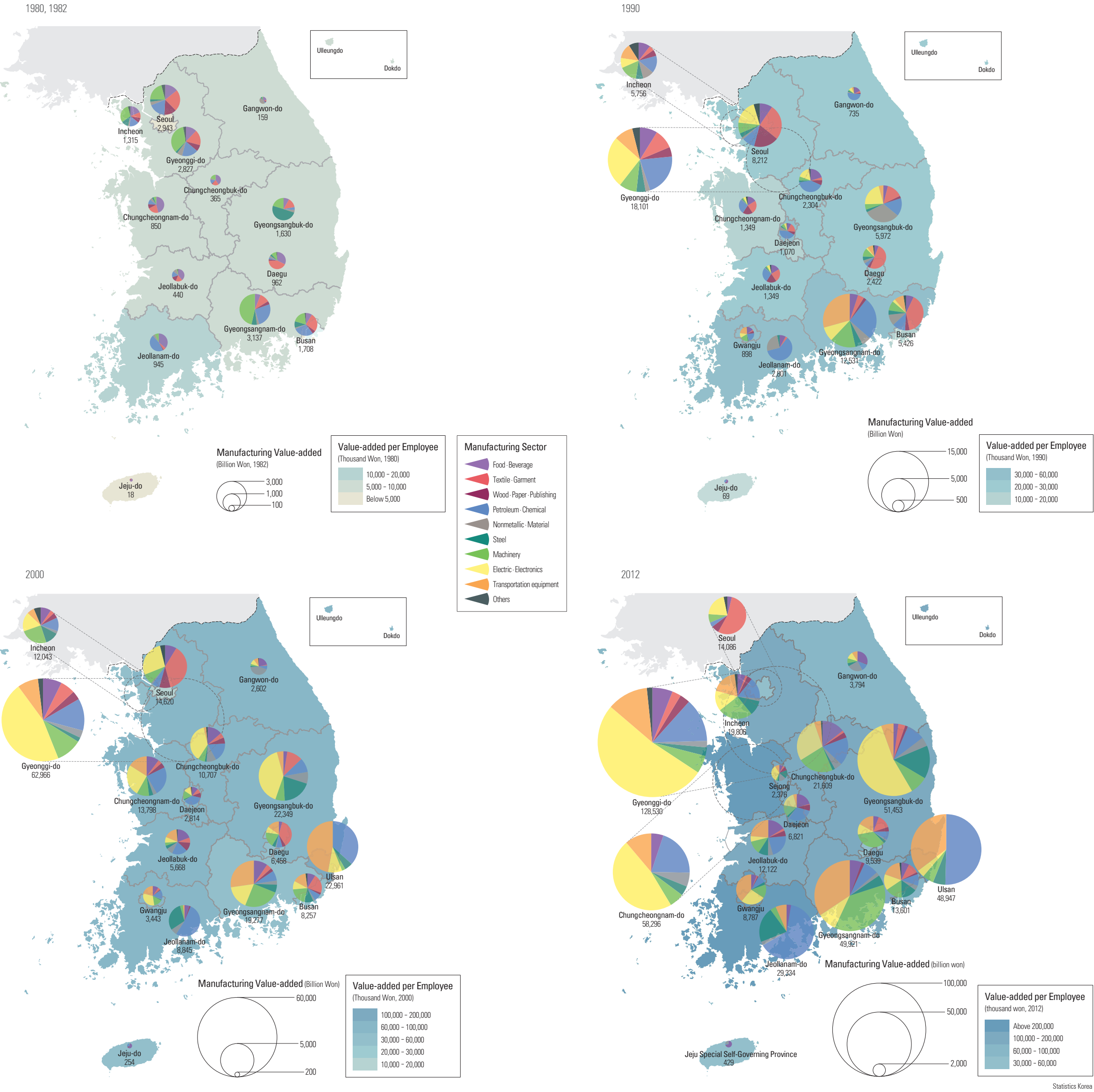
governments has become absolutely essential. In 1999, four regional industrial development plans were established. At that time, the central government established the promotion plan and provided financial support for constructing industrial infrastructure while macro-level local governments worked with the central government on selecting target industries and providing limited financing for such. Throughout the Roh and Lee governments, the participation of macro-level local governments expanded.

The Transition of Regional Industrial Promotion Policies (1992~2012)



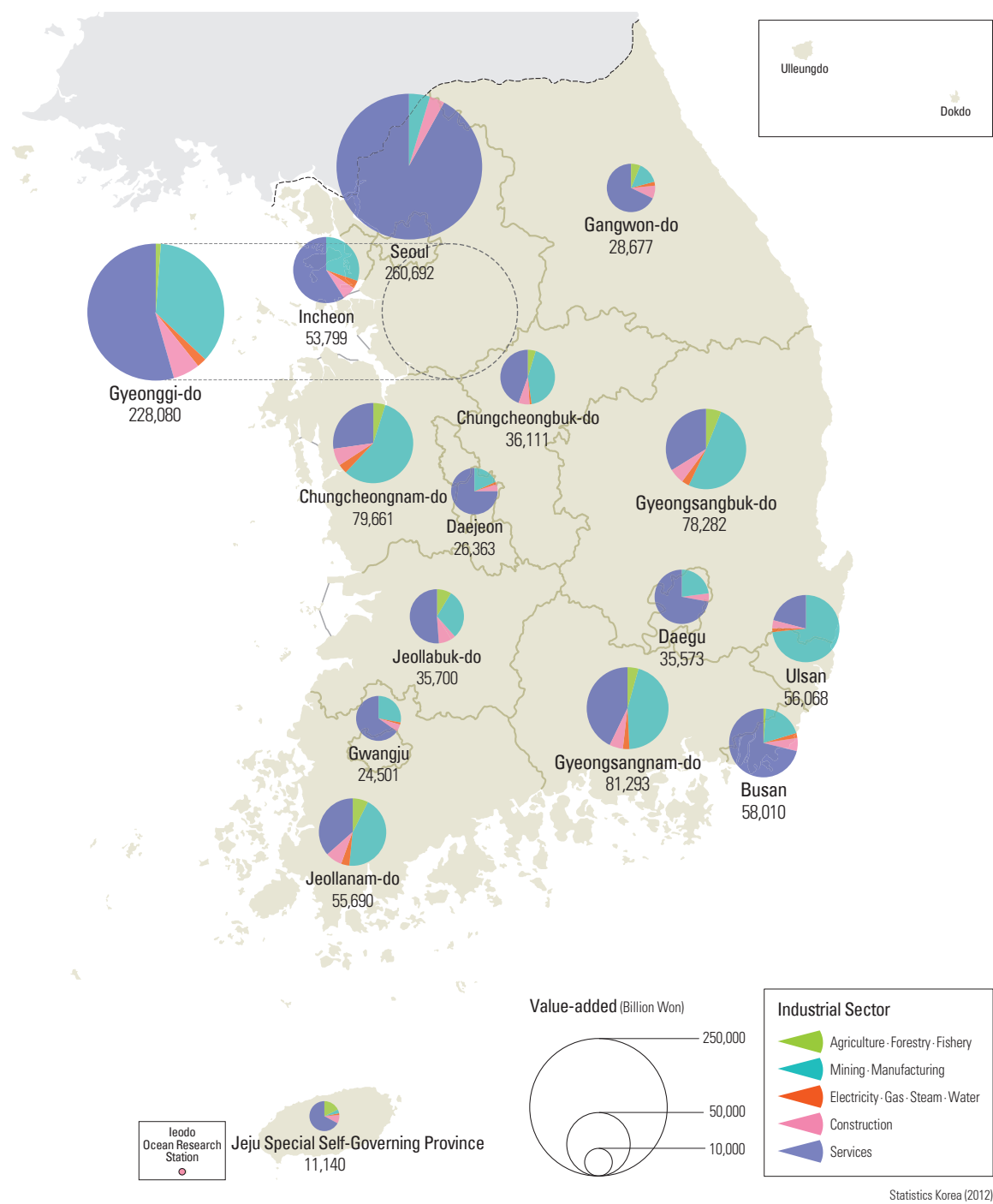
KIET (2013)

Manufacturing Value-added and Sectoral Composition

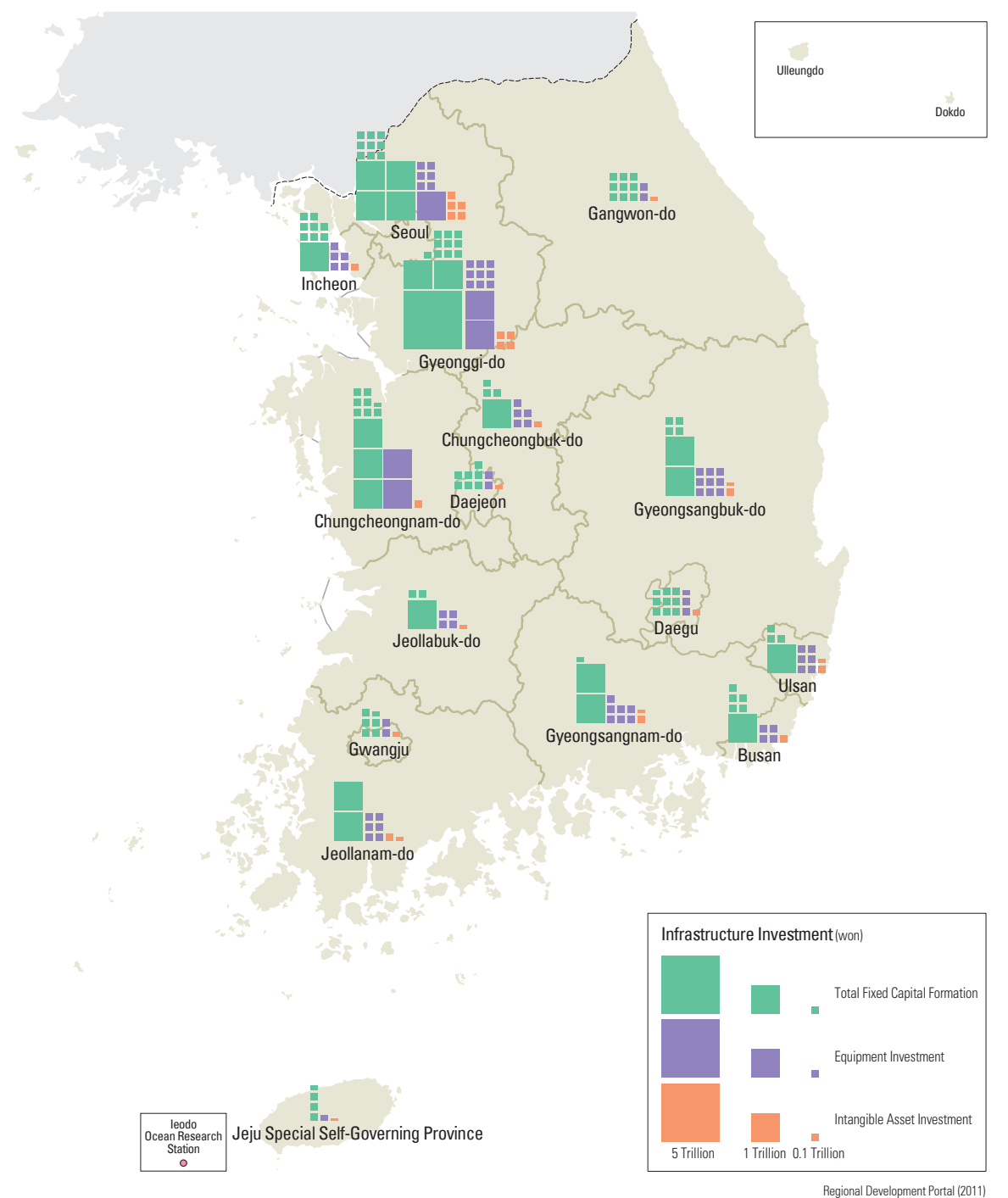


Statistics Korea

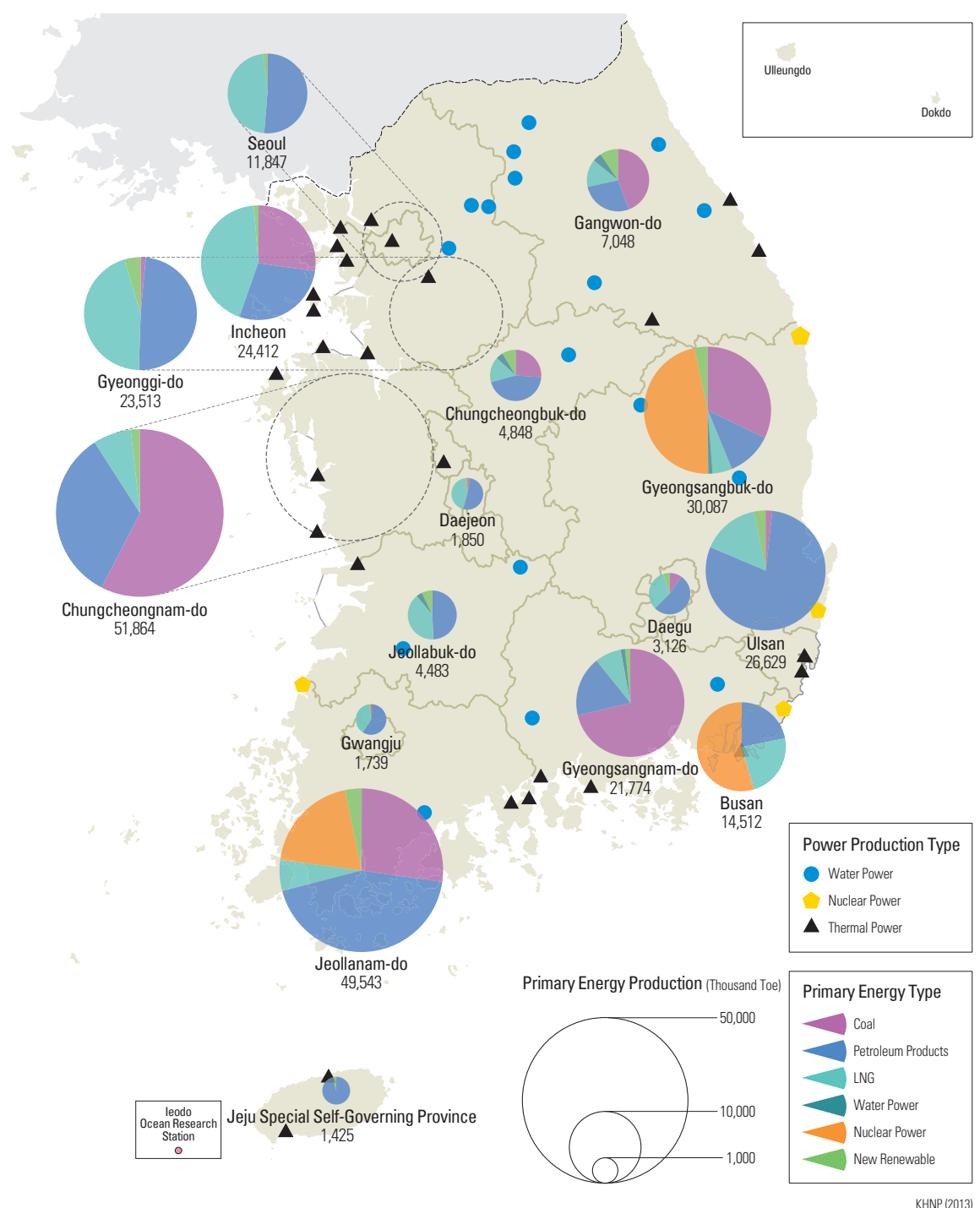
Industrial Production Composition



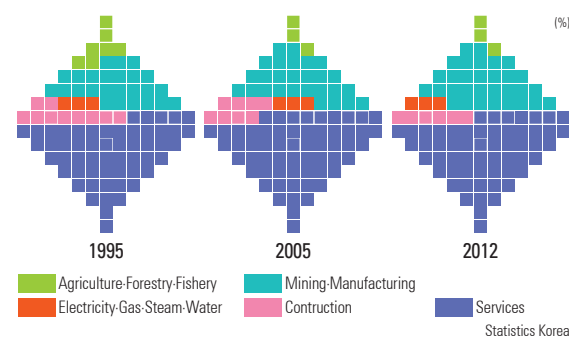
Infrastructure Investment



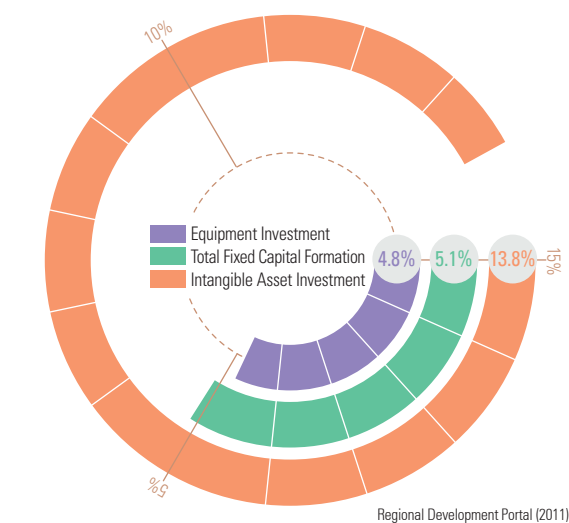
Energy Supply



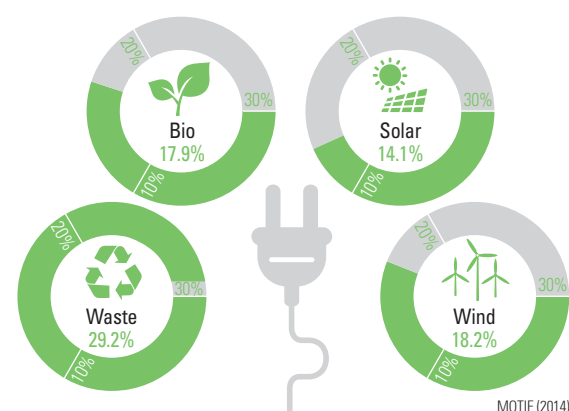
Changing Industrial Structure



Annual Average Change of Infrastructure Investment (1995~2011)



Major New Renewable Energy Sources in 2035

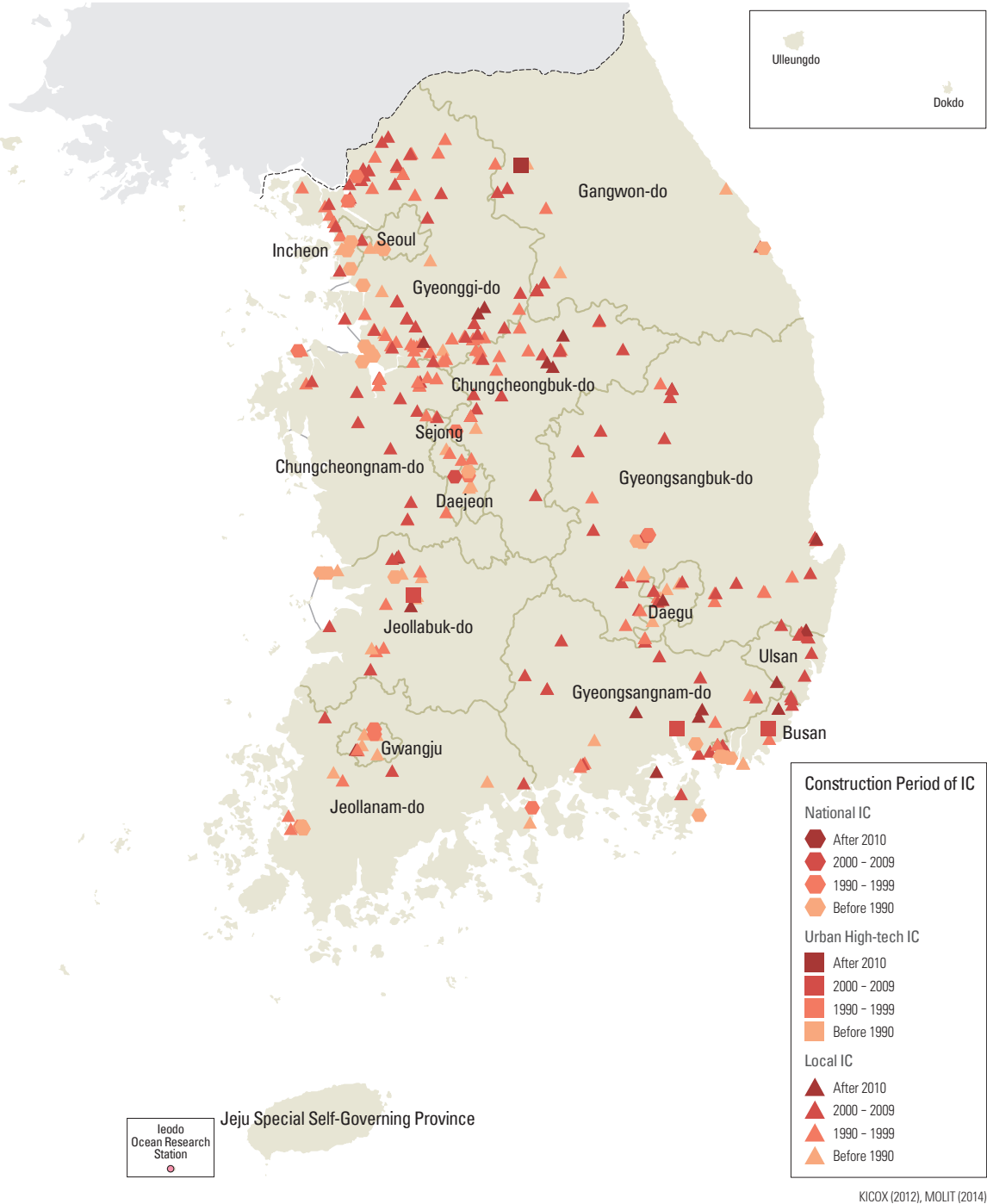


Regional development, in general, brings about the transformation of each region's industrial structure. Since 1995, the industrial structures of all provinces in Korea have experienced drastic transformations. Based on the contributions of local regions, the national industrial structure also experienced remarkable changes with a rise in the service sector and a decrease in agriculture, forestry, and the fishery sectors. In particular, the ratio of the manufacturing sector is higher than that of the average of OECD countries, and the extent of spatial concentration also has increased since 1995.

The promotion of regional development entails the investment in the infrastructure in local regions. Since 1995, the total fixed capital formation increased by 5.1%, equipment investment by 4.8%, and intangible assets investment by 13.8%. During the same period, the increase of total fixed capital formation was higher in traditionally industrial regions such as Chungcheongnam-do, Ulsan, Incheon, and Gyeonggi-do. In addition, the spatial concentration of all total fixed capital formation, equipment investment, and intangible assets investment have increased, which indicates that infrastructure investment tends not only to increase but also to concentrate spatially.

Another factor that has played a role in Korea's regional industrial growth is the increase in the number of power plants, which have in turn provided the energy needed for fostering further industrial activities. All 23 of the nation's nuclear power plants concentrate spatially in three regions: Busan, Gyeongsangbuk-do, and Jeollanam-do. Thermoelectric power plants, on the other hand, show a comparatively even spatial distribution.

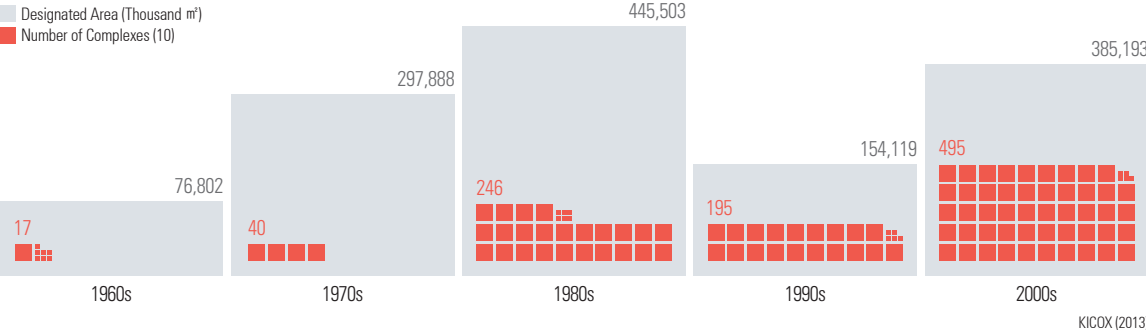
Change of Industrial Complex Distribution



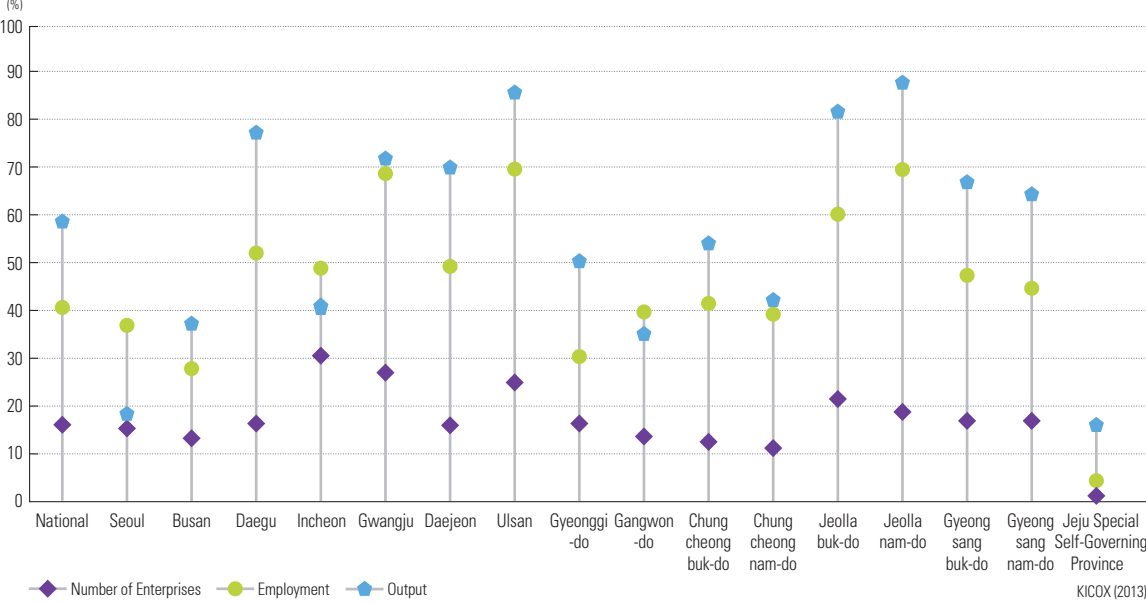
Since 1962, when the first national industrial complex was built in Ulsan, the years that followed witnessed the construction of a thousand industrial complexes. During these years, these industrial complexes were among the most important players in transforming Korea from one of the poorest countries in the world to the economic powerhouse that now provides 20,000 USD per capita income as well as of 1 trillion USD in trade volume.

The industrial complexes in Korea increased in both number and distribution from the 1960s to the 1980s, but the growth which stagnated in the 1990s rapidly increased again in the 2000s. Today, the industrial complexes account for 62% of total manufacturing production, 79% of total exports, and 42% of total employment: all of which make a significant contribution to the overall health of the national economy.

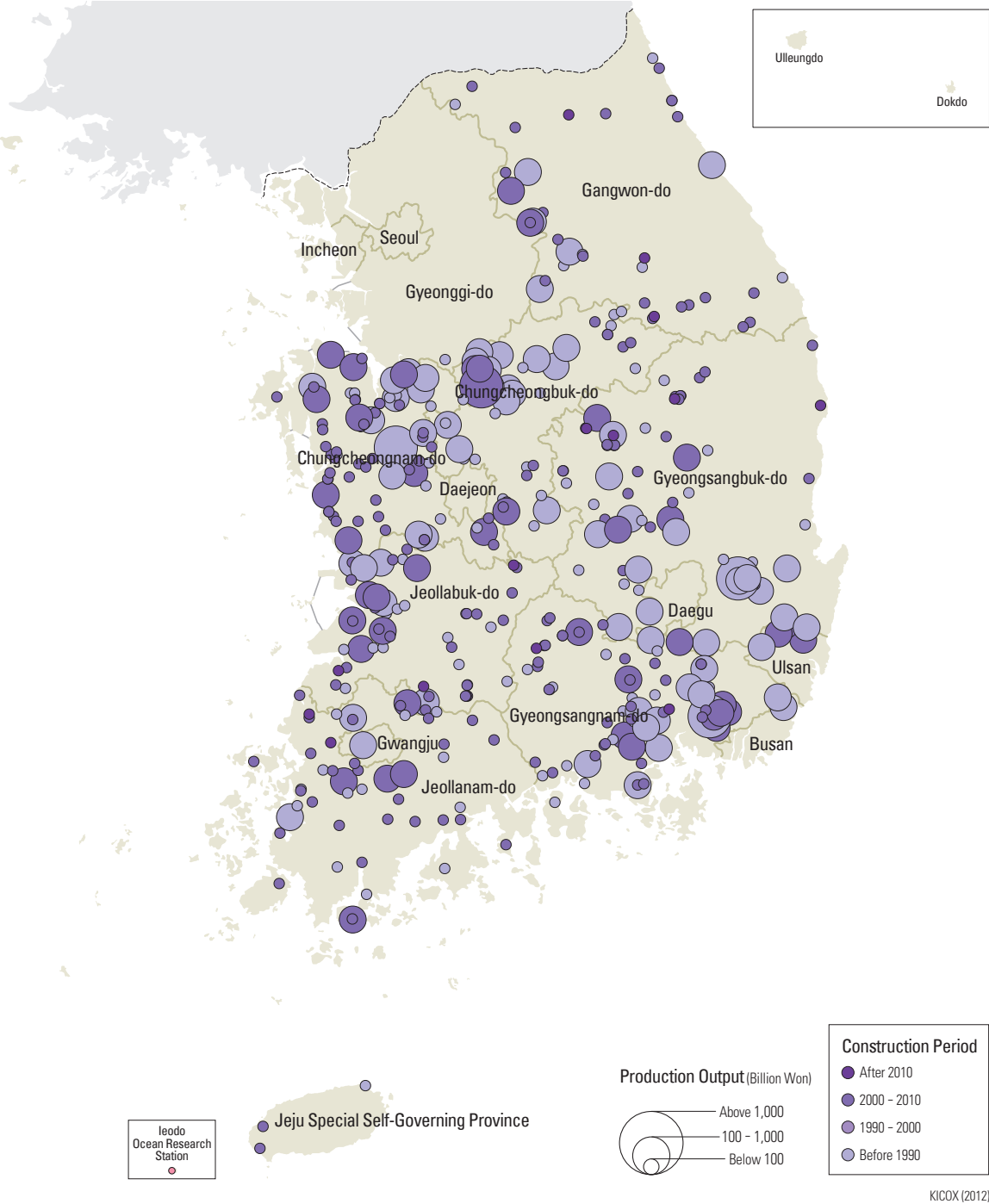
Designation of Industrial Complexes



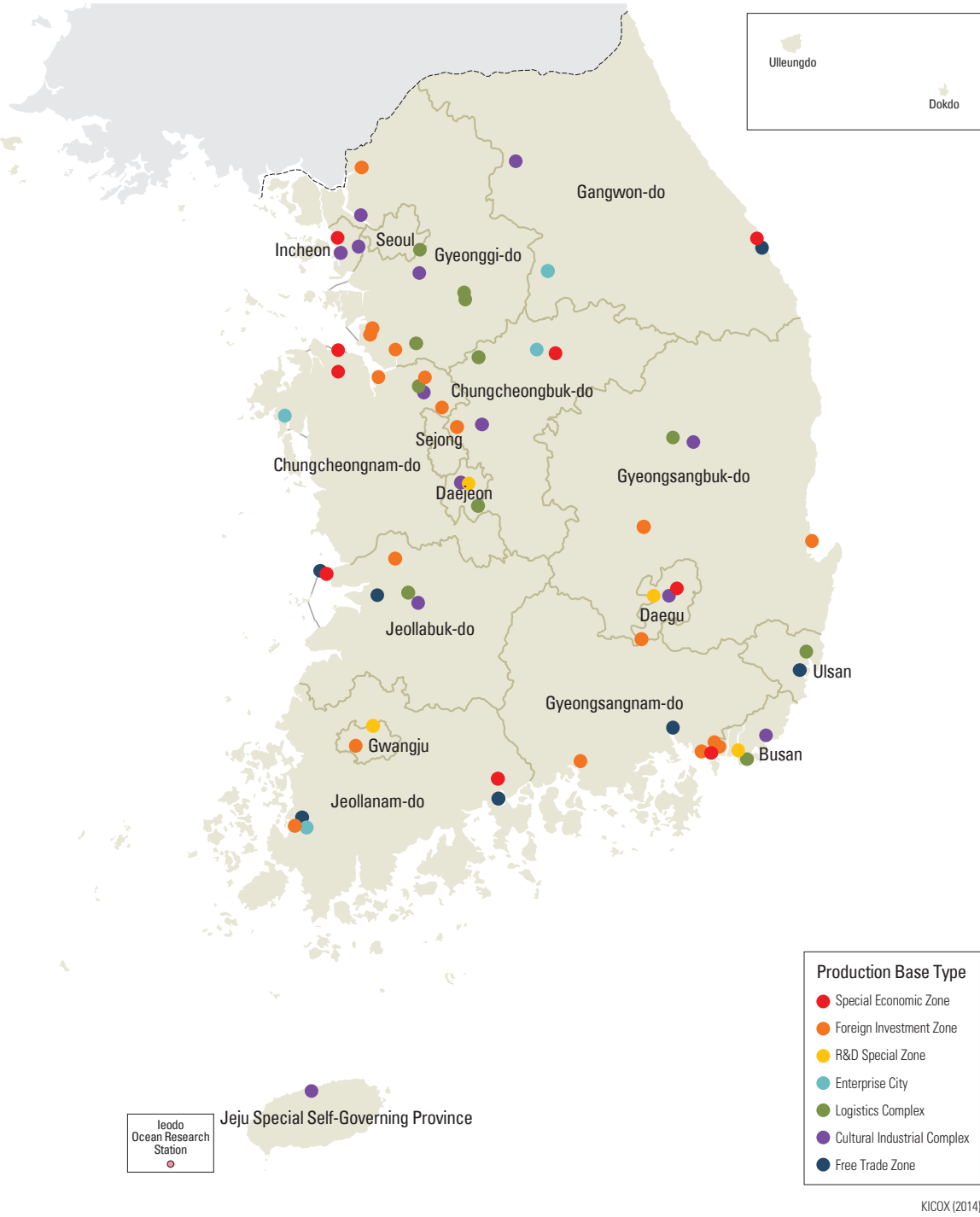
Contribution of Industrial Complexes to Regional Economy



Change of Agricultural Industrial Complex Distribution

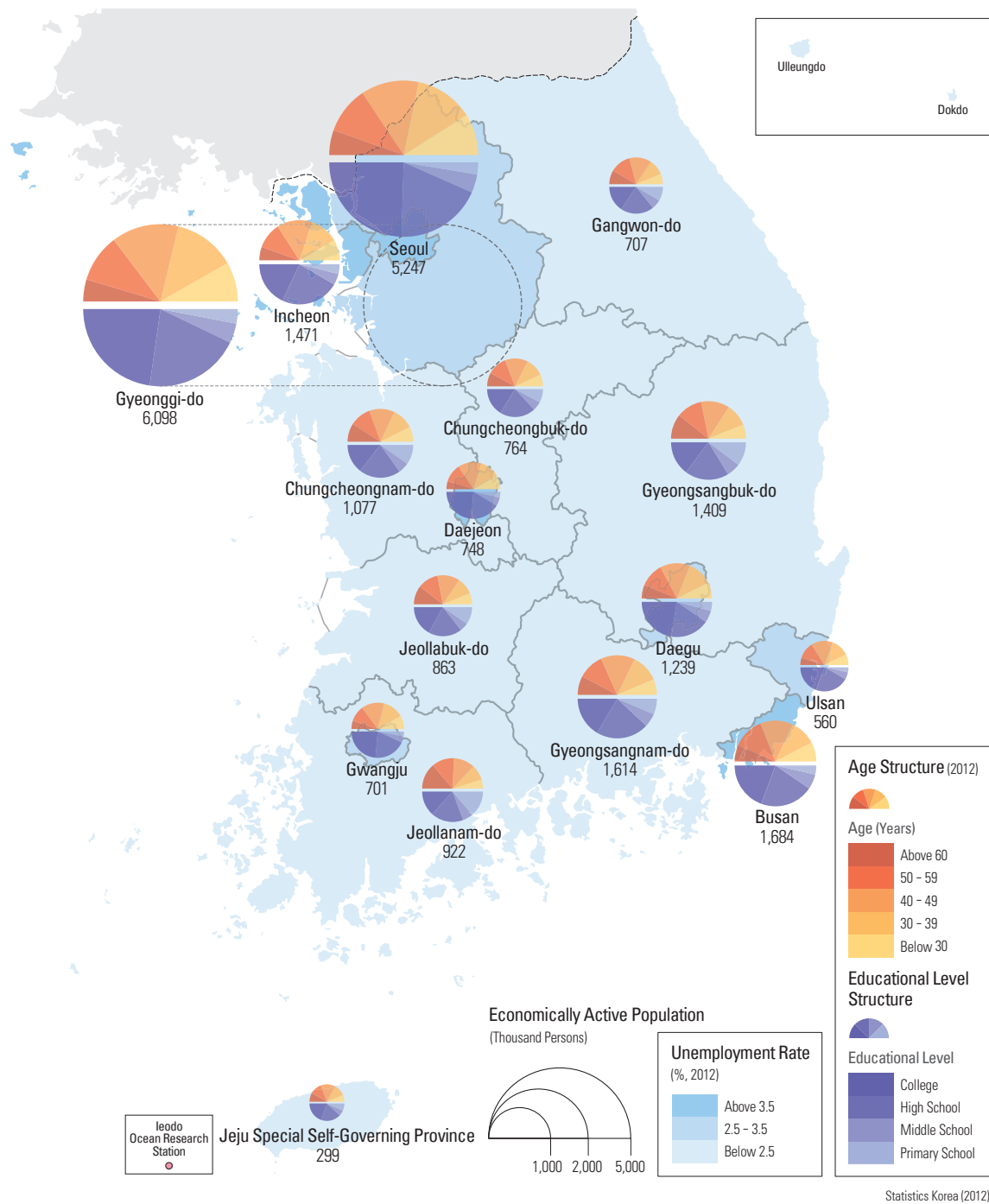


New Industrial Production Bases

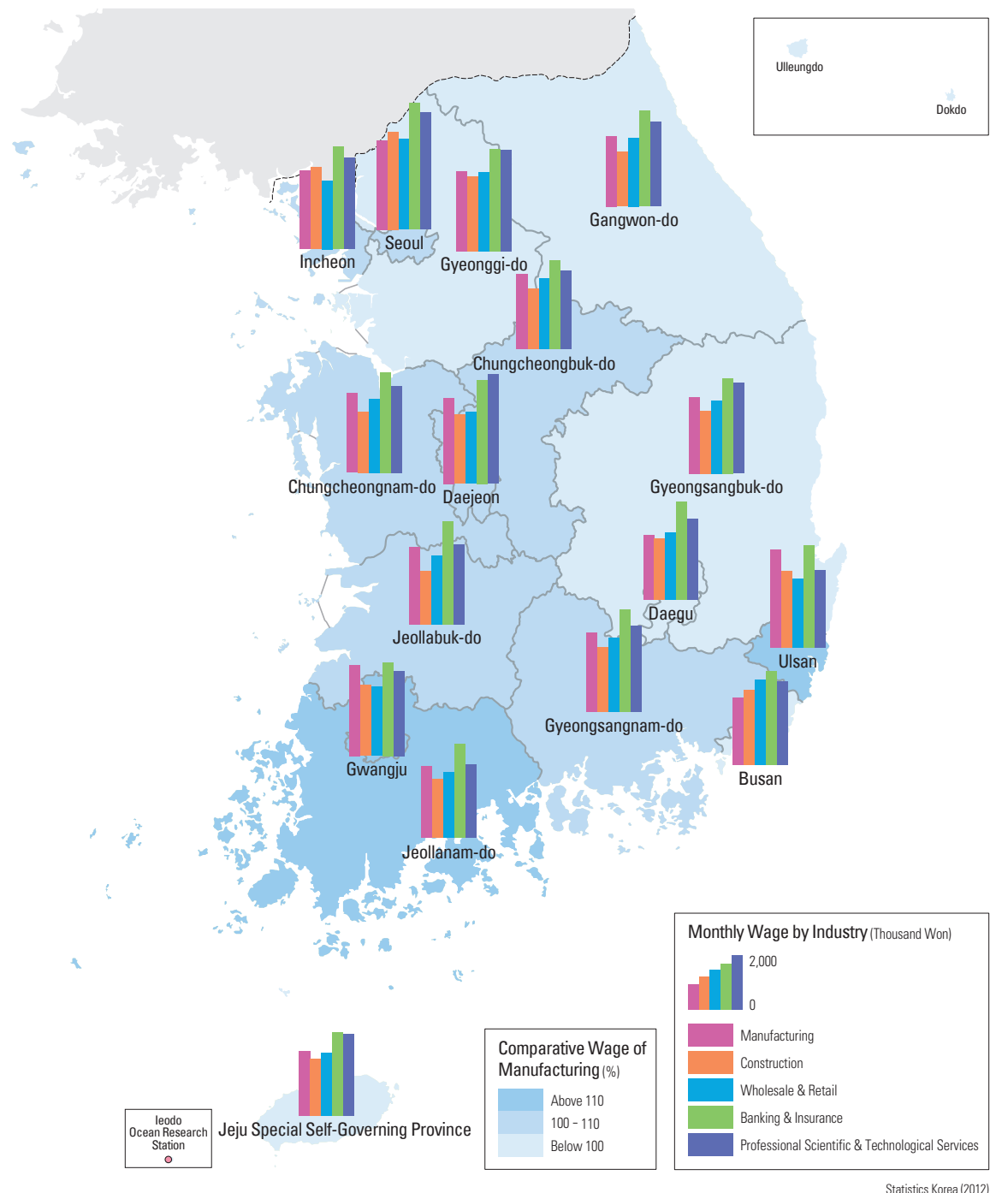


Regional Development Outcomes: Human Capital, Research and Development

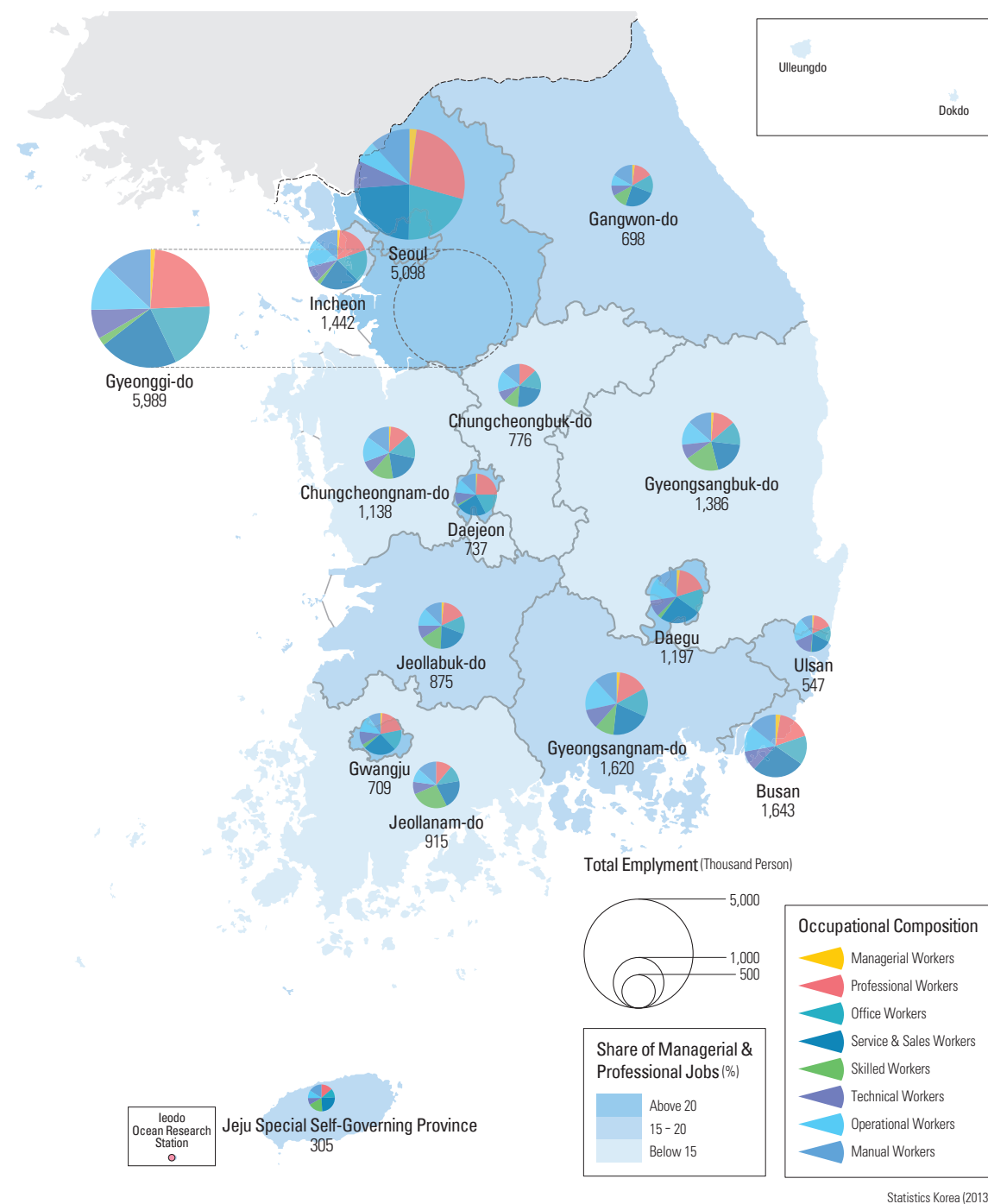
Structure of Economically Active Population



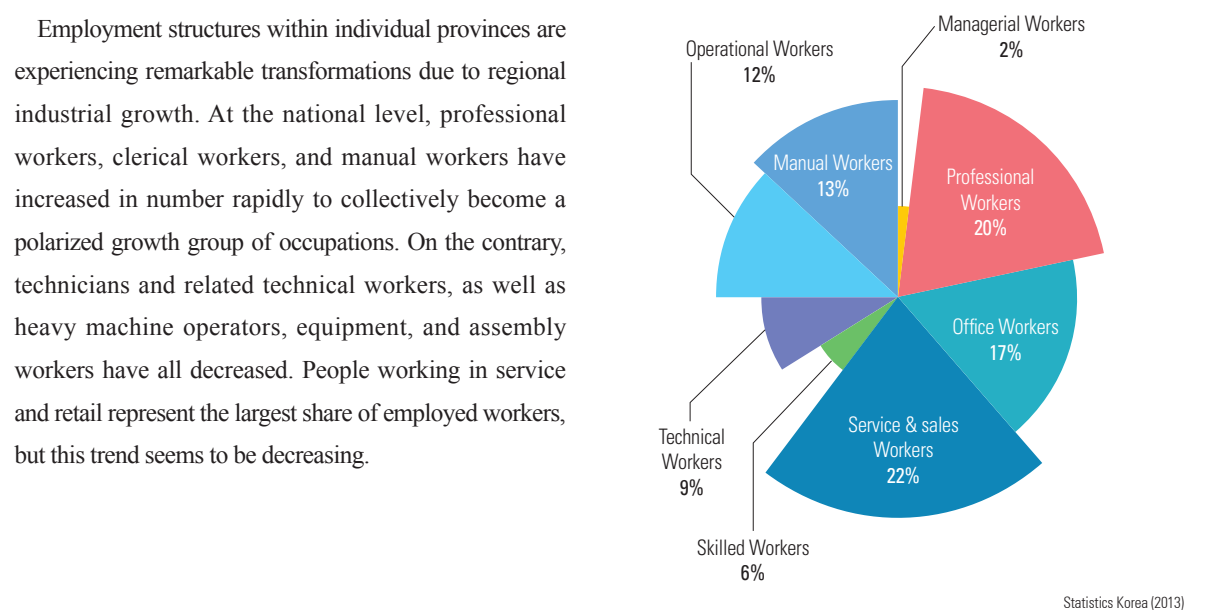
Wage Level by Industry



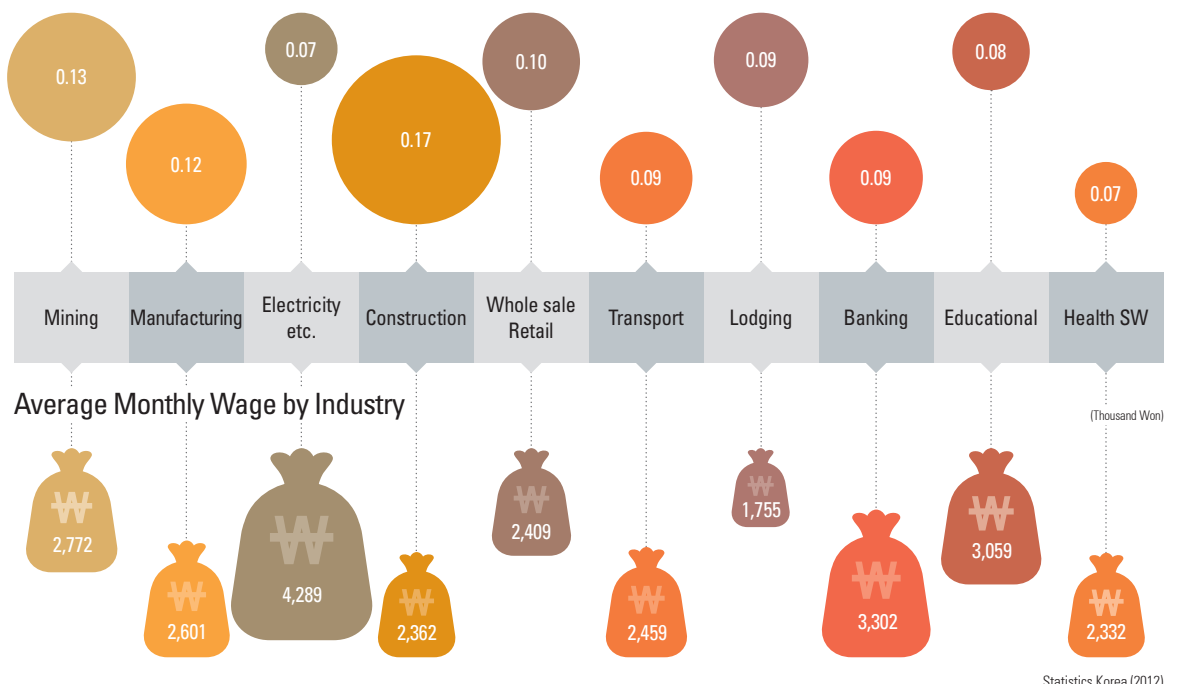
Occupational Structure



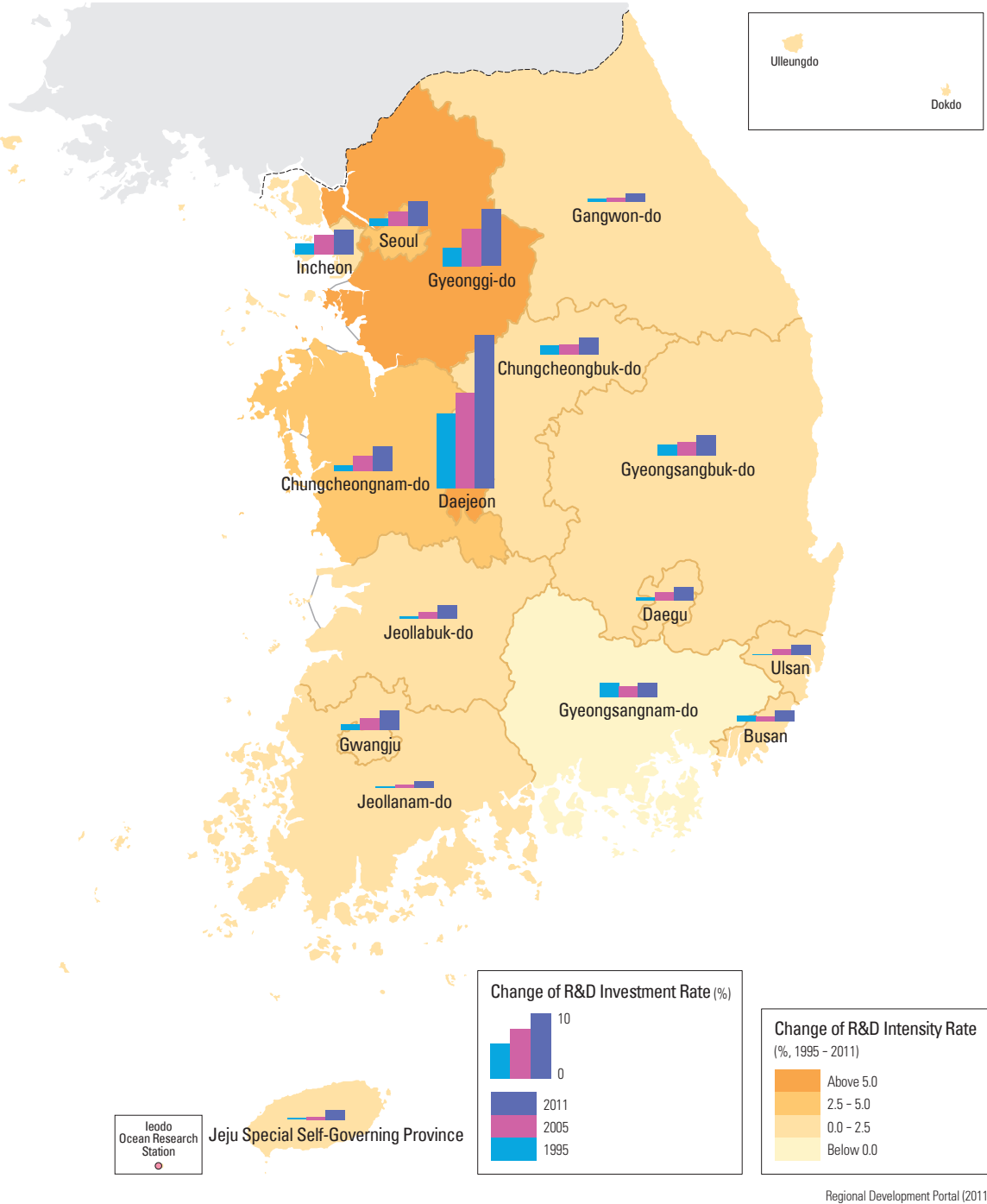
Occupational Distribution



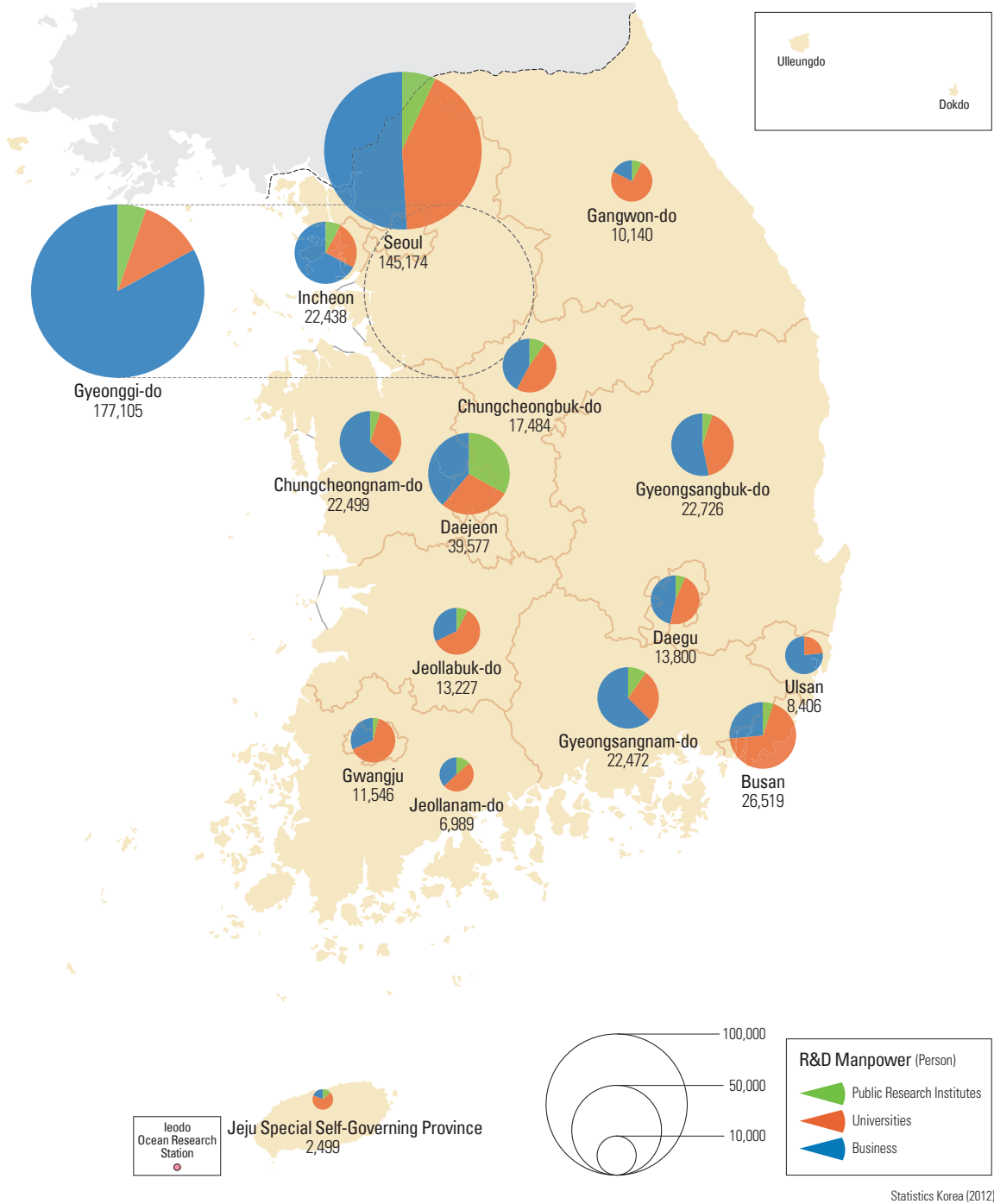
Regional Wage Disparity by Industry: Coefficient of Variation



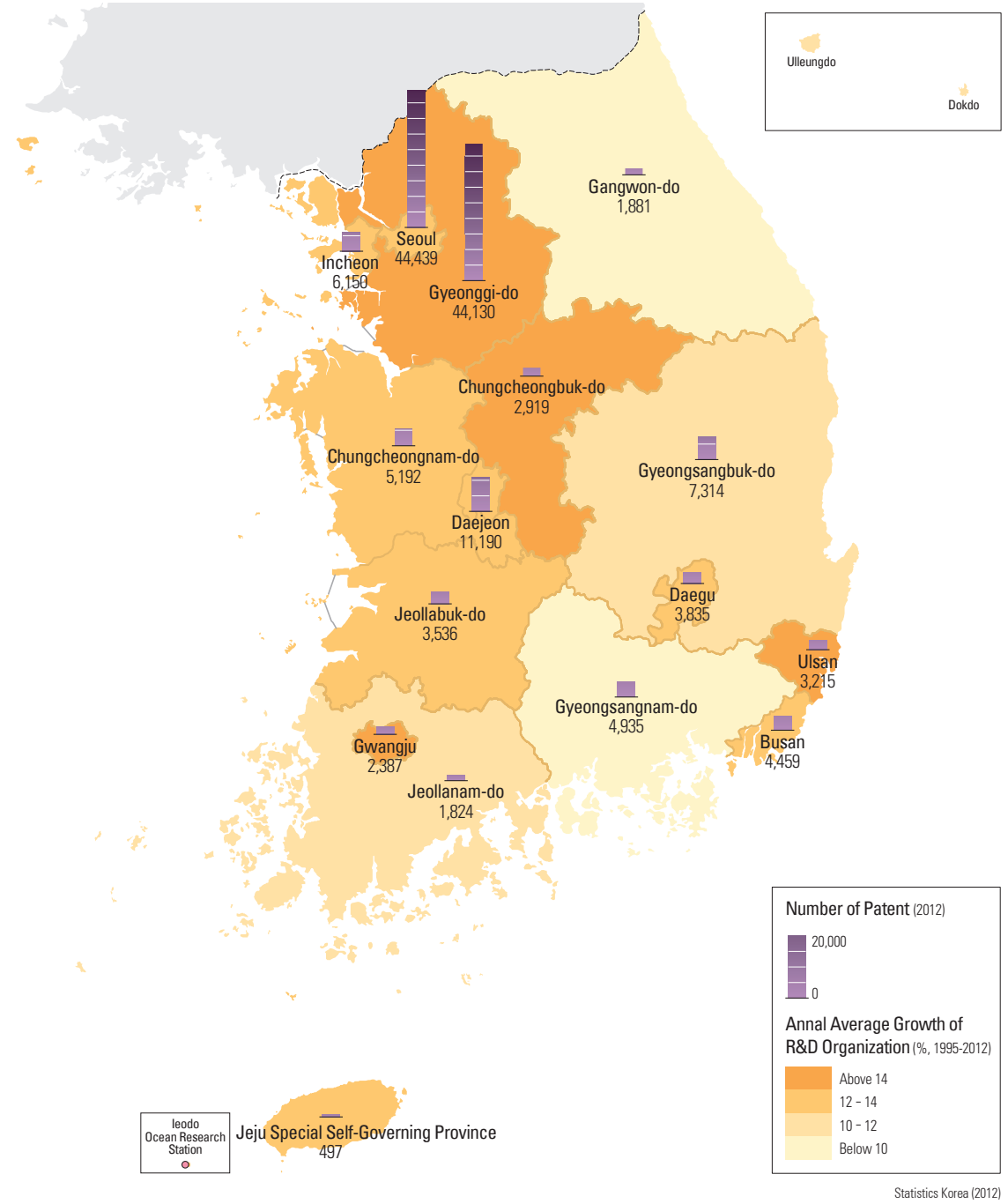
Changing R&D Investment Rate and Intensity Rate



R&D Manpower



R&D Organization Growth and Patent

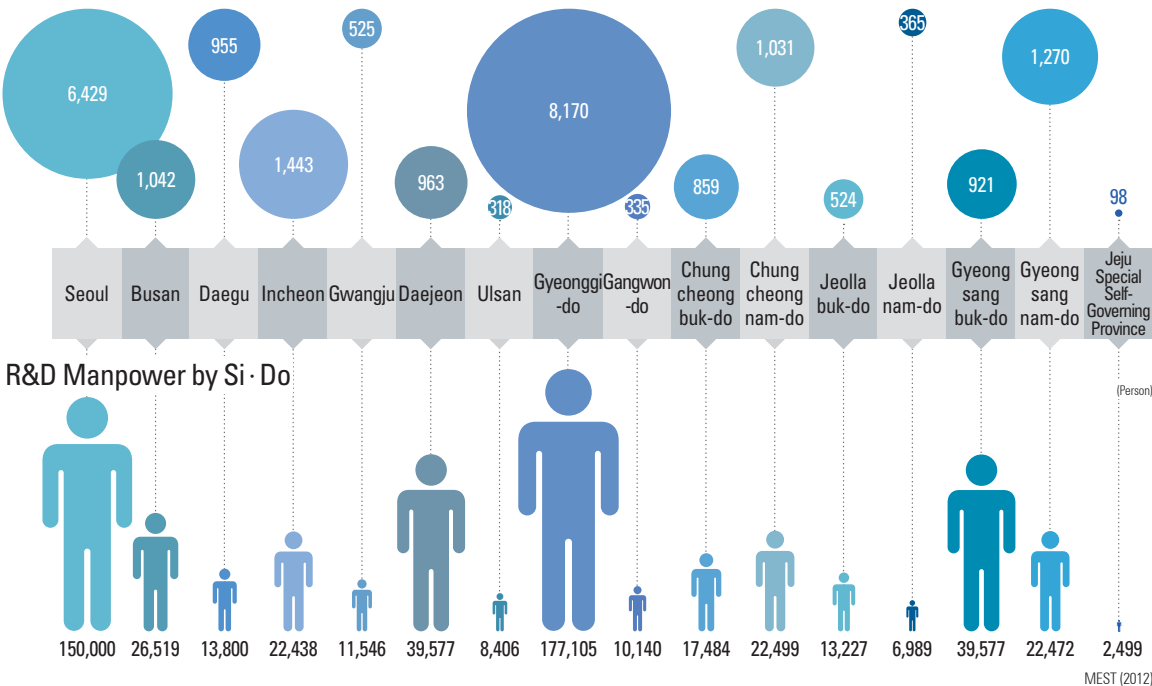


With the transition to knowledge-based and creative economies, research and development (R & D) and regional innovation-related capability became critical factors in determining both the outcome of regional development and regional growth potentials for the future. Even though research and development investment as a percentage of GDP in Korea is now higher than the OECD average, the Korean government still maintains its focus on intensifying innovation capacity for regional industrial growth. This policy to continue research and development support is based on the argument that regional innovation-oriented policies can indeed support regional innovation, promote technological transfer effects, and improve continuous and self-sustainable regional growth.

The research and development investment that contributed to the remarkable economic success in Korea shows clear spatial disparity across different provinces. This spatial disparity is considered a significant regional problem; however, it can be used to gauge the effects of disparity on regional economic growth, and furthermore it could have a decisive impact on the future potential for regional growth.

Spatial inequality in research and development is also apparent in the distribution of research and development organizations across the provinces. The capital region consisting of Seoul, Incheon, and Gyeonggi-do alone accounts for 63.5% of total organizations devoted to innovation in the nation, which is to say it clearly is the key hub for research and development activities in Korea.

R&D Organizations by Si · Do



Economy and Industry

The economic transition in Korea over the past 60 years can be easily attributed to both industrialization and globalization. As its industrial structure progressed rapidly from the incorporation of primary industries to the inclusion of secondary and tertiary industries, Korea achieved highly compressed economic growth. The industrial policy, especially in light of the government's export-oriented development strategies, was a success. However, as both internal and external circumstances have changed since the 1980s, restructuring became necessary; efforts to develop intellectual talent and to conduct research and development activities were made across all industries. The government focused on fostering the private sector; and as a result, the status of chaebols (Korean conglomerates) grew continuously.

Assessing Korea's economic status through the interpretation of its national GDP in world rankings indicates an upward trend. Korea was ranked 31st in 1960, 41st in 1965, 32nd in 1970, and 30th in 1975. It then steadily moved up to 28th in 1980, 18th in 1985, 15th in 1990, and 11th in 1995. It has been residing in the 12th-15th range for the last decade.

Since the founding of the Republic of Korea in 1948 until the early 1960s, Korea's economy depended primarily on agriculture, and its economic system

and industrial structure resembled that of other underdeveloped countries. During that period, agriculture, forestry, and fishery accounted for more than 40% of domestic production and more than 60% of employment. On the other hand, manufacturing accounted for less than 20% of domestic production, and less than 10% of employment. This lack of manufacturing was due to the fact that under the Japanese colonial government the main facilities needed for war activities were located in North Korea. Additionally, those manufacturing facilities that were located in the South were heavily damaged during the Korean War. The 1950s post-war years ushered in a time of political, economic, and social confusion.

Since the early 1960s, Korea began to focus on economic growth through industrialization, and it was during this time that manufacturing became the key to Korea's economic development. During the Park Chung-hee administration, which began in 1961, economic development was placed at the center of its agenda when the Five-year Economic Development Plan was enacted in 1962. Export-led industrialization and economic growth were the new strategic foci, and the government-led industrial development policy was emphasized. In the 1960s, an export-led strategy based on light industries was promoted with fabric, plywood, wigs, and shoes becoming the main

exports. In the 1970s, the government began to promote heavy chemical industries and the main industrial focus shifted from light to heavy industries overall. The export products changed as well. In the early 1960s, minerals and raw silk were on the top of the list; however, these were replaced by fiber, clothing, and shoes between 1970 and 1980. After 1990, high technology products such as semiconductors and computers became important exports.

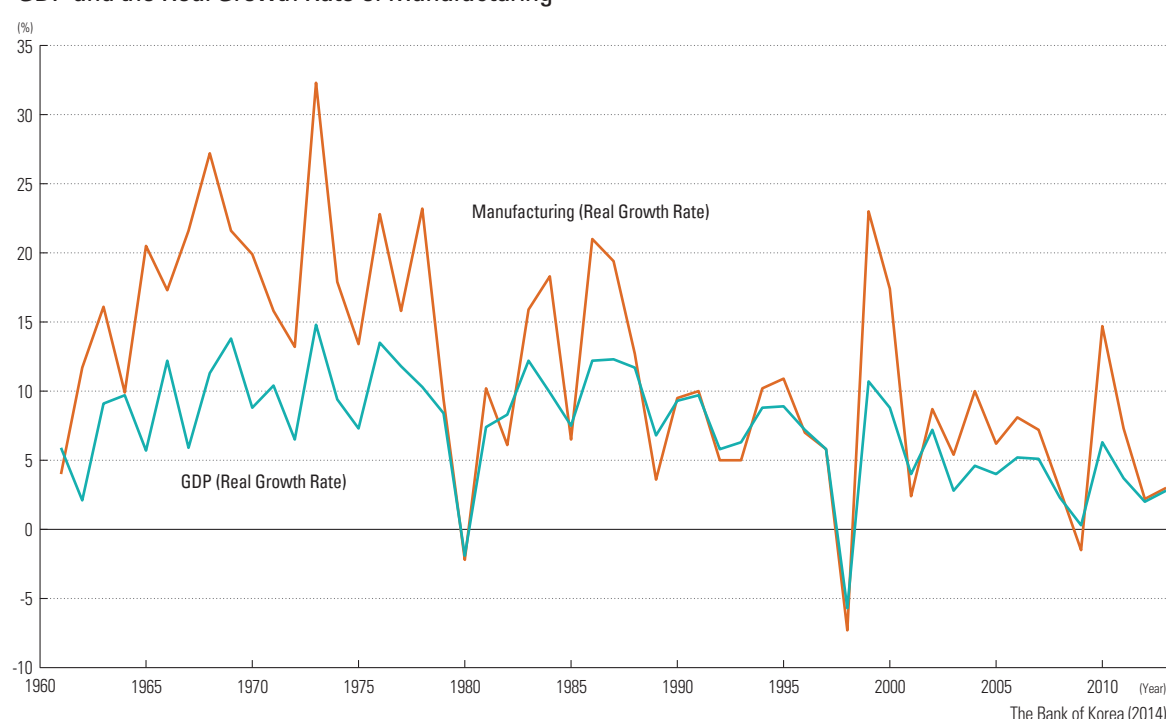
The economic growth trend indicated through changes in the nation's GDP real growth rate reveals that it increased from 4% in the pre-1960s to 8.4% in the 1960s; it increased to 9.0% in the 1970s and to 9.7% in the 1980s. This trend indicates that a high growth rate of 10% was sustained for a considerable period. Manufacturing, in particular, maintained a well above 10% average annual growth rate at 16.8% in the 1960s, 15.8% in the 1970s, and 12.2% in the 1980s even with decadal fluctuations. The high growth was especially visible from the early 1960s to mid-1970s. This pace slowed down after that and dropped to 6.5% in the 1990s and to a mere 4% in the 2000s. The significant drop came during the 1979 Oil Crisis, the Asian foreign exchange crisis in 1997, and the 2008 global financial crisis when the real growth rate of manufacturing industry recorded a negative trend. However, it soon recovered through successful economic

restructuring and once again realized growth even though the rate has been somewhat impaired.

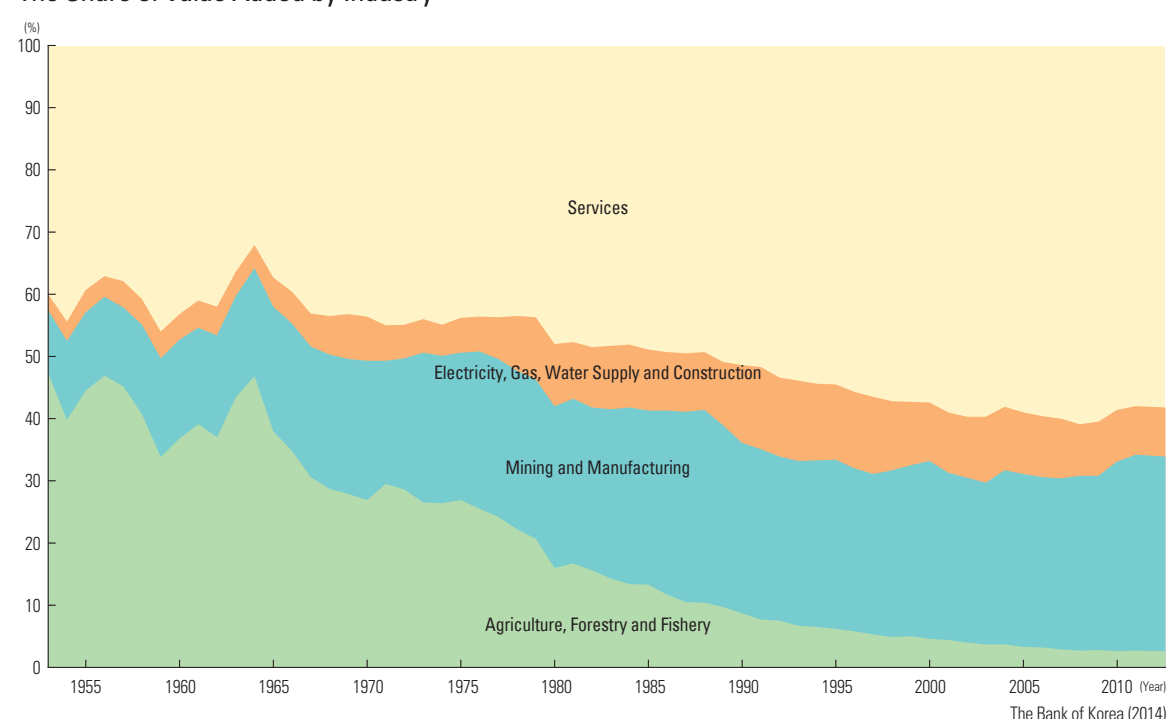
Agriculture, forestry, and fishery dropped from 40% in the 1950s to 3% in the 2000s while that of manufacturing increased from 12% to 27.4% during the same period. The service industry has soared from 41.1% to 59.5%. This implies that Korea's industrial structure rapidly shifted from primary to secondary and tertiary industries. Light industry led overall industrial growth between 1950 and 1970; however, it was surpassed by the heavy chemical industry, which rapidly grew since 1970.

The success in industrialization and globalization greatly impacted the national landscape. As a result, both industrial growth and population settlement concentrated in the greater capital area while major industries developed mainly along the Gyeongbu Axis. The government-led industrial policy, which began in 1960, resulted in growth pole development in certain areas, and the export-led industrial development occurred in the southeastern coastal cities due to their designation as export/import industrial centers. As a corrective measure to such imbalanced growth, factory regulation in the capital area was instituted, industrial facilities were relocated to rural areas, and local businesses were fostered through the implementation of balanced growth policies.

GDP and the Real Growth Rate of Manufacturing

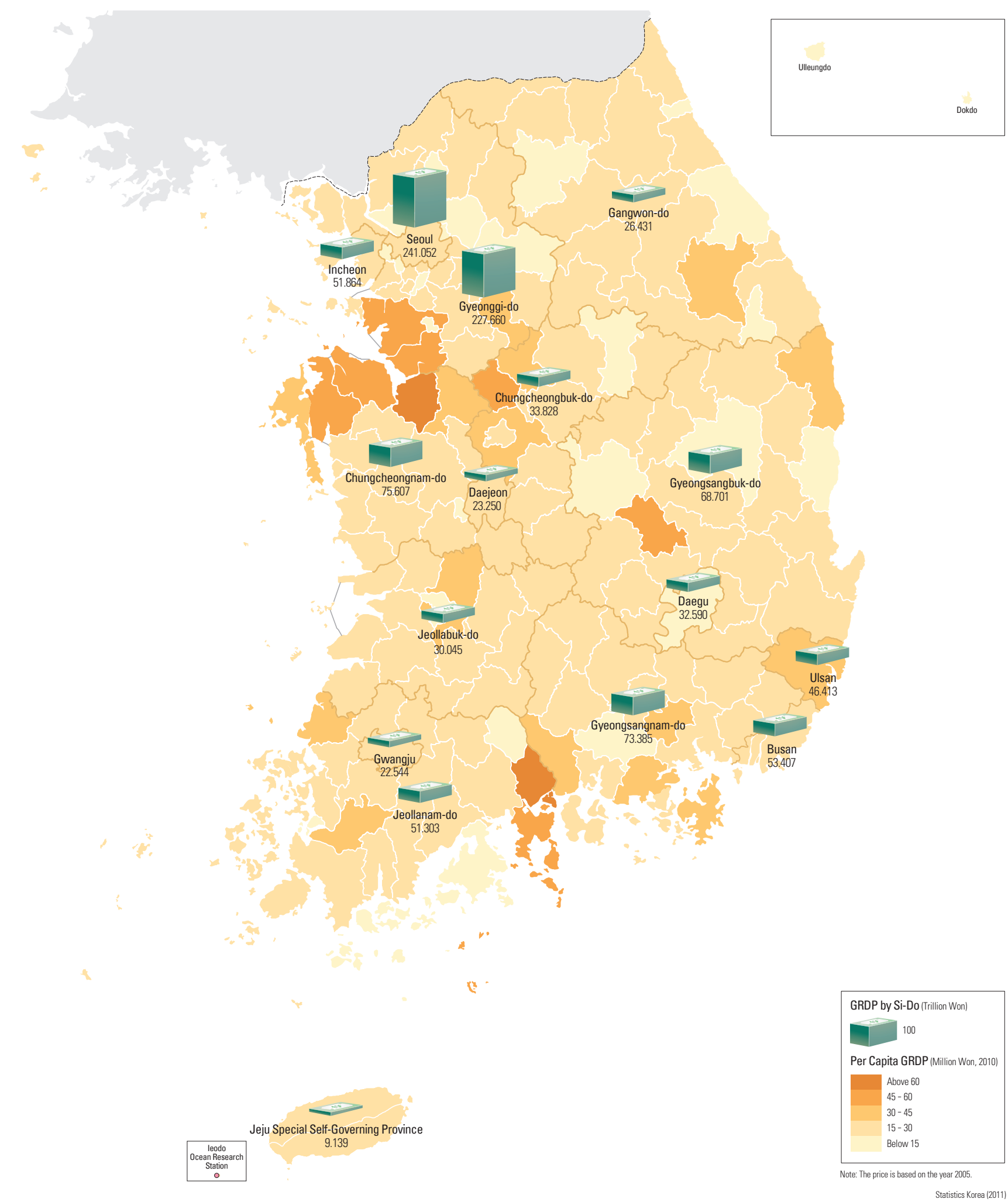


The Share of Value Added by Industry



Economic Growth

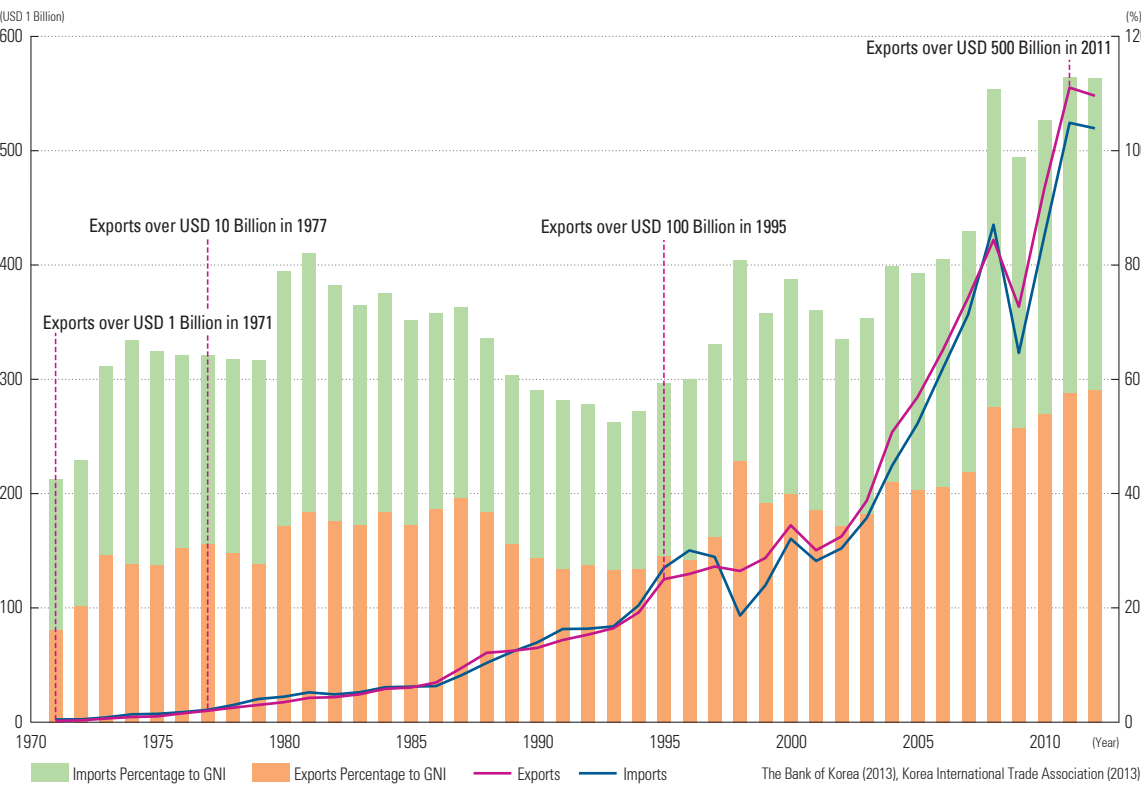
Gross Regional Domestic Product



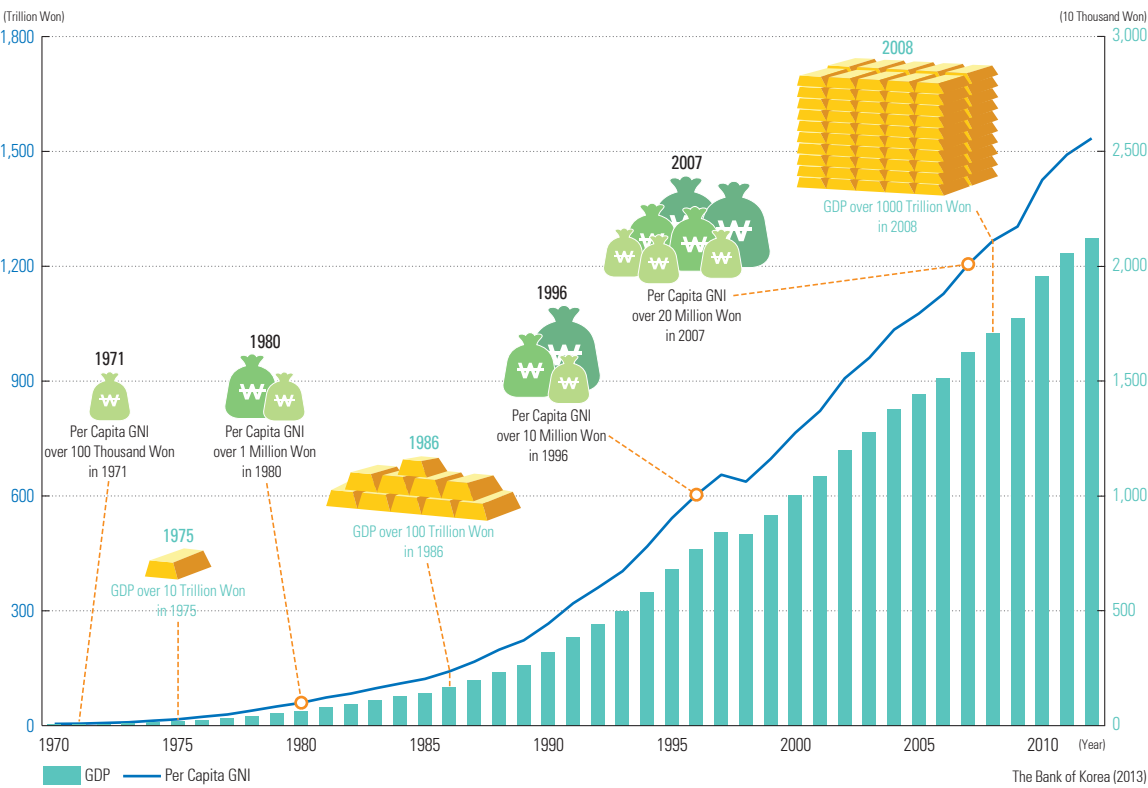
The Gross Regional Domestic Product (GRDP) and per capita Gross Regional Domestic Product are examples of regional economic indicators that gauge Korea's economic development and its current status. The GRDP indicates the total value of final products that were newly created within a certain region during a certain period. Through the GRDP, one can identify the size of the economy, the production level, and the industrial structure of each region, and when this measurement is applied to the national scale, it becomes the Gross Domestic Product (GDP). However, the assessment is not always consistent due to differences in the data and methods used at the time of estimation. The Gross National Income (GNI) indicates the income purchasing power, which is calculated by evaluating and adding the total amount of value added (based on market price) as created by all economic agents of a nation during a certain period, including households, firms, as well as the government. While the GDP is a production indicator used to measure production activities of a nation, the GNI is an income indicator used to measure the welfare level of the people of a nation.

The nominal GDP of Korea posted 1.1975 trillion USD in 2013, ranking it 15th in the world, and 12th in purchasing power parity. Korea's GDP was ranked 31st in 1960, 32nd in 1970, and 28th in 1980. With the rapid economic development in the 1980s, it climbed to 18th in 1985 and 15th in 1990. It has remained in the 11th-15th range since then. The increase of the GDP reached an excess of 10 trillion won in 1975, and it exceeded 100 trillion won in 1986, reflecting a tenfold growth within 11 years. In 2008, 33 years after it exceeded 10 trillion won, it exceeded 1,000 trillion won, which is 100 times over that of 1975, a vivid indicator of Korea's compressed economic growth by any measure. The shock of the 1997 Asian foreign exchange crisis reduced growth temporarily in 1998, but since then it has only continued to increase year after year. The per capita GNI was 100,000 won in 1971, but by 1980 it had jumped to 1 million won. By 1996, it exceeded 10 million won, and by 2007 the number exceeded 20 million won and stands above 25 million won as of 2013.

The Growth of Import and Export

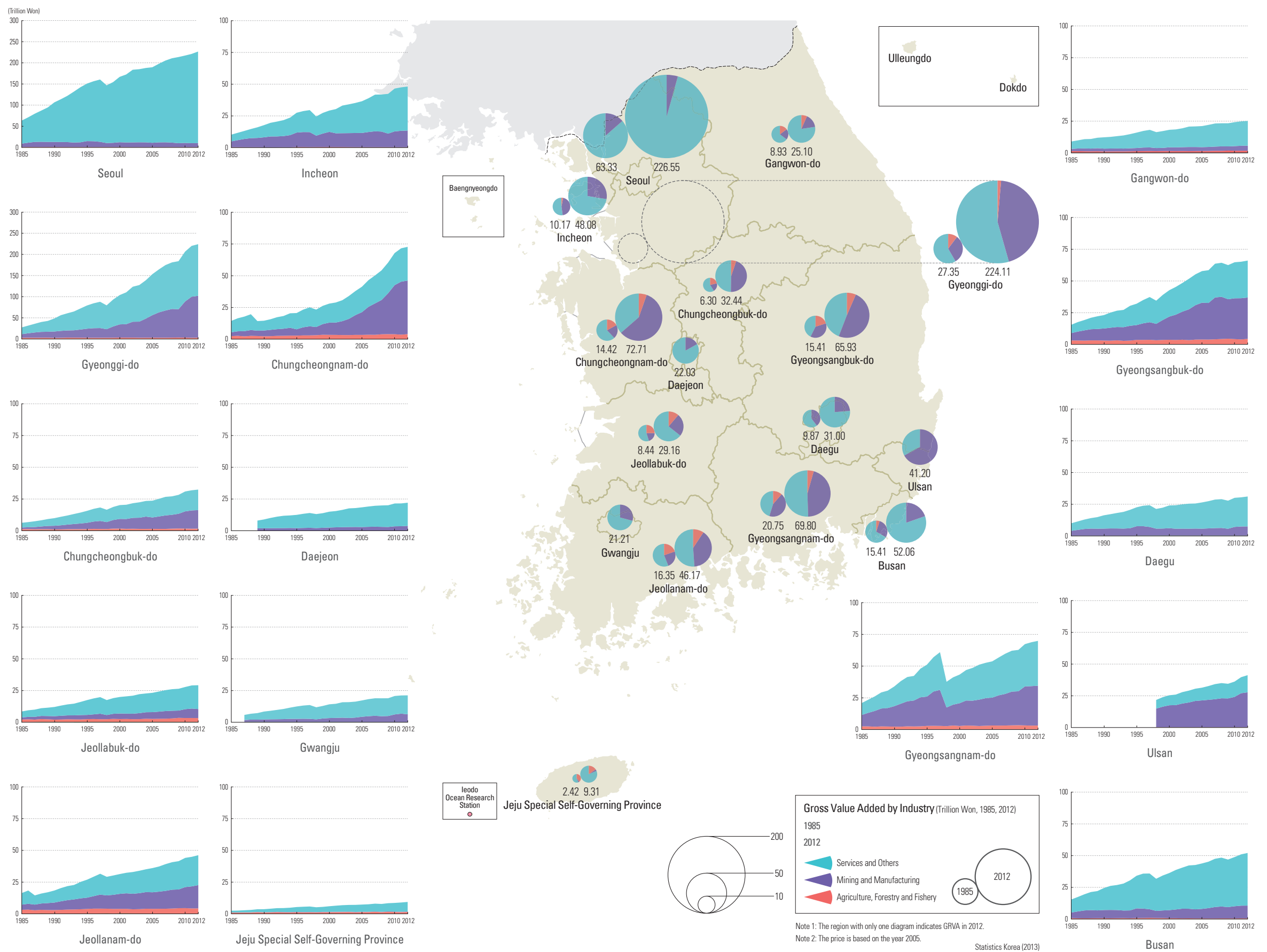


The Growth of GDP and per Capita GNI



Industrial Structure and Space

The Growth of Gross Regional Value Added by Industry



The change in industrial structure is usually assessed by reviewing changes in the share of agriculture, forestry, fishery, mining, manufacturing, service, and other industries. Many indicators can be used. However, the number of employees in each industry proves to be an excellent indicator. Since the 1960s, the agriculture, forestry, fishery, and mining industries in Korea have suffered a steady decrease in employment while manufacturing, service, and other industries increased. Similar patterns of decrease in agriculture along with a

concordant increase in manufacturing have also occurred in other countries, but what is unique about Korea's changing employment pattern is that it happened very rapidly. Even advanced countries went through such changes, but saw their transformation unfold over hundreds of years. Korea, on the other hand, underwent this dramatic shift in about 30 years. As such, Korea's industrialization can truly be characterized as rapid and compressed economic growth.

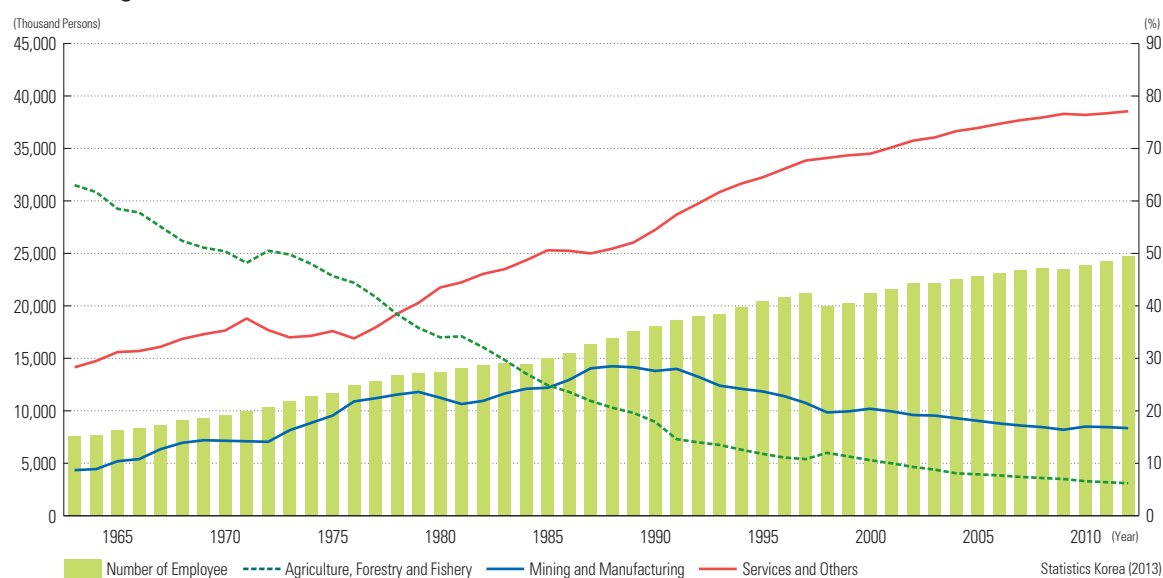
To examine the industrial structure of each city and

province between 1985 and 2012, one must review the changes in total value. In all regions, the total value added grew for 27 years. Rapid growth was seen especially in Gyeonggi-Do. In all regions, the agriculture, forestry, and fishery, share decreased, and metropolitan areas showed a decrease in manufacturing and an increase in service and other industries. Seoul saw a 95.5% in service and other industries, and Jeju saw an 81.3% in service and other industries of the total gross value added in the region, which demonstrates that the industrial structure is

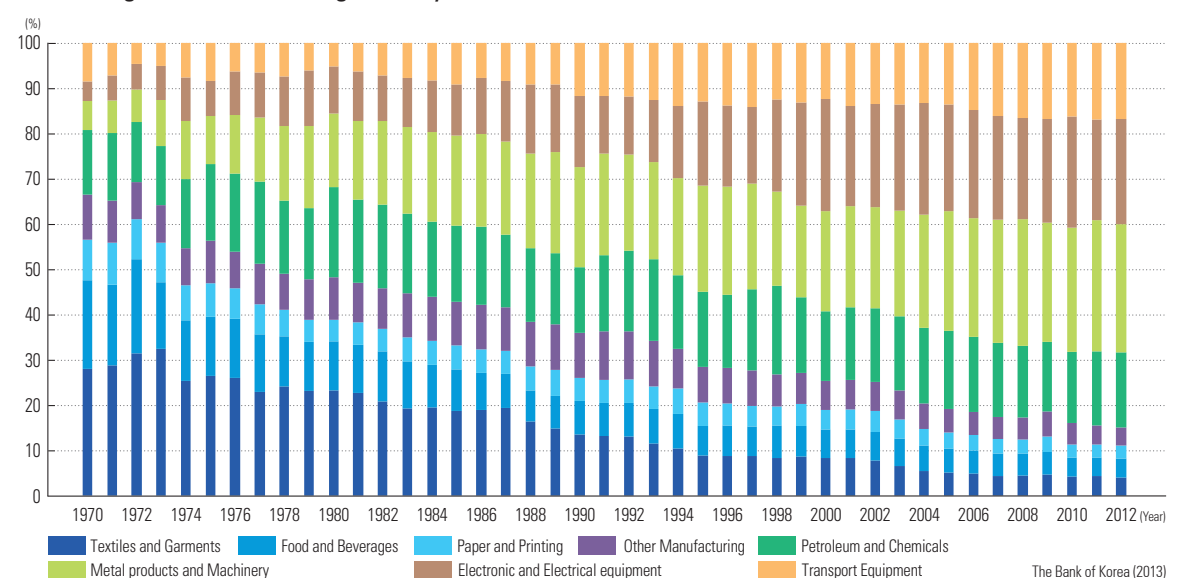
becoming service-oriented in these two regions.

Because the rapid economic growth of Korea was led by the manufacturing industry Korea's industrial growth overall has become synonymous with the manufacturing industry. In recent years, however, the focus of Korea's economy has shifted away from manufacturing towards high-technology-intensive industries.

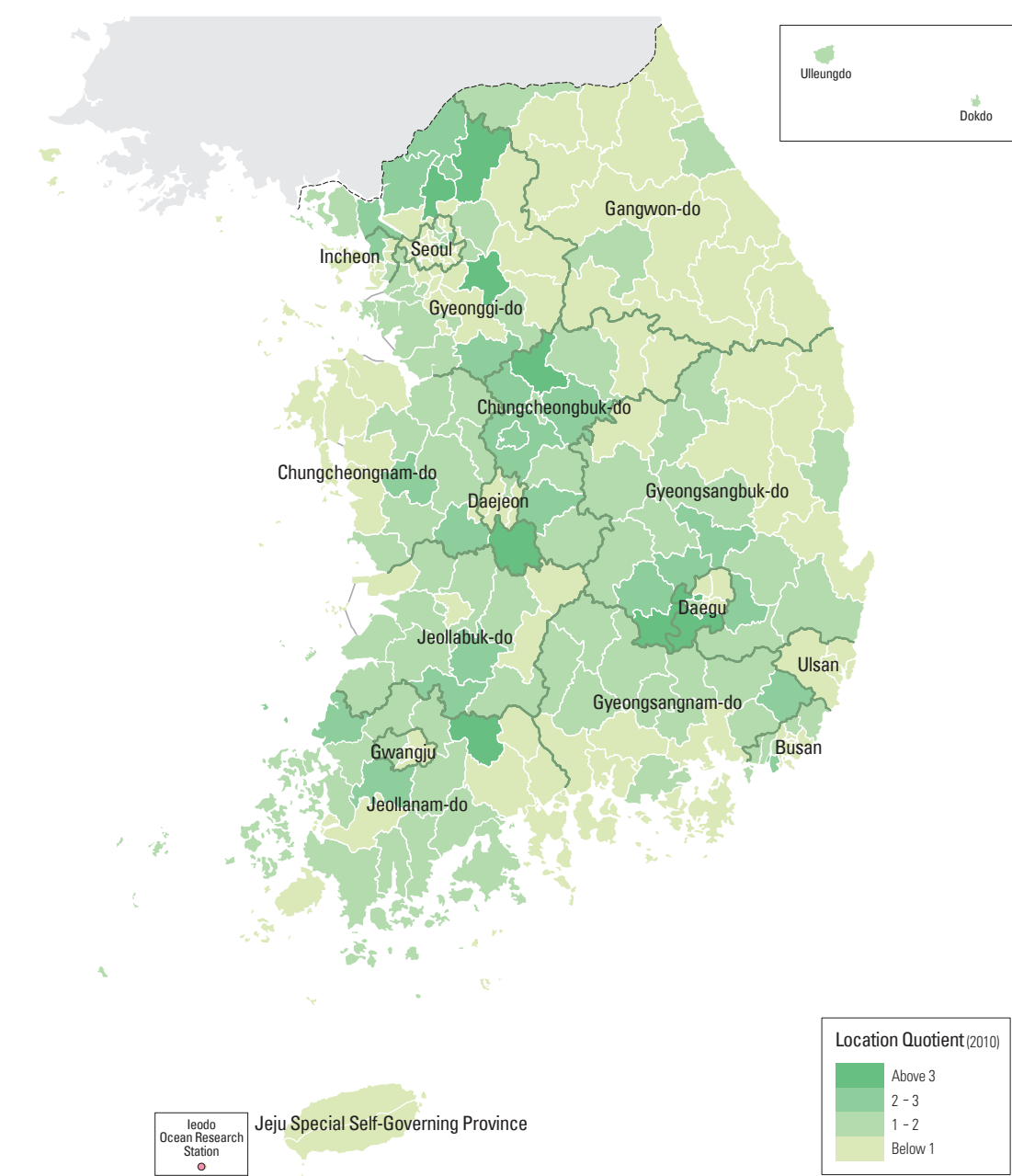
The Change of Industrial Structure



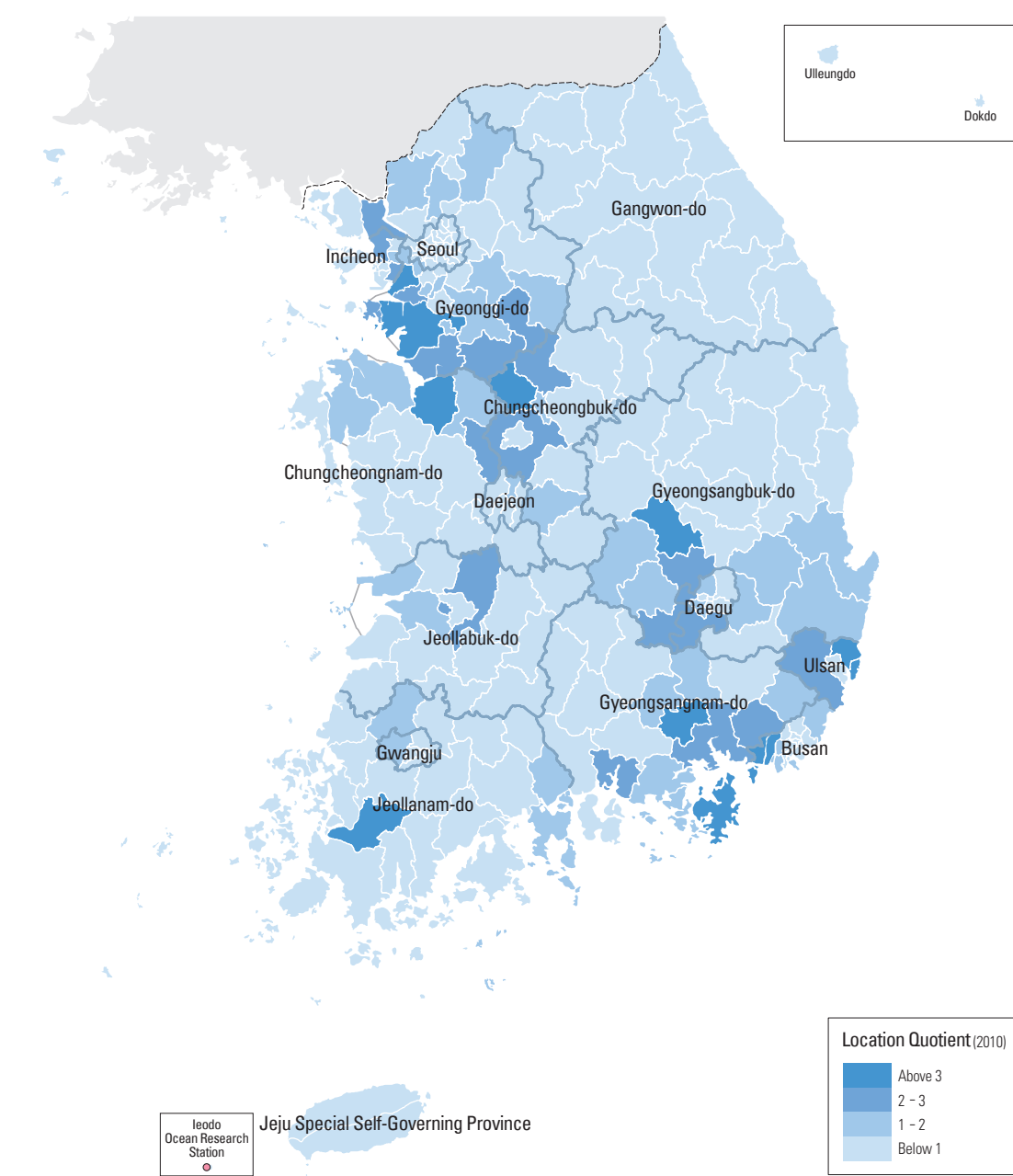
The Change of Manufacturing Industry Structure



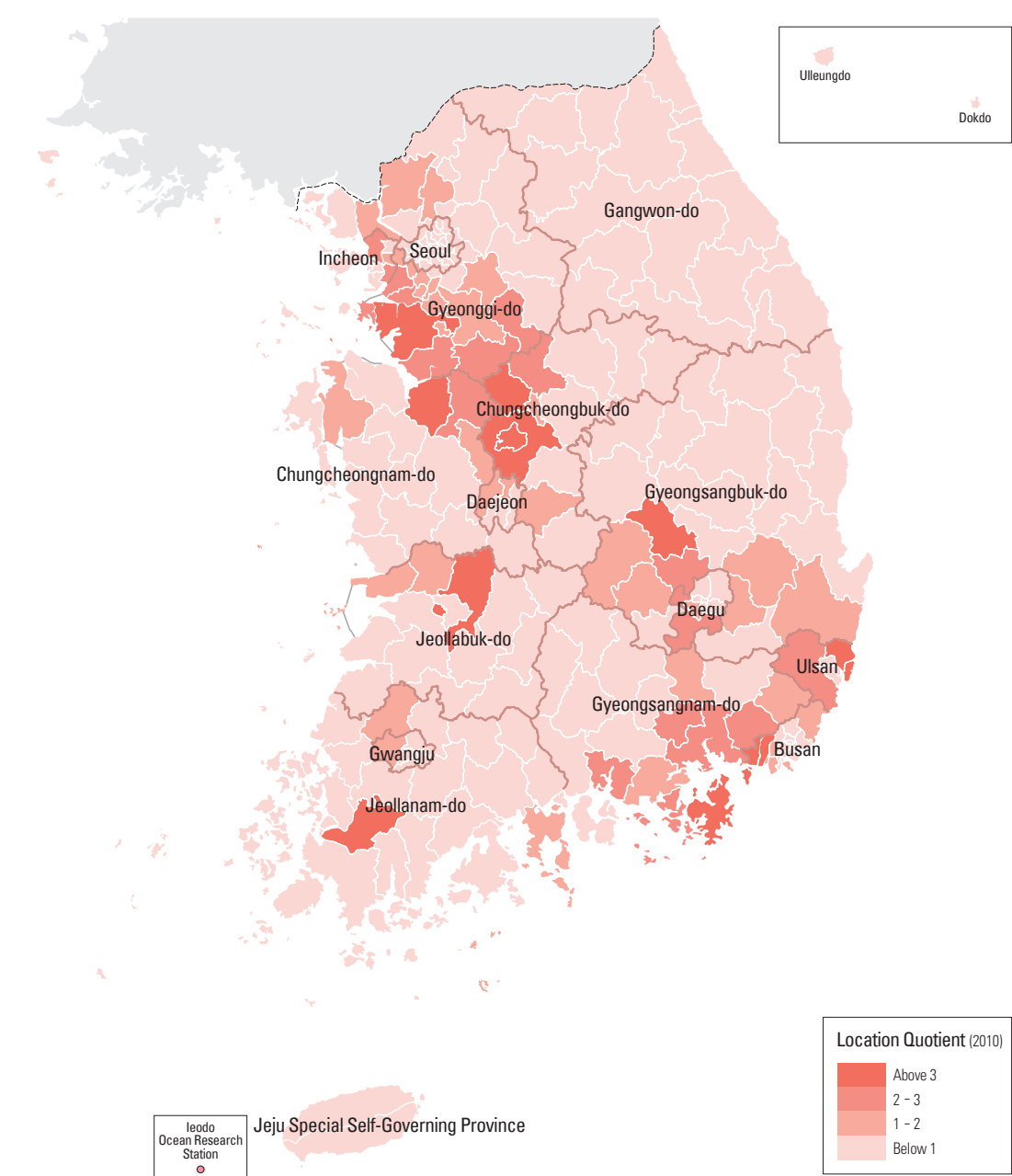
Light Industries



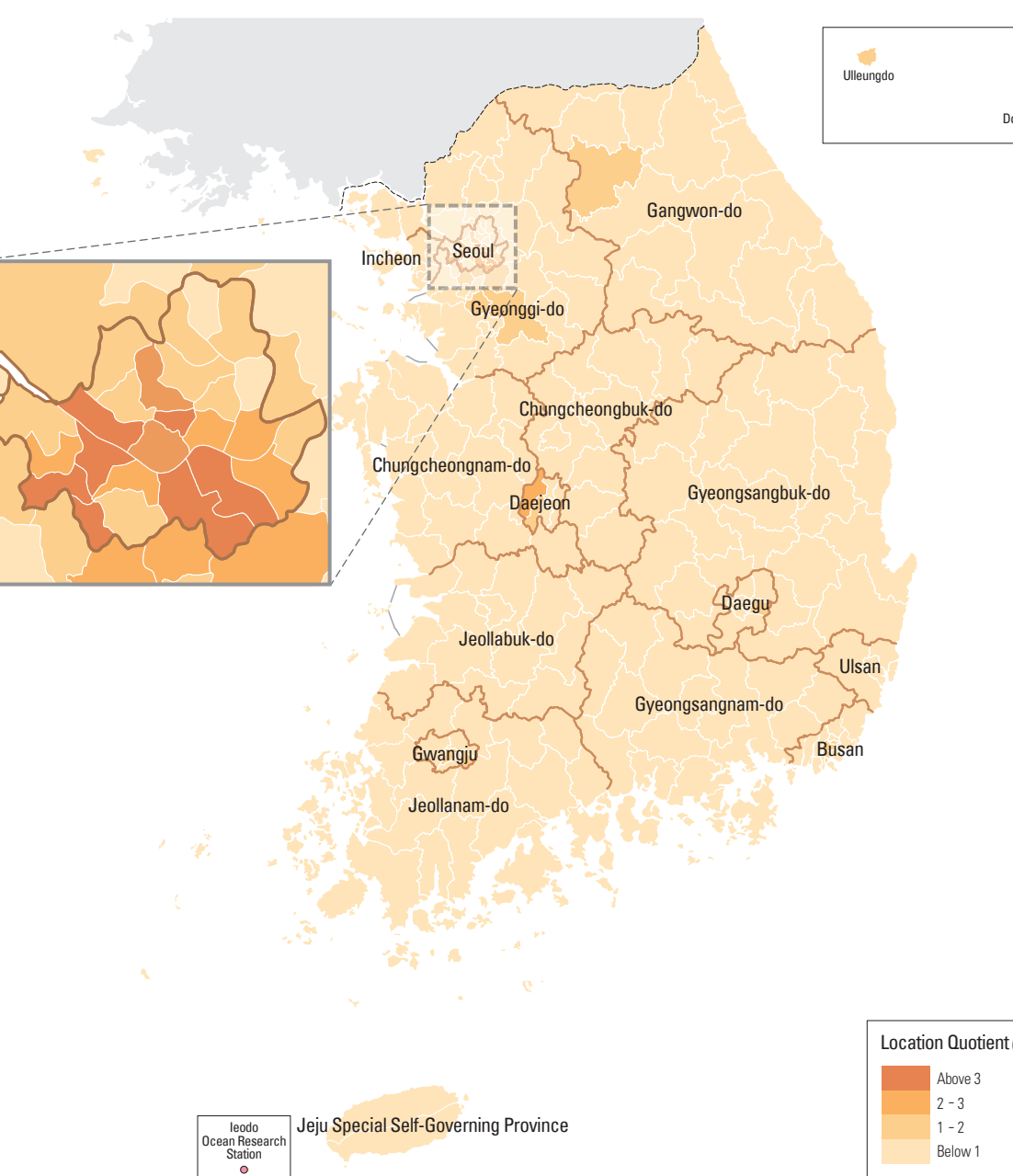
Heavy and Chemical Industries



High-tech Industries



Knowledge Intensive Services



Statistics Korea (2011)

The Location Quotient is an index that indicates how specialized a specific industry is within a certain region; it shows the number of people engaged in a certain industry

within a specific region divided by the number of people in that same industry in the entire country. Generally, when the location quotient is over one, then that specific industry

is specialized within that region. Spatially, industry is developed along the Gyeongbu Axis, and the heavy chemical and high-tech industries are concentrated on the

south side of the greater capital area and the southeastern coastal industrial area. Knowledge-intensive services are concentrated in the Gangnam area of Seoul.

Corporations and Innovation

Large firms in the export industry played a significant role in Korea's economic development. As development progressed, these firms became Korea's chaebols, or conglomerates. Korea's economy is highly dependent on large firms, and they have become increasingly important since 2000. The top 100 companies account for about 50% of the total billing amount of shipment, and the top 50 companies account for 43% of that number. Of the top 1,000 listed companies based on sales volume, 712 are located in Seoul metropolitan area including 529

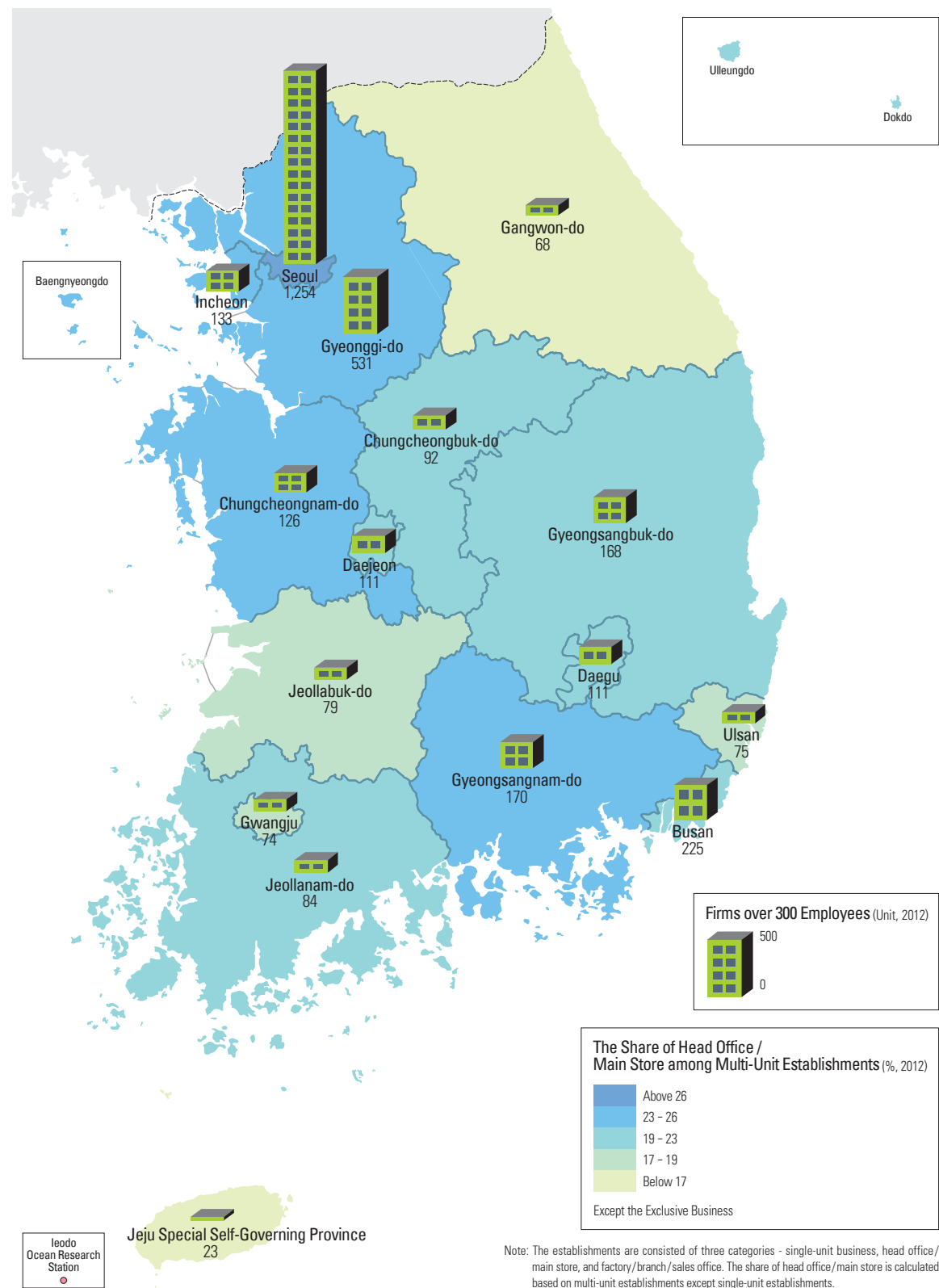
in the city of Seoul and 288 outside of the area. Most large firms have their headquarters in Seoul, and of these over 70% are located in the greater capital area, which indicates that many administrative and control functions are concentrated in the capital area.

Korea's early approach to manufacturing industries focused on component-led light industries until the early 1970s, but after the mid-1970s, it shifted its emphasis toward investment-led heavy chemical industries. After the 1980s, it shifted again toward a focus on innovation-

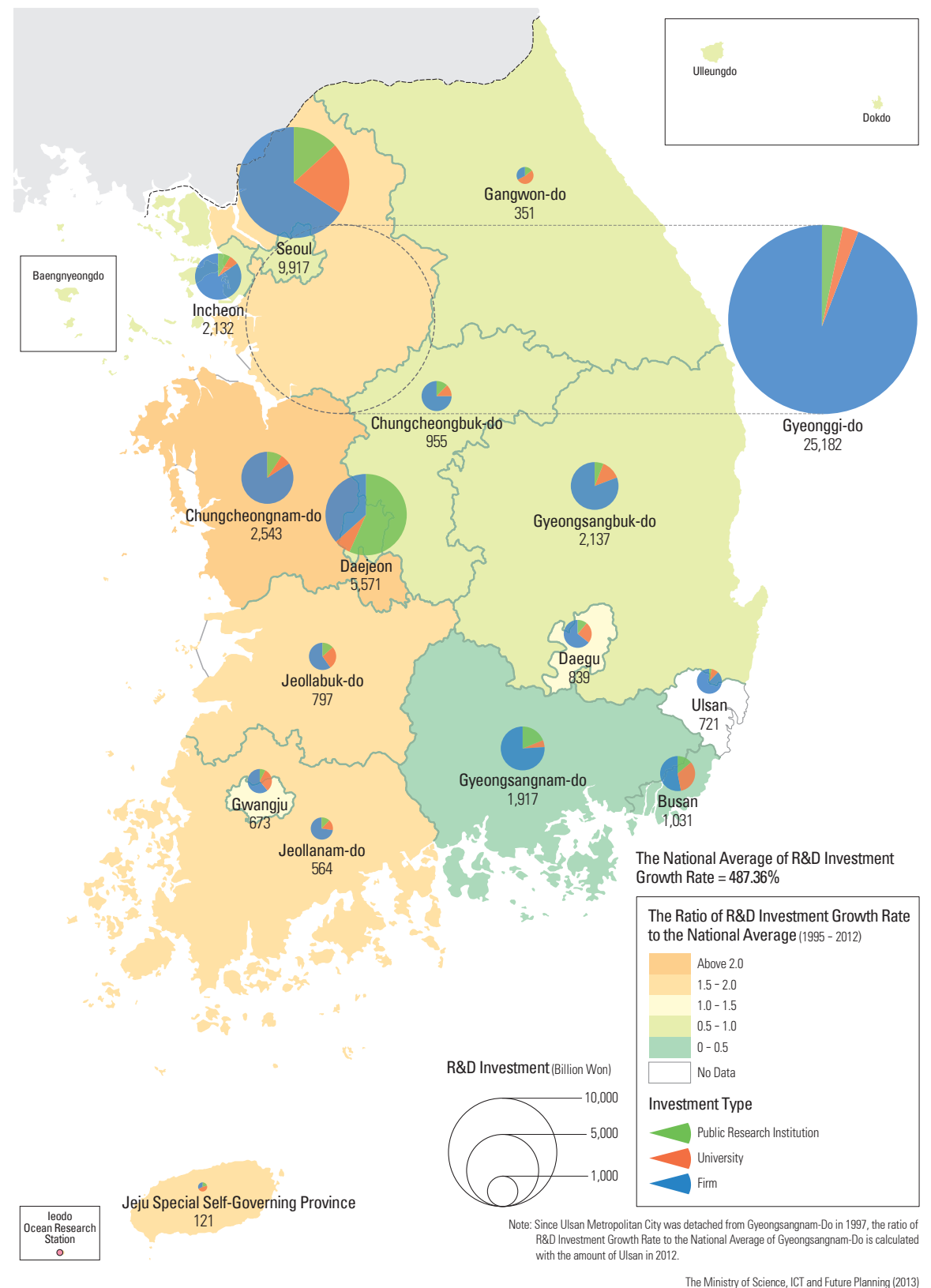
led industry by fostering highly skilled human resources and the development of technology. Research and development investment in Korea has increased from less than 1% of the GDP in the early 1980s to above 4% in 2011. This represents much faster growth in the technology sector than in other countries. The investment bodies of research and development changed as well. By the 1970s public research institutes accounted for more than half of the research and development in Korea, but the share of private sector investments rapidly

increased to make up more than 70% since the 1980s. The regional breakdown of investment in research and development reveals that Gyeonggi-do makes up 45.4% of the total, Seoul receives 17.9% of the funding, and Incheon receives 3.8%, which means that capital area accounts for more than 67% of the spending on research and development. Additionally, a large number of major research institutes are concentrated in Daejeon.

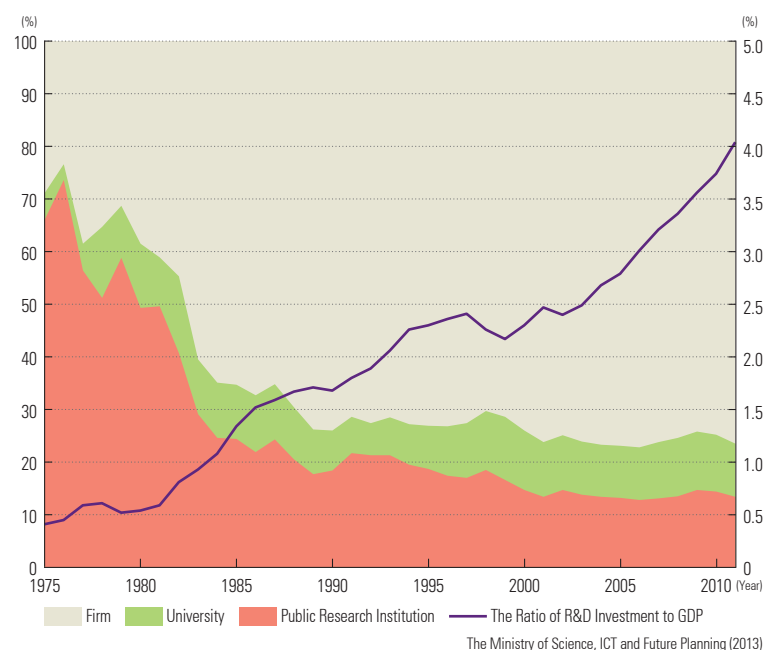
The Distribution of Firms by Business and Scale



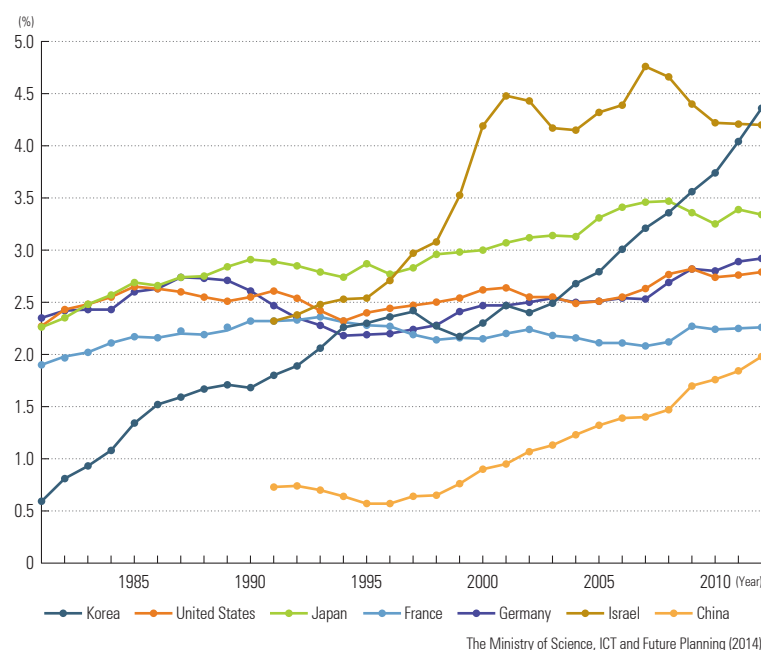
R&D Investment



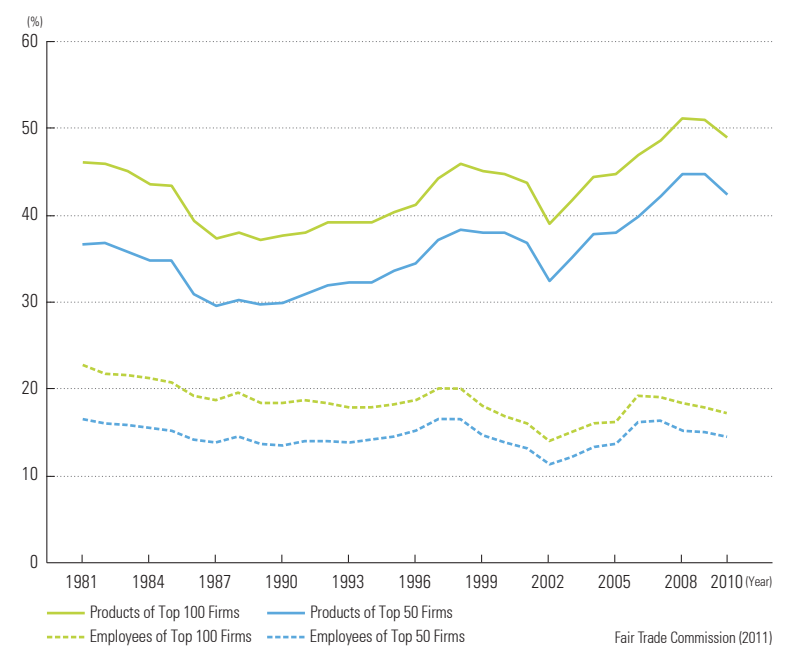
The Share of R&D Amount by Investor



The R&D Investment Rate in the World

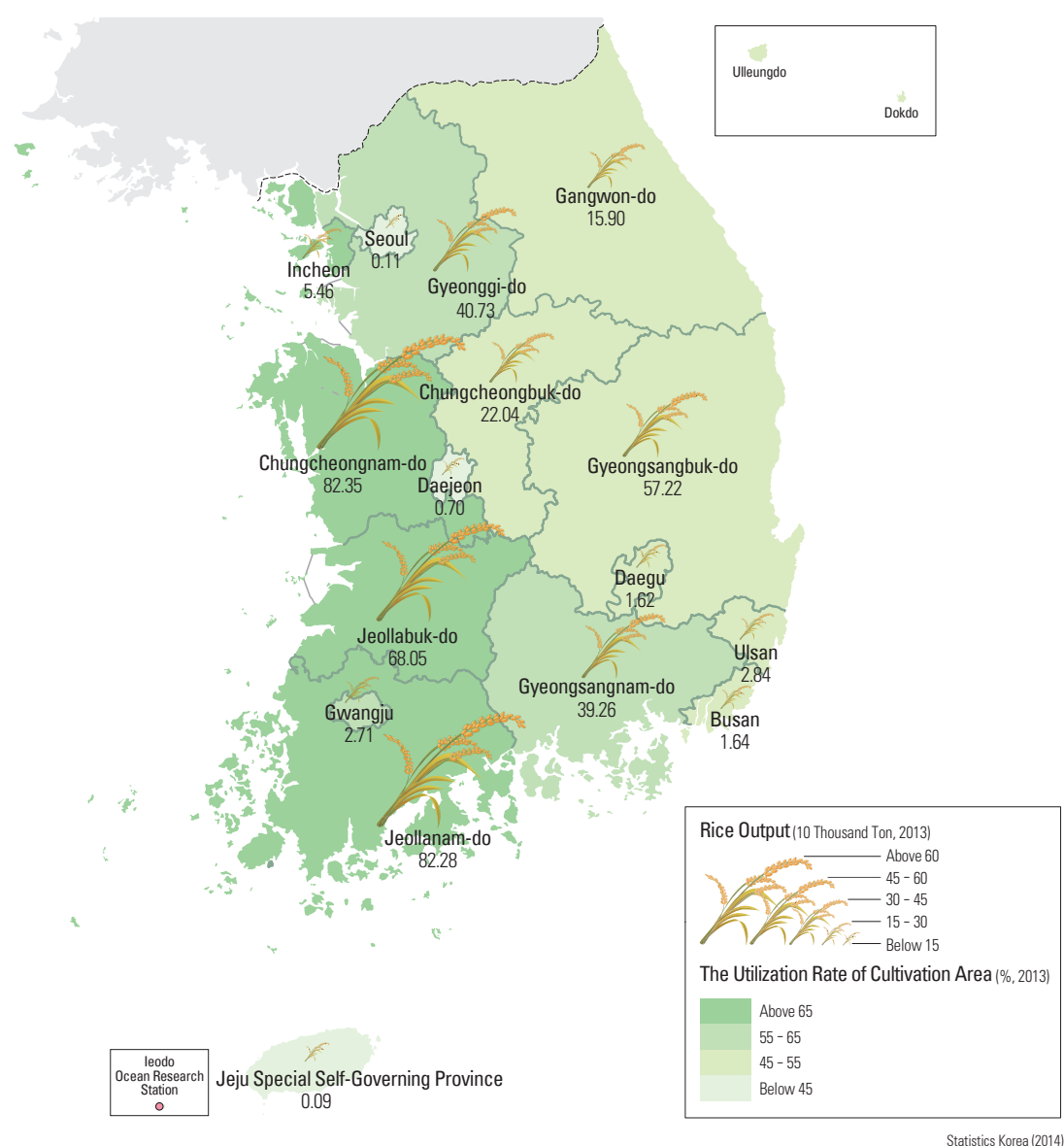


The Share of Top 100 Firms



Resources and Energy

Agricultural Production

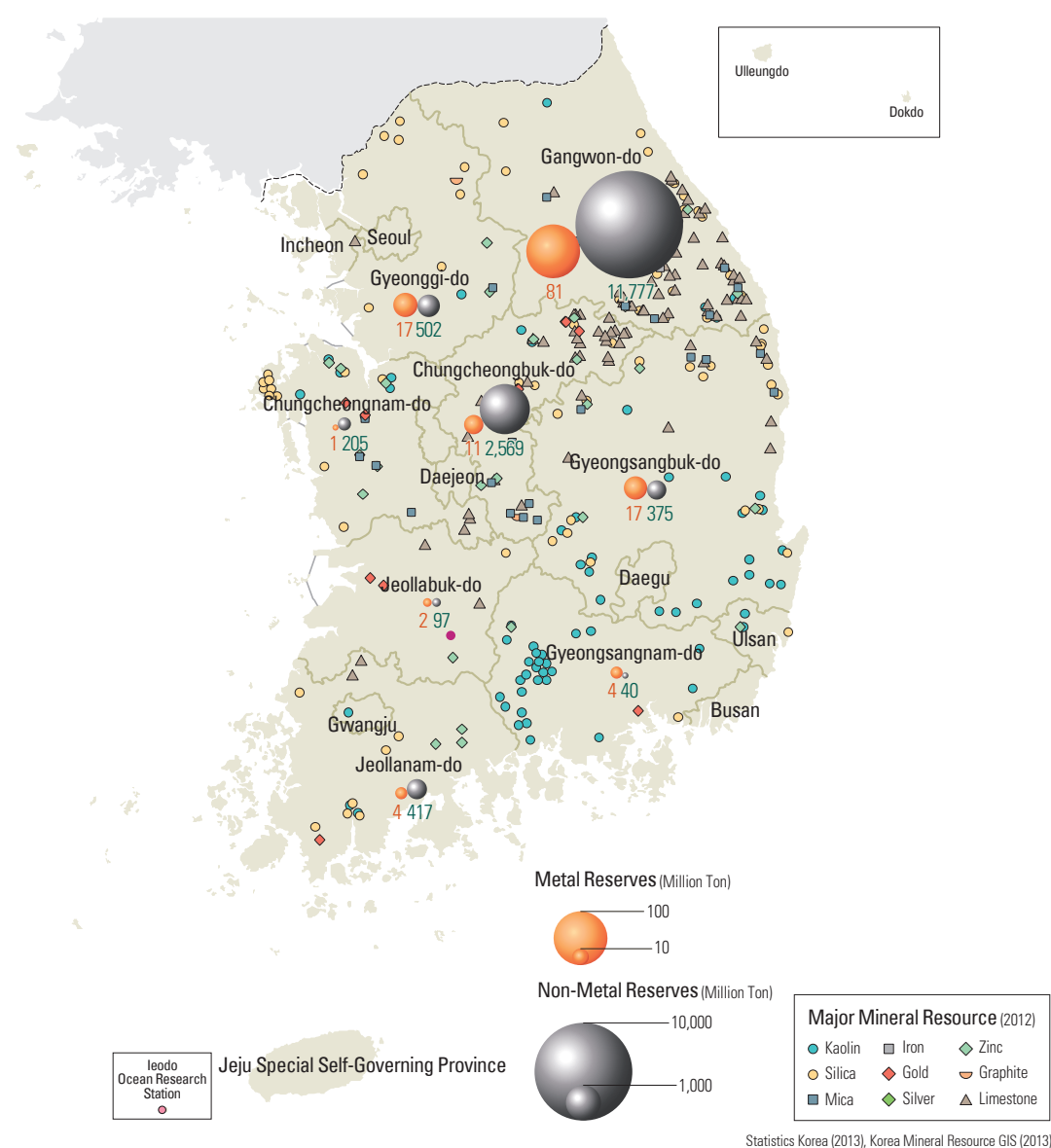


Korea's agricultural production can be reviewed by examining the gross agricultural output. The ratio of crops to livestock was 9:1 in the early 1950s, but the share of livestock increased to 7:3 by 2010. Rice represented more than 50% of the shares of agricultural products in 1950s, but its share gradually decreased to less than 30% by 2010. On the other hand, the share of vegetables and fruits continues to grow. Rice production still affects the overall agricultural industry significantly; its production is high in Jeollabuk-do, Jeollanam-do, and Chungcheongnam-do. The total area of the landmass in cultivation continues

to shrink and this decline is common to all crops.

There are about 300 minerals found in Korea and about 140 of these are of commercial value. Currently, only 20 minerals are mined, and only a few of these minerals are abundant. Out of metal minerals iron, manganese, tungsten, molybdenum, and zinc can be found in the Taebaeksan mineral zone (Samcheok-si, Taebaek-si, and Yangyang-gun of Gangwon-do) and copper is also present in the Taebaeksan mineral zone and in Gyeongsangbuk-do and Gyeongsangnam-do. Gold and silver can be found nationwide; however, the reserve is small.

Mineral Resources

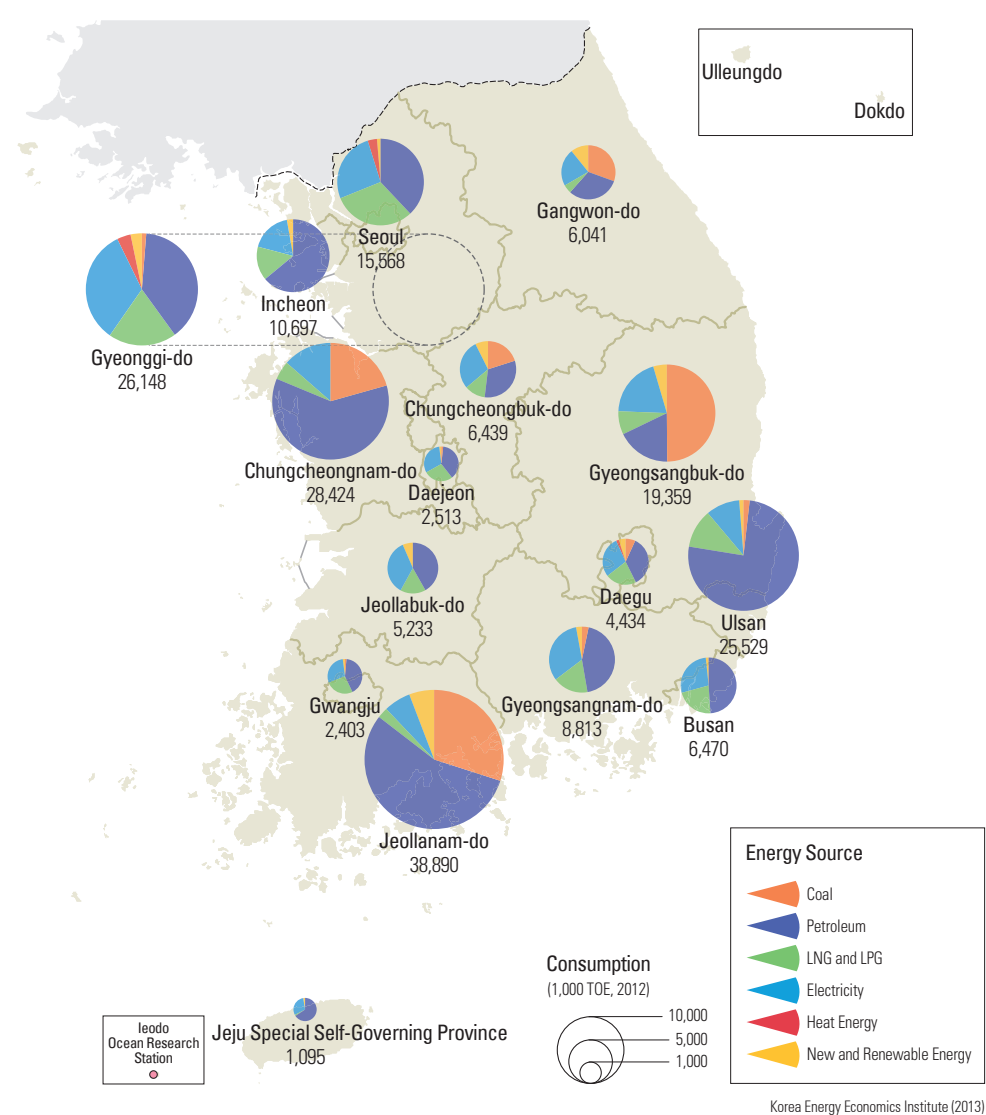


Limestone is mined in Gangwon-do, Chungcheongbuk-do, Gyeongsangbuk-do, and Jeollanam-do, and the extracted amount has increased and parallels the growth of the cement industry. Limestone and silica exist in abundance in Korea such that the domestic demands can be met. Anthracite, also called hard coal, is found in Gangwon-do, Chungcheongbuk-do, Chungcheongnam-do, Jeollabuk-do, Jeollanam-do, and Gyeonggi-do, but more than half the national reserve is in Tanjeon, near Taebaeksanmaek.

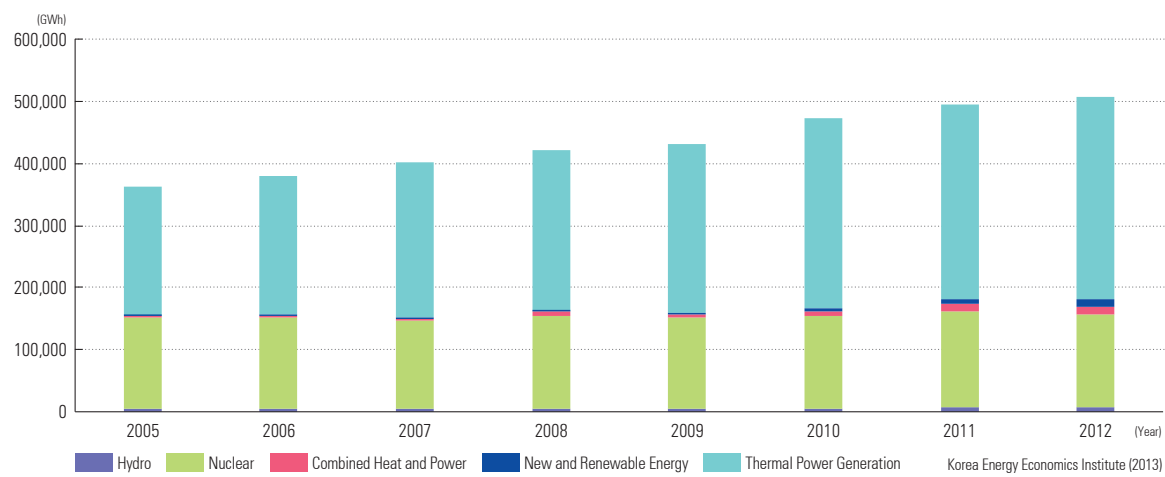
Energy resources used in daily life include petroleum,

coal, and gas (non-renewable energy) as well as renewable energy such as solar, water, and wind power. Coal and hydroelectric power are generated domestically, but only in small amounts. More than 95% of the nation's energy is imported. Out of the nation's entire import volume, energy makes up about a quarter, and petroleum accounts for a large share of imported energy. At the present the most heavily consumed forms of energy are petroleum, coal, nuclear energy, and natural gas in that order.

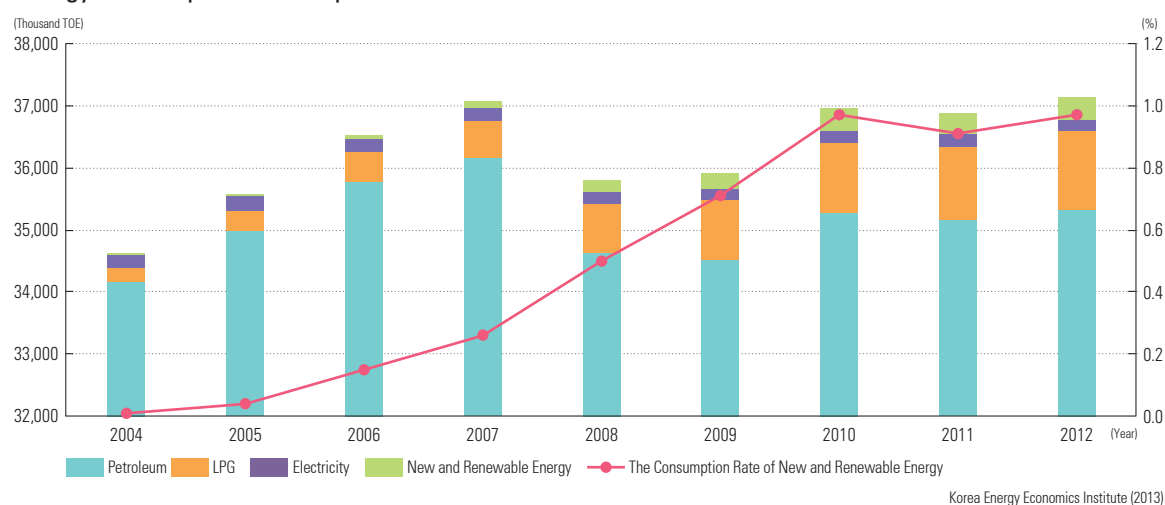
Final Energy Consumption by Source



Electricity Generation by Source



Energy Consumption in Transportation



The Transformation of Economic Activities

National economic activities can be reviewed through the characteristics of employment and consumption. First, employment can be reviewed by examining the employment rate, the unemployment rate, and the employment structure. Labor force participation rate is the share of the economically active population (both employed and unemployed) as a percentage of the population group older than 15 years of age. It is the most typical indicator to evaluate a nation's active economic activity. The employment rate is the share of the employed as a percentage of the entire population group older than 15 years of age, and the unemployment rate indicates the share of the unemployed as a percentage of the economically active population. The unemployment rate does not include those who gave up

on employment after trying to get a job for a long time; thus, it can be underestimated. In this context, the OECD recommends that the unemployment rate be used along with the employment rate for evaluating the economy. The employment rate is lower in metropolitan areas even though there are a lot of jobs, but this is due to the high urban population that skews the statistic. On the other hand, the unemployment rate is high in urban areas due to the high number of job seekers compared to the size of the urban population. In non-urban areas, even though the share of the non-economically active population is high, unemployed adults are either not interested in working or are not active job seekers; thus, they are not counted in the statistics.

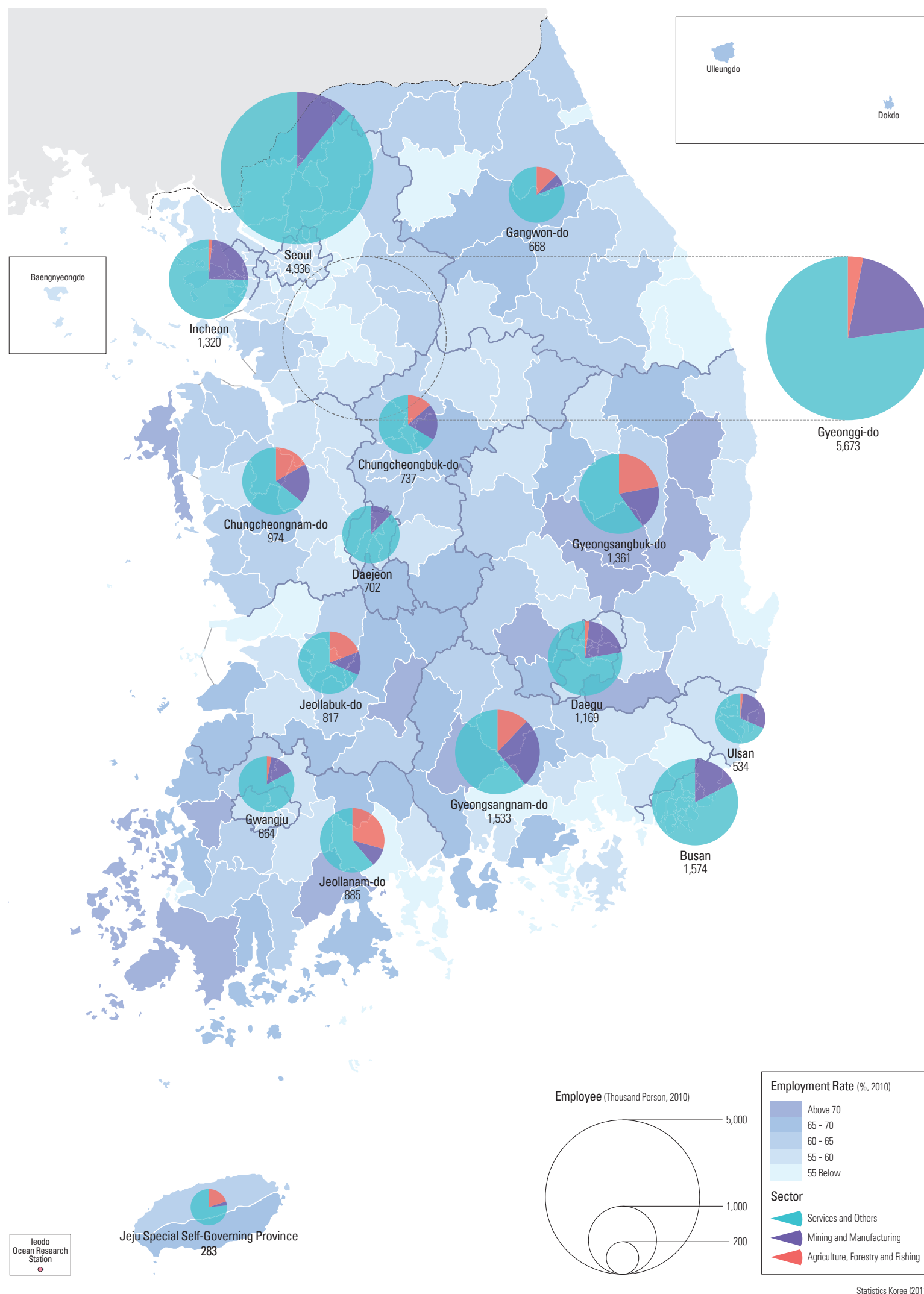
The Consumer Price Index, which is one of several

consumption indicators, measures the average price fluctuation of products and services purchased by households to meet daily needs. It is calculated by comparing a standard base point that is based on prices in the year 2010 as a quotient of 100. In other words, it provides the average measurement of inflation of overall household consumption as one of the macroeconomic indices. For instance, if the Consumer Price Index in 2010 was 100, it would have been 11.0 in 1975, 34.2 in 1985, 60.2 in 1995, and 86.1 in 2005 taking inflation into account through the years.

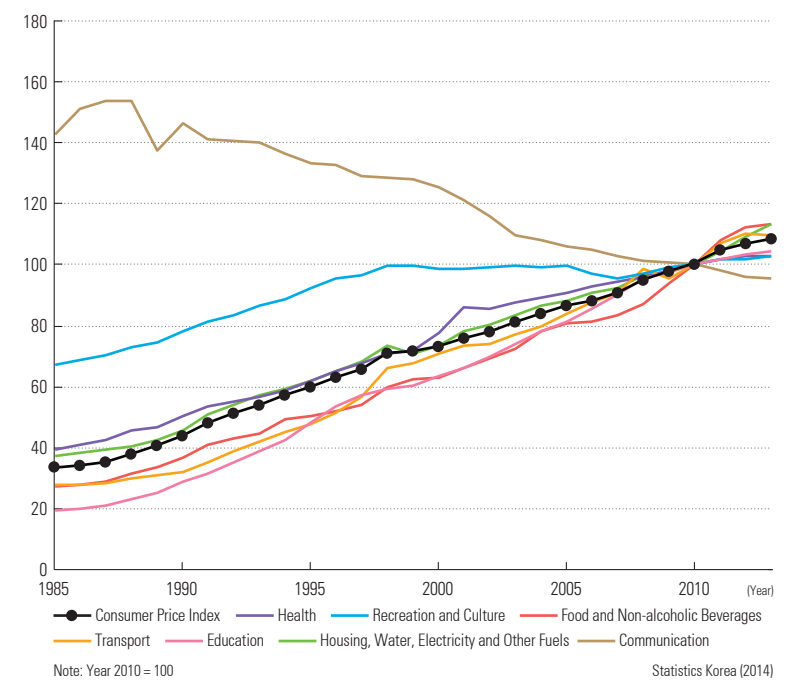
There were a number of crises during Korea's transformation into an economically stable world power, and they deeply affected national economic activities. The two oil crises in the early and late 1970s, the decrease

in competitiveness due to labor disputes and wage increases in the late 1980s, the Asian foreign exchange crisis in late 1990s, and the global financial crisis of the late 2000s all had profound effects on Korea's economy. During the 1997 Asian foreign exchange crisis, Korea's economic growth rate, the GDP, import/export ratios, the foreign reserve and other economic indicators were particularly damaged while the exchange rate and interest rates soared. This led to a lower employment rate, higher unemployment rate, which cast a shadow over the national economy. Fortunately, due to intensive restructuring in both private and public sectors, the economy recovered relatively quickly and it has started to show growth once again.

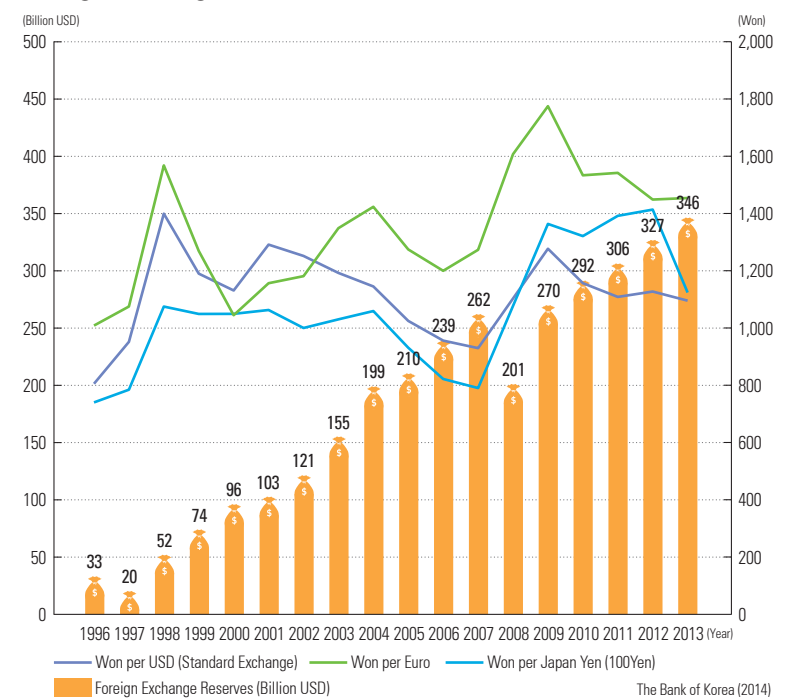
The Share of Employees by Industry and the Employment Rate



The Change of Consumer Price Index



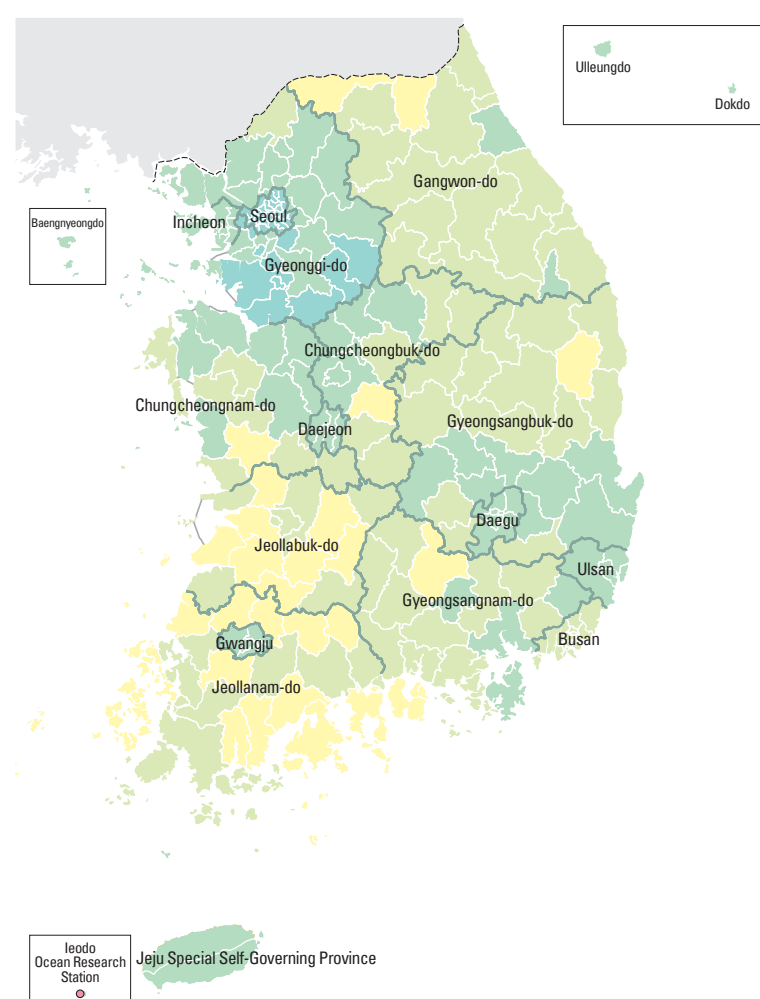
Foreign Exchange Rate and Reserves



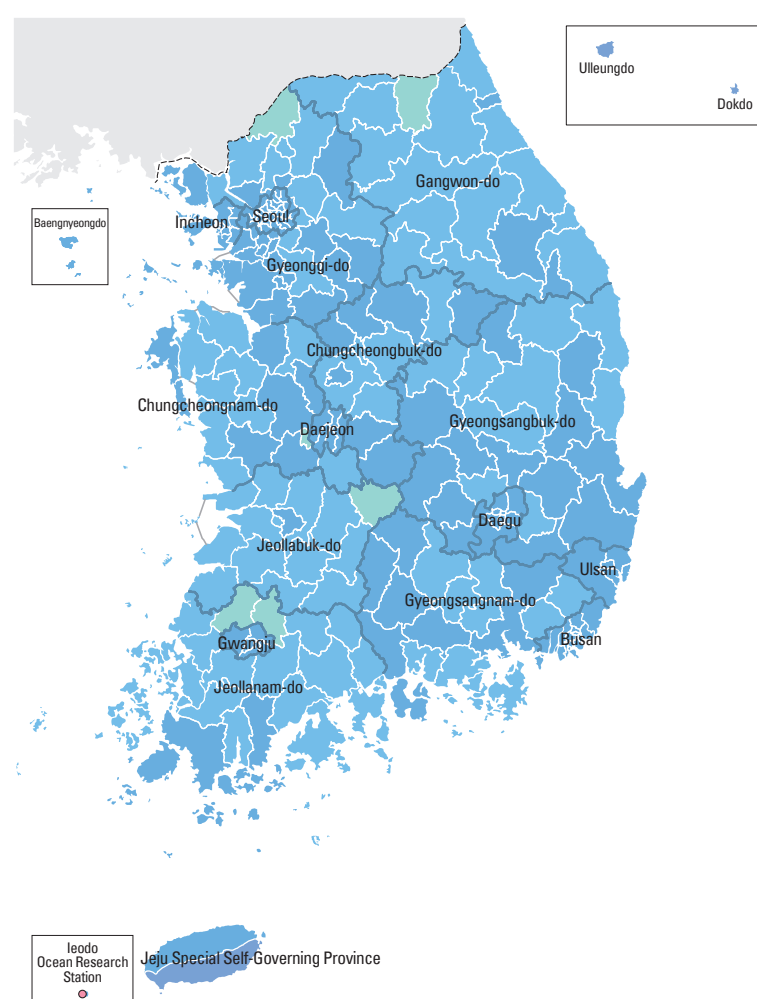
The Change of Interest Rates



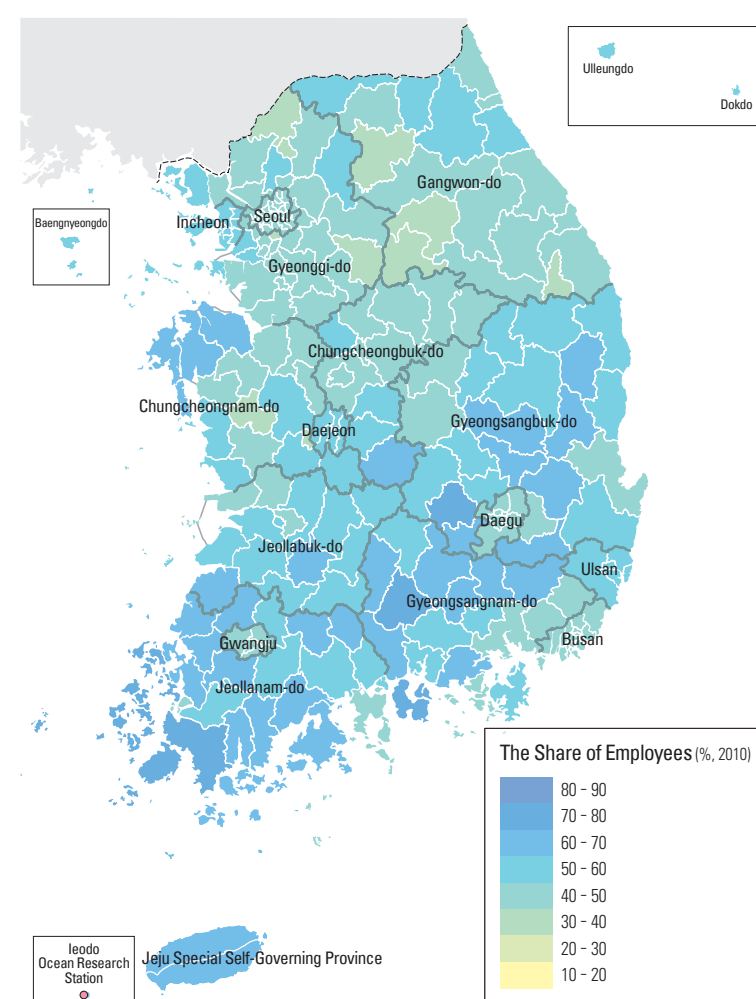
The Share of Employees of 15~29 Years Old



The Share of Employees of 30~49 Years Old



The Share of Employees of over 50 Years Old



Statistics Korea (2011)

The Korean labor market has undergone significant changes in the last six decades. In the 1960s, a non-skilled labor force was abundant, and it led to the development of labor-intensive industries. The unemployment rate decreased and employment increased. After the 1970s, as heavy chemical industries were developed there was an increased demand for skilled labor. And after the late 1980s, with the subsequent shift toward high value-added industries, such as information and communication, the demand for skilled labor has continued to increase. In addition, the wage gap increased in direct relation to educational accomplishments, work experience, and professional competence.

The change in the employment rate demonstrates a progression from the lower 50% range in the early 1960s to nearly 60% in 2013. The male employment rate remained steady in the 70-75% range, but the female employment rate increased from the mid-30% range to nearly 50% more recently, indicating more participation from the female work force. The female work force made significant contributions in the 1960s and 1970s with the development of labor-intensive industries. As the number of female high school and university graduates increased, women's economic participation rate continued to grow. Today, the percentage of women participating in the national workforce is still lower than in other

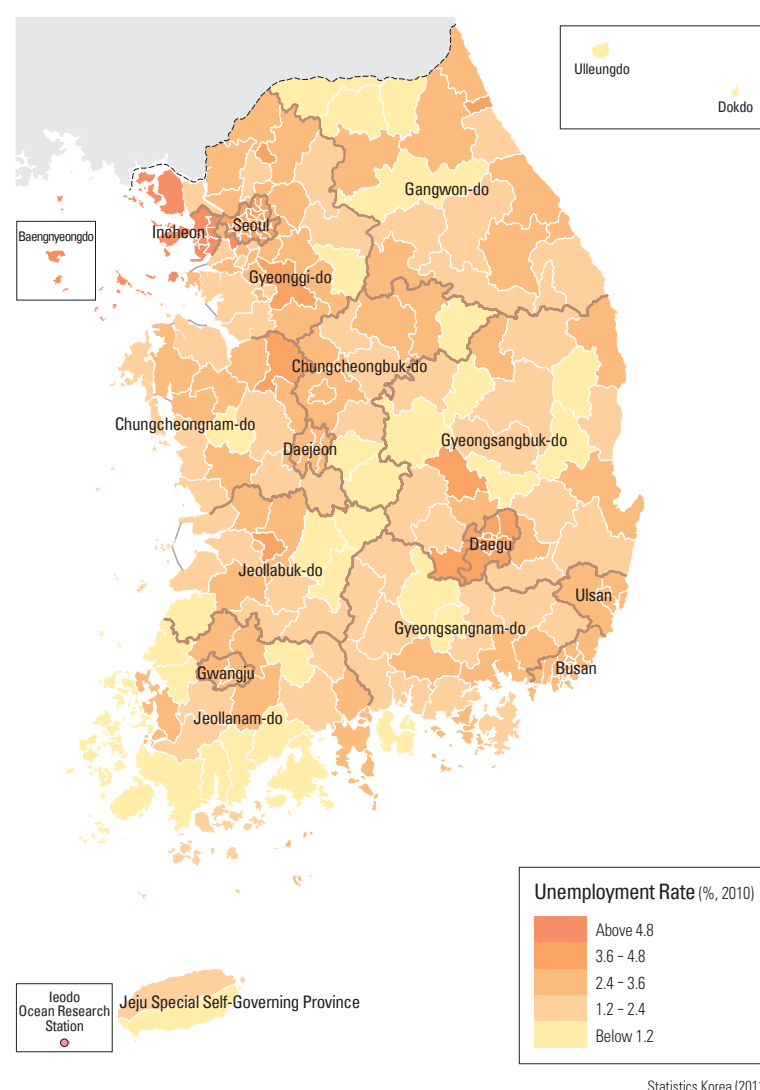
OECD countries, which indicates there is a need to implement new policies that would facilitate more female participation in the labor force such as increasing access to childcare facilities, and reducing in average weekly work hours.

Korea's population is rapidly aging, a shift which is causing serious social issues such as a breakdown in securing support for the elderly and age-based income inequity. The number of young job seekers who are not reflected in unemployment rate statistics is also on the rise. The population of the elderly who are not supported by their children is also increasing, making elder employment issues more serious. The monthly salary of

workers over 60 years old was higher than average until the early 1990. However, this has changed since 2000, and now male workers over the age of 60 make only 80% of the average salary of their male peers under the age of 60. For their female counterparts in the same age group, women's salaries are on a downward trend from the mid-50% range.

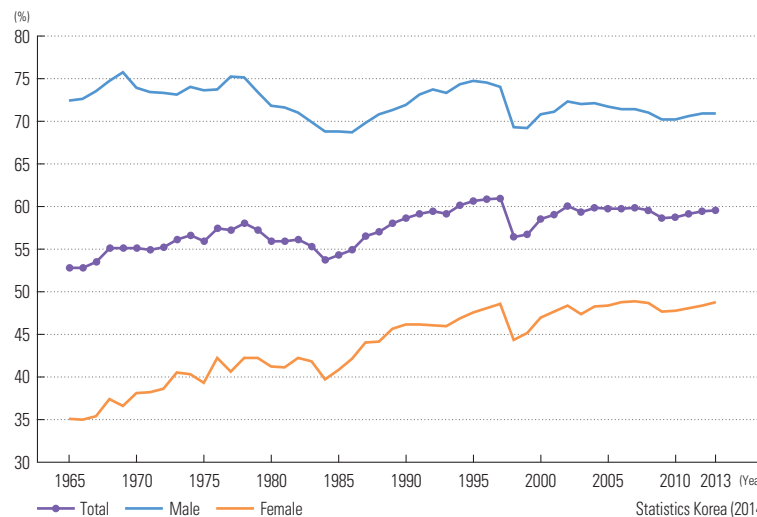
The share of university graduates is higher in metropolitan areas than in other regions, and with the overall education level in the nation rising, more focus is now being given to those unemployed citizens who have higher education training.

Unemployment Rate

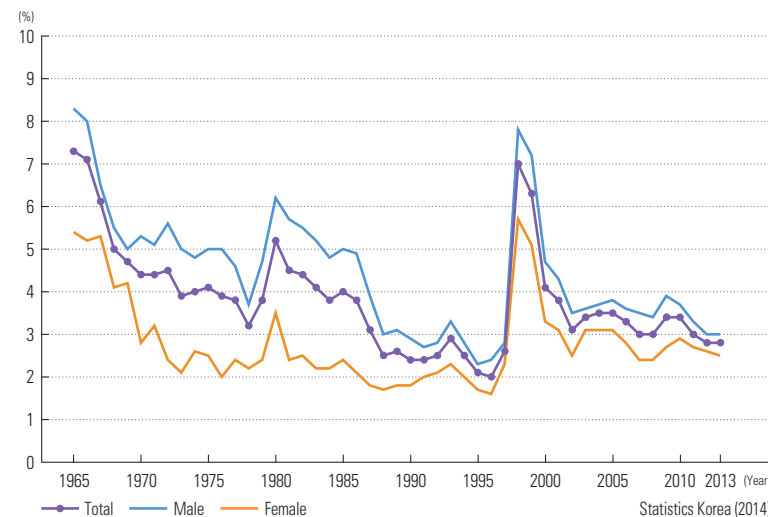


Statistics Korea (2011)

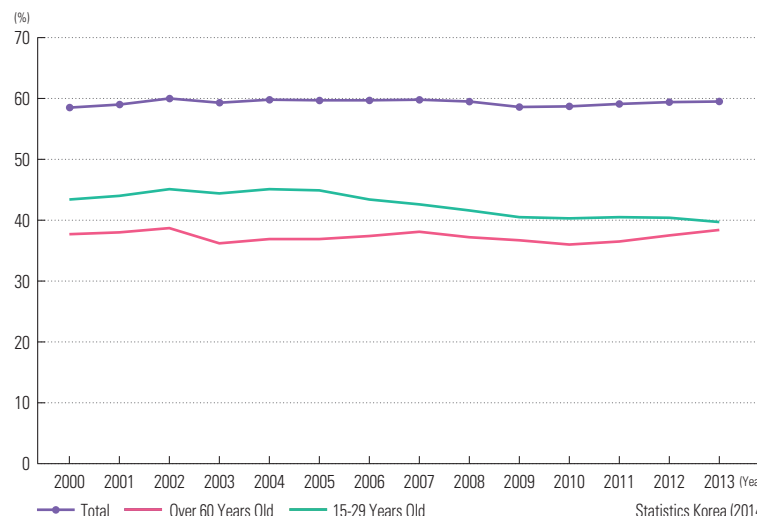
The Change of Employment Rate by Gender



The Change of Unemployment Rate by Gender



The Change of Employment Rate by Age



The Change of Unemployment Rate by Age



Quality of Life

During the early phases of post-war development in Korea, the focus was primarily upon rebuilding the nation's infrastructure and establishing a solid industrial base, a prioritizing that helped the country rise from the devastation of colonization and war but did little to assist with key issues of quality of life beyond elemental issues of survival. Korea has come so far in such a short time it is finally entering an age in which the government is able to create programs dedicated to improving quality of life. The happiness of the Korean populace is now an explicitly stated goal of Korean development policy. While happiness is common value, the forms it may take in individual lives vary widely, and this understanding presents challenges to those charged with the task of

measuring quality of life. The economic-based objective, index-oriented evaluation of happiness has been replaced by an evaluation that includes social and subjective indices as well. Among policy makers, achieving majority consensus on defining this index has been difficult. At the present time a variety of research results on measuring happiness are reported by central and local governments, the academic community, and the business community. Economic and objective indices when compared with social, subjective indices reveal major differences in that the former uses one single measurement (monetary value) and its utility when evaluating an individual's happiness is limited. The latter, on the other hand, uses a flexible variety of measurements that can be interpreted

differently according to different contexts.

This difference does not simply mean that the criterion for the evaluation of happiness should be one single measurement or a mixture of multiple measurements, but rather it means that the interpretation of the level of happiness within a society should require multiple conceptual approaches that allow for philosophical and ideological differences. The concept Quality of Life (QoL) itself is under active scrutiny so that happiness levels are no longer defined solely through monetary indices, but through ever-broadening perspectives on just what happiness means thereby facilitating more precise measurements of the welfare of both individuals and the society-at-large.

The Committee on Quality of Life Enhancement in the Prime Minister's Office is an official organization that evaluates the quality of life in Korea on a year-to-year basis. Local governments also make efforts to evaluate the quality of life of their people and from these evaluations they derive policy implications. Many private organizations also define their own quality of life index according to their own focus and criteria, but they also try to evaluate the quality of life of both with local communities and the society at large.

Happiness Index (Life Satisfaction Level)



National Statistics of Quality of Life by Sector



| Year | HDI |
|------|-------|
| 2000 | 0.839 |
| 2001 | 0.875 |
| 2002 | 0.882 |
| 2003 | 0.890 |
| 2004 | 0.895 |
| 2005 | 0.898 |
| 2006 | 0.905 |
| 2007 | 0.907 |
| 2008 | 0.909 |
| 2009 | 0.907 |
| 2010 | 0.907 |
| 2011 | 0.907 |
| 2012 | 0.909 |
| 2013 | 0.909 |

UNDP (2013)

UNDP (2013)

| Year | Elderly (%) | Disabled (%) | Early Childhood (0-5 yr) (%) |
|------|-------------|--------------|------------------------------|
| 1990 | 0.6 | 0.2 | 0.1 |
| 1995 | 1.1 | 0.4 | 0.1 |
| 2000 | 1.3 | 0.4 | 0.1 |
| 2005 | 1.5 | 0.5 | 0.2 |
| 2009 | 2.1 | 0.6 | 0.7 |

Source: OECD (2009)

OECD (2009)

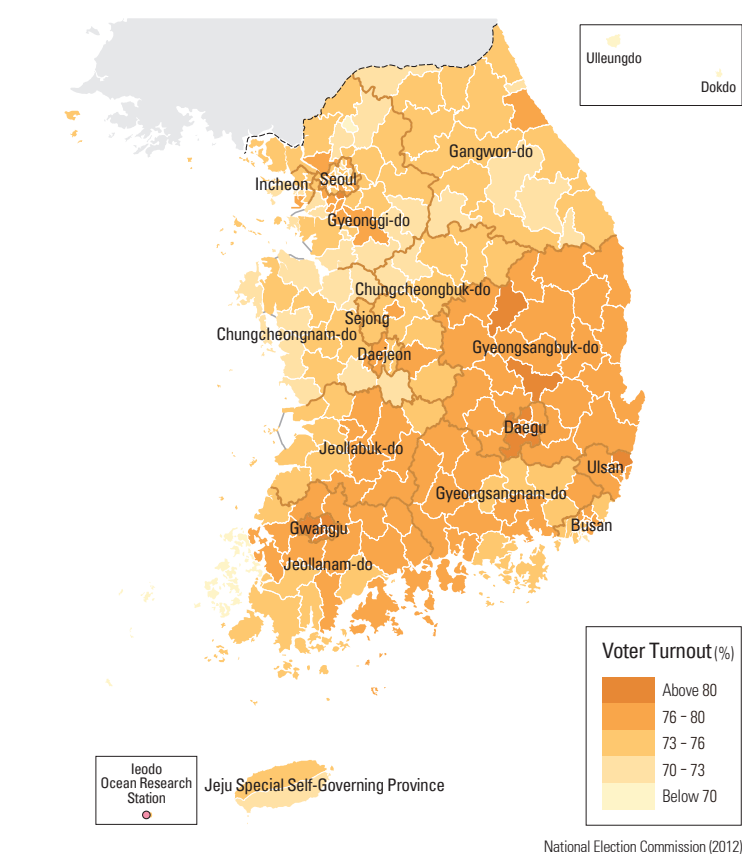
| Country | Men (Hours/Week) | Women (Hours/Week) |
|--------------------------|------------------|--------------------|
| Australia | 8.1 | 7.3 |
| Austria | 7.3 | 7.4 |
| Belgium | 7.4 | 7.9 |
| Canada | 7.9 | 4.8 |
| Chile | 4.8 | 6.1 |
| Czech Republic | 6.1 | 5.3 |
| Denmark | 5.3 | 7.6 |
| Estonia | 7.6 | 6.8 |
| Finland | 6.8 | 7.3 |
| France | 7.3 | 4.2 |
| Germany | 4.2 | 5.2 |
| Greece | 5.2 | 7.5 |
| Hungary | 7.5 | 5.9 |
| Iceland | 5.9 | 6.2 |
| Ireland | 6.2 | 6.3 |
| Israel | 6.3 | 3.7 |
| Italy | 3.7 | 7.6 |
| Japan | 7.6 | 5.5 |
| Korea | 5.5 | 7.2 |
| Luxembourg | 7.2 | 3.7 |
| Mexico | 3.7 | 7.6 |
| Netherlands | 7.6 | 7.5 |
| New Zealand | 7.5 | 8.0 |
| Norway | 8.0 | 5.5 |
| Poland | 5.5 | 5.2 |
| Portugal | 5.2 | 5.5 |
| Slovakia | 5.5 | 6.4 |
| Slovenia | 6.4 | 6.3 |
| Spain | 6.3 | 8.0 |
| Sweden | 8.0 | 7.9 |
| Switzerland | 7.9 | 3.3 |
| Turkey | 3.3 | 7.4 |
| United Kingdom | 7.4 | 7.6 |
| United States of America | 7.6 | 4.7 |
| Brazil | 4.7 | 4.3 |
| Russia | 4.3 | 4.3 |

OECD (2014)

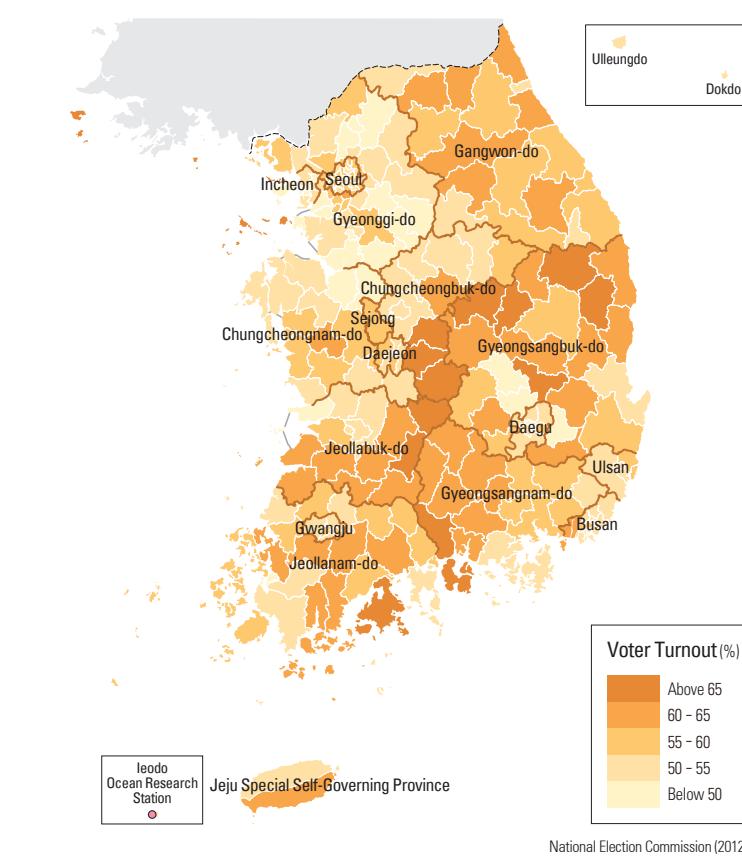
OECD (2014)

Public Participation

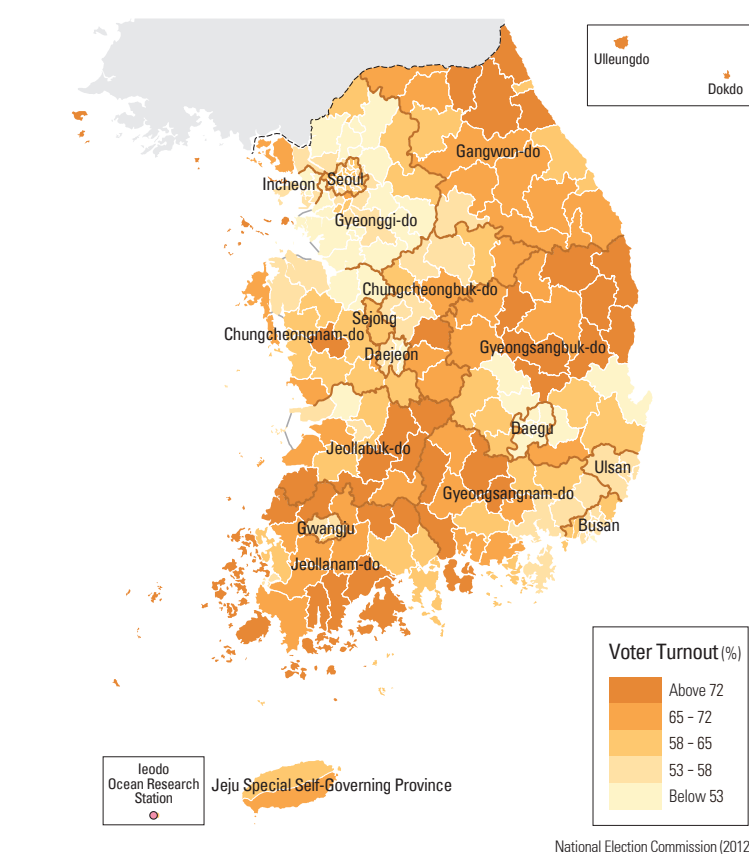
Voter Turnout in the 18th Presidential Election



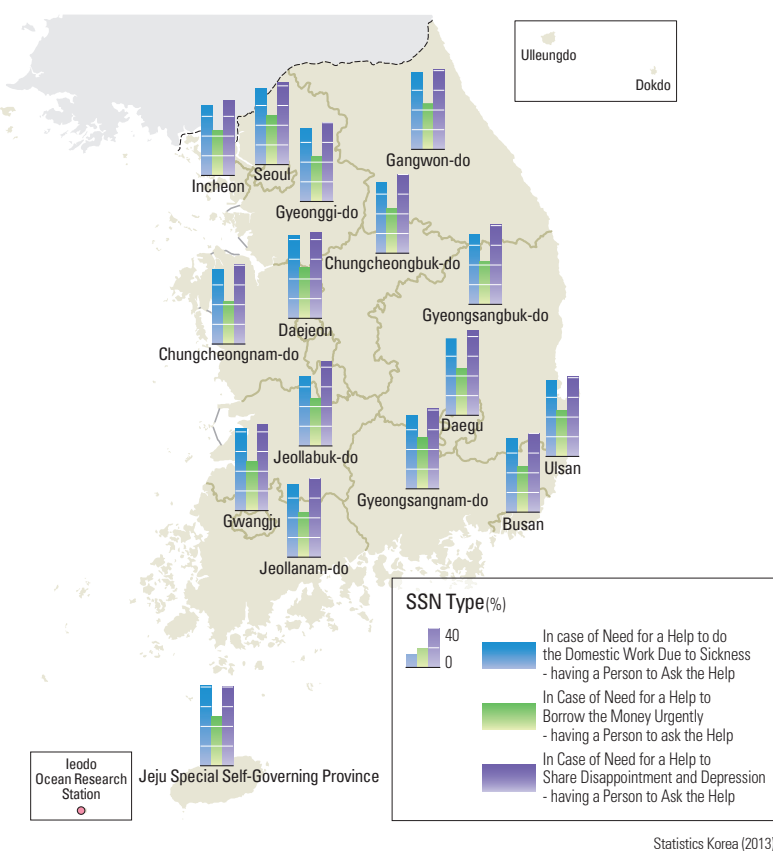
Voter Turnout in the 19th General Election



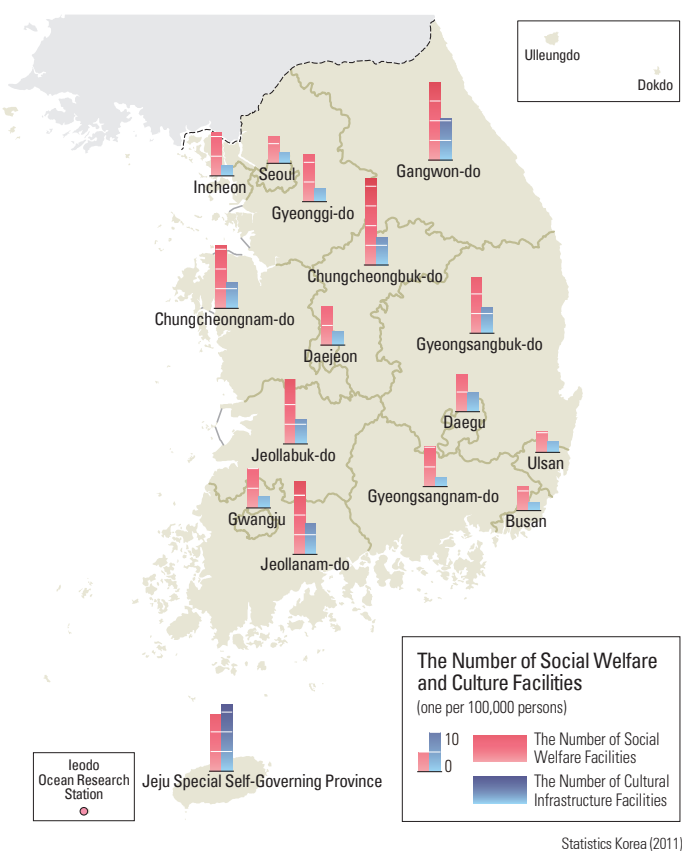
Voter Turnout in the 6th Local Election



Social Support Network



Social Welfare and Culture Facilities



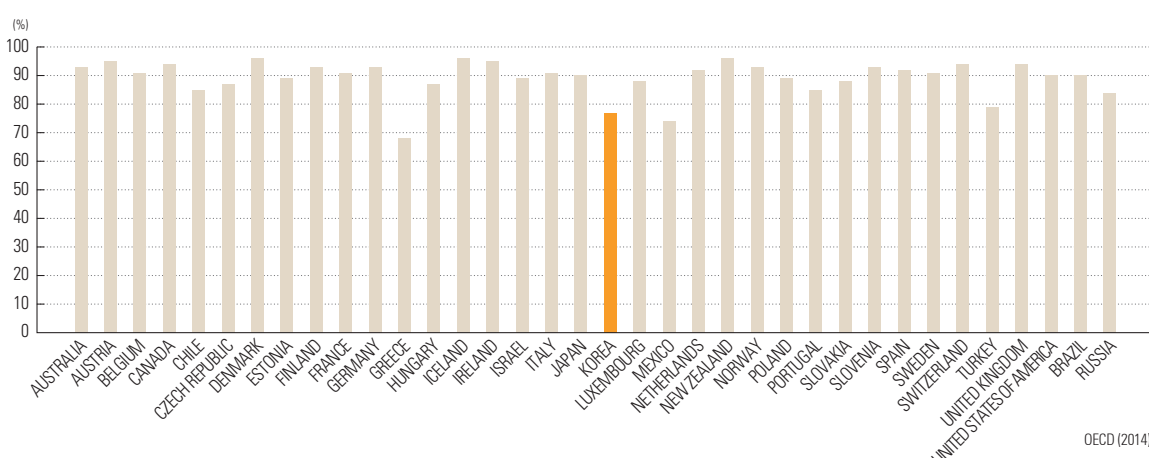
Social Support Networks represent the percentage of people who have friends or relatives to rely on in case of need. The frequency of contacts with others and the quality of personal relationships are other important determinants of the quality of life. Consultation on Rule-making is the level of government transparency during the drafting of regulations. Specifically, it reflects the extent to which formal consultation processes are built-in to the regulatory law-making process. Perception of

government reliability is crucial to the social coherence and general happiness. Voter turnout is defined as the percentage of the registered population that voted during an election. High voter turnout is desirable in a democracy because it increases the chance that the political system reflects the will of a large number of individuals, and that the government enjoys a high degree of legitimacy.

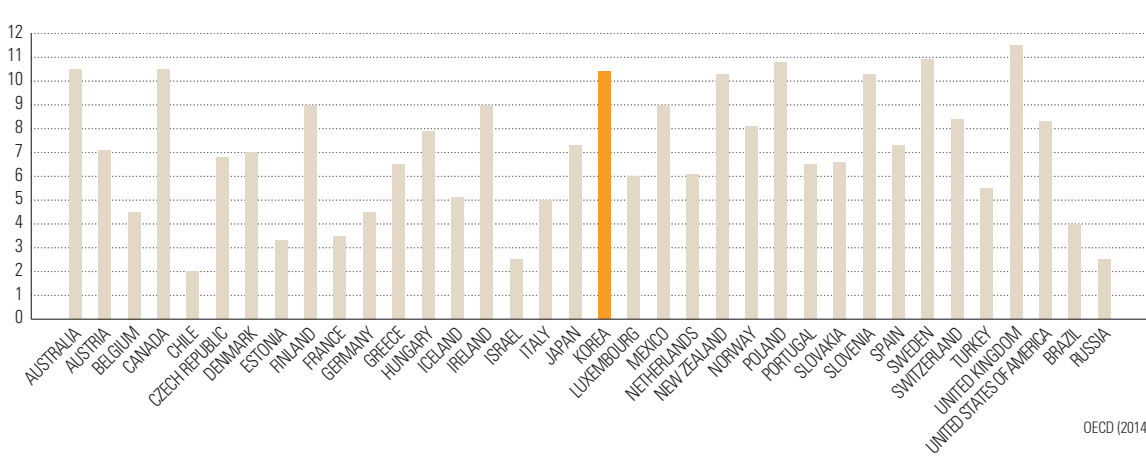
Through social participation, citizens measure the current standards of quality of life of themselves and the overall quality of life of the society that they belong to. It also allows them to search for ways to improve their quality of life and to monitor their fulfillment. The tradition of active social participation of individuals and groups in a civil society is at the root of democracy and allows for a deeper sense of belonging and greater healthiness and resiliency.

Social participation may take different forms. The most representative of these is participation in social decision making primarily through voting in both elections at the central government level, presidential elections and parliament elections, as well as those occurring at the local level. Voter turnout has trended downward from the 1945 Liberation up to the present, which suggests that increasing citizen participation in the political process should be a high priority. Active participation in politics is an important way to improve the quality of life. Individual social support networks and access to social welfare facilities and cultural facilities are also important to the evaluation of the quality of life.

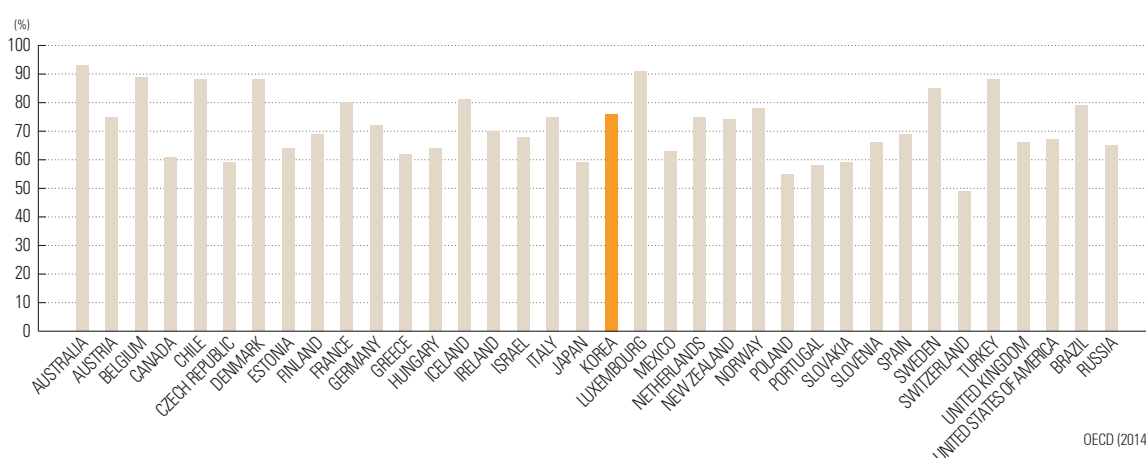
Quality of Support Network



Consultation on Rule-making

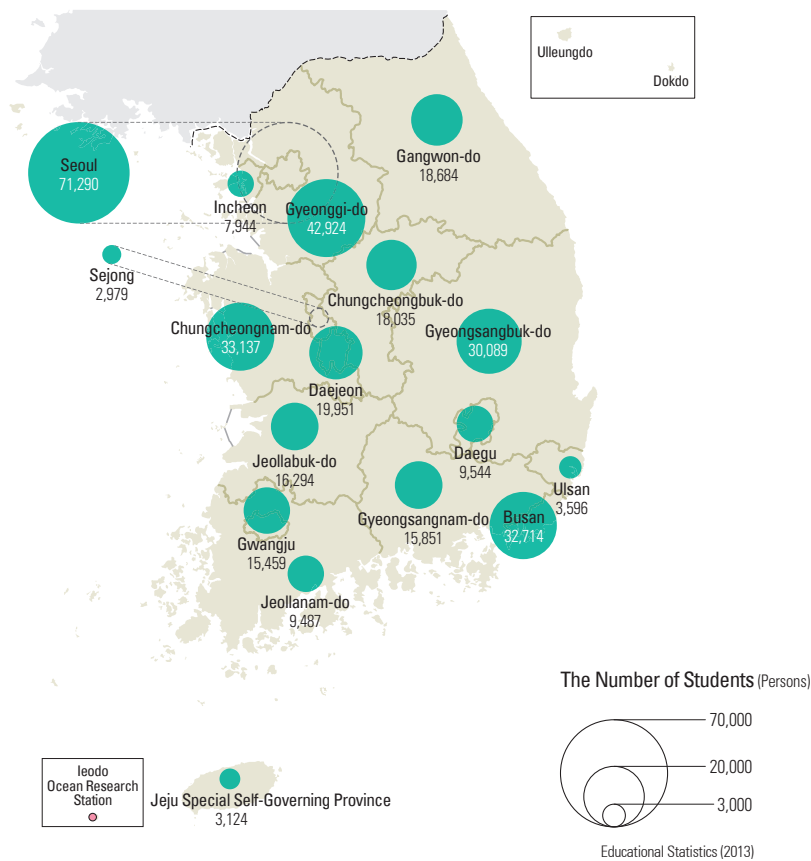


Voter Turnout

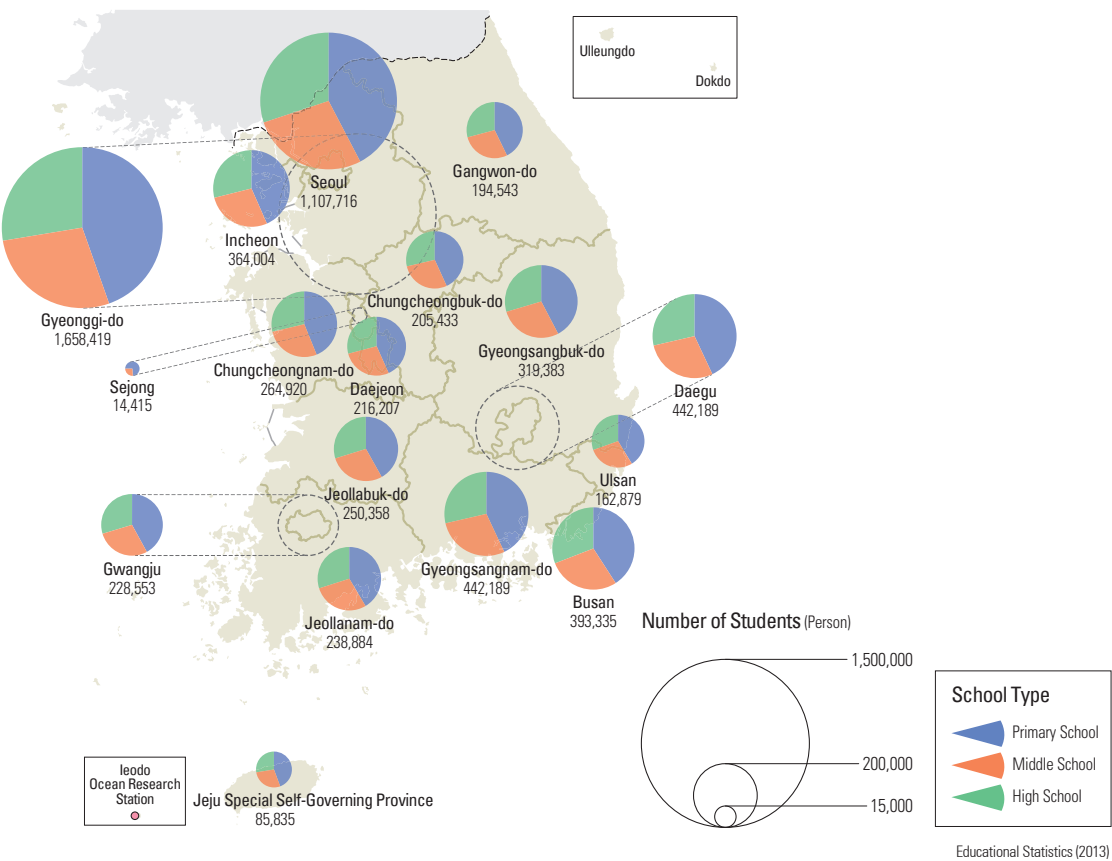


Education

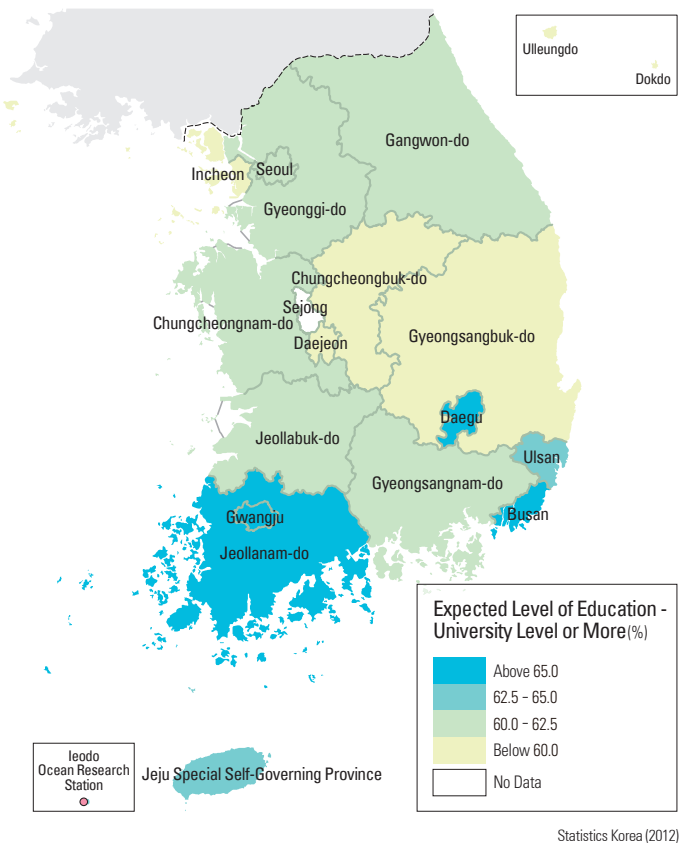
University Entrance Quota by Si · Do



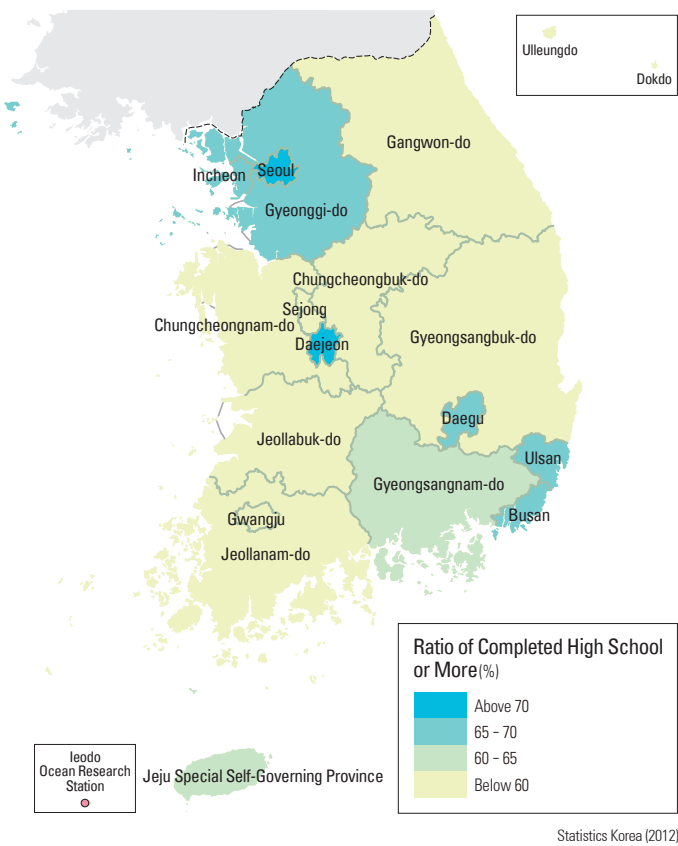
Number of Students of Primary, Middle and High Schools by Si · Do



Expected Level of Education by Si · Do



Percentage of People Who Completed High School or More by Si · Do

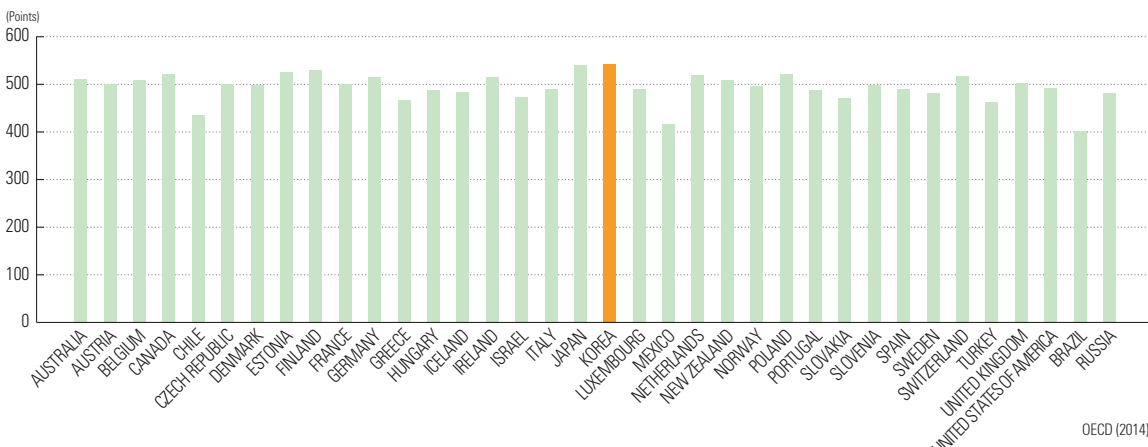


Korean culture has been deeply influenced by Confucianism, which has resulted in a high level of enthusiasm for education. Since the liberation from Japanese imperial rule in 1945, Korean society has experienced socially and economically difficult periods throughout which education has played an important role. First, education has helped to emphasize the role of the citizen in a democratic society. Second, education also provides the tools for enhancing both personal and national growth. The OECD emphasizes the great importance of education in general, but it also promotes equity of educational opportunities because it recognizes the very clear correlation between the quality of life of both individuals and the society-at-large and over all educational accomplishments. In order to determine both the quality and the availability of educational opportunities in Korea, statisticians measure the ratio of citizen completing basic education from region to region as well as the correlation between educational accomplishments and the productivity of individuals and the country as a whole. Because Korea's population is aging, there has been a decrease in the school-age population. In fact, the university enrollment quotas are expected to soon become larger than the number of secondary school students, which suggests that a restructuring of universities may become necessary.

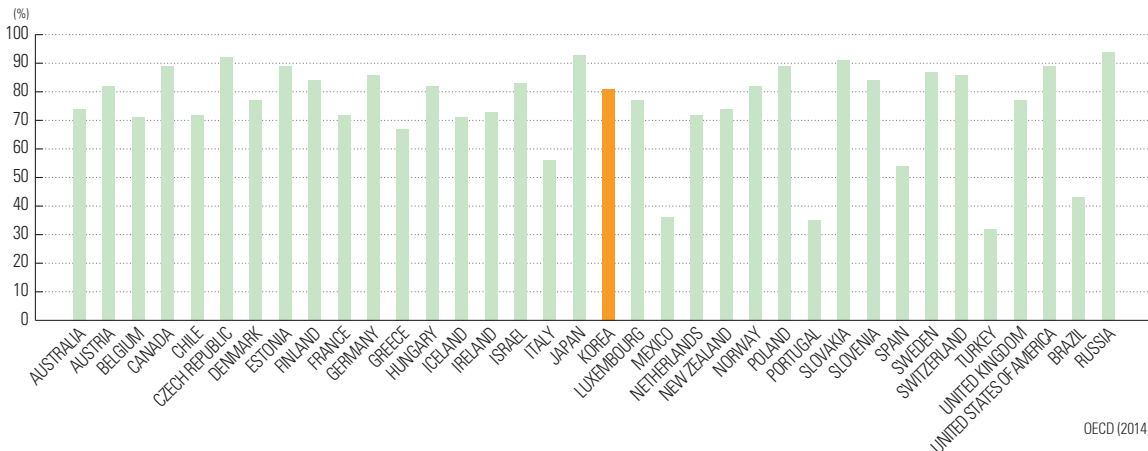
The number of years in education is the average duration of formal education in which a five-year old child can expect to enroll during his/her lifetime until the age of 39. In a fast-changing knowledge-based economy, education is about learning skills for life. Educational attainment is defined as the percentage of people aged 25 to 64 having at least an upper-secondary (high-school) degree. Students' skills refer to the average performance

of students aged 15, according to PISA (Programme for International Student Assessment). This reflects the extent to which students near the end of their compulsory education (usually around age 15) have acquired some of the knowledge and skills that are essential for full participation in modern society, particularly in reading, mathematics, and science.

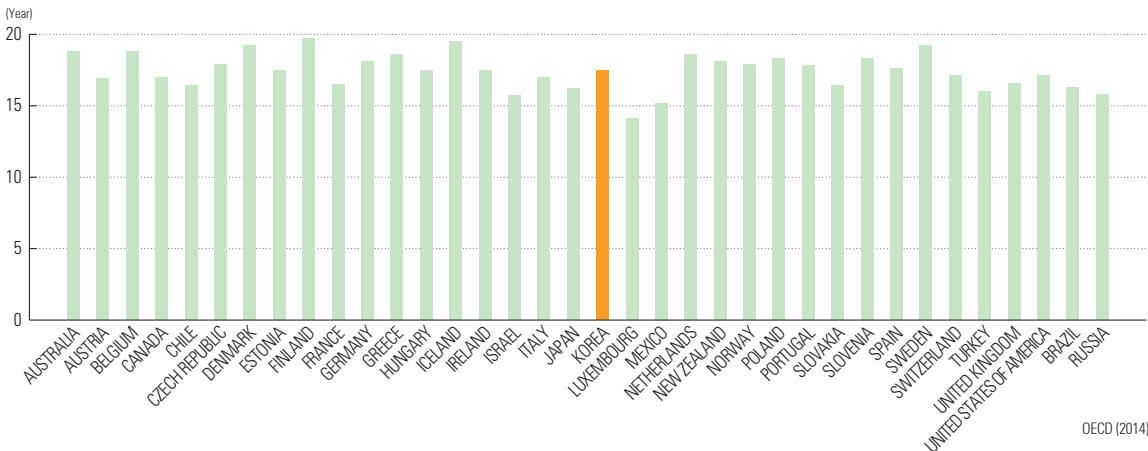
Students' Skills



Percentage of Adults Who Completed High School or More

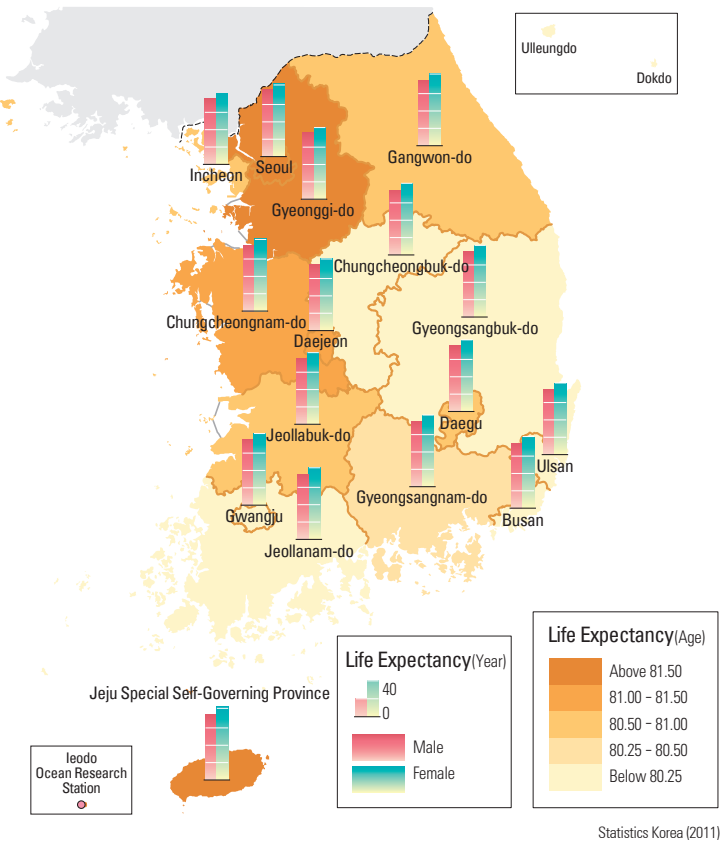


Years in Education

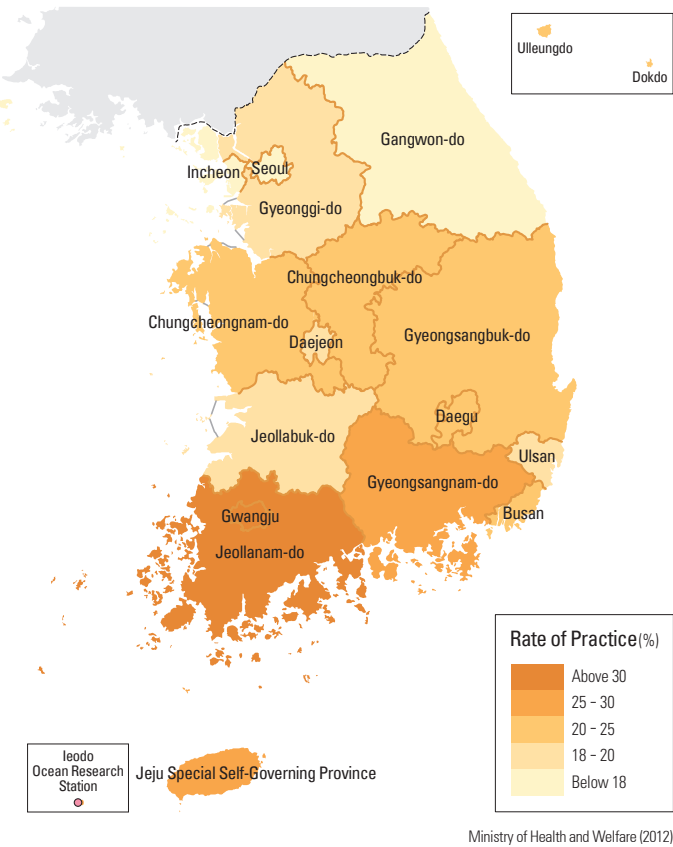


Health and Safety

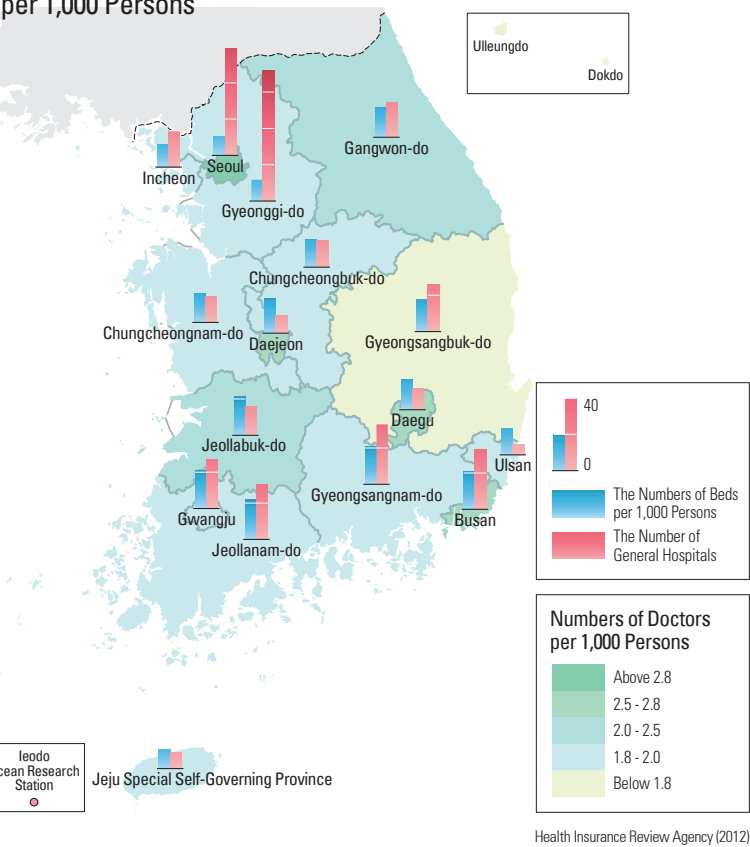
Life Expectancy



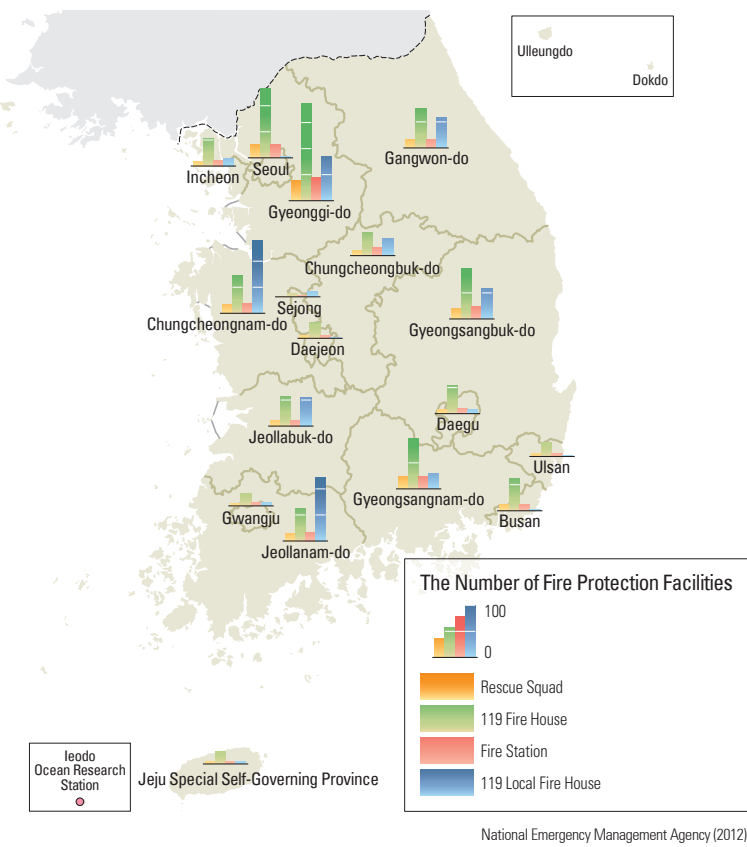
Rate of Practice of Physical Activity



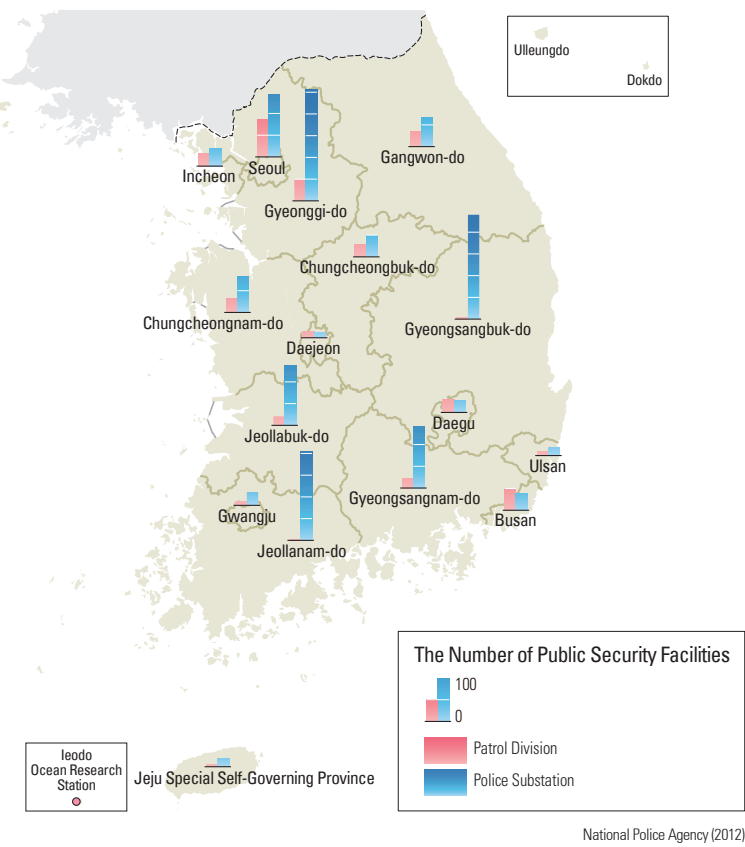
Number of General Hospitals and the Numbers of Beds and Doctors per 1,000 Persons



The Number of Fire Protection Facilities



The Number of Public Security Facilities



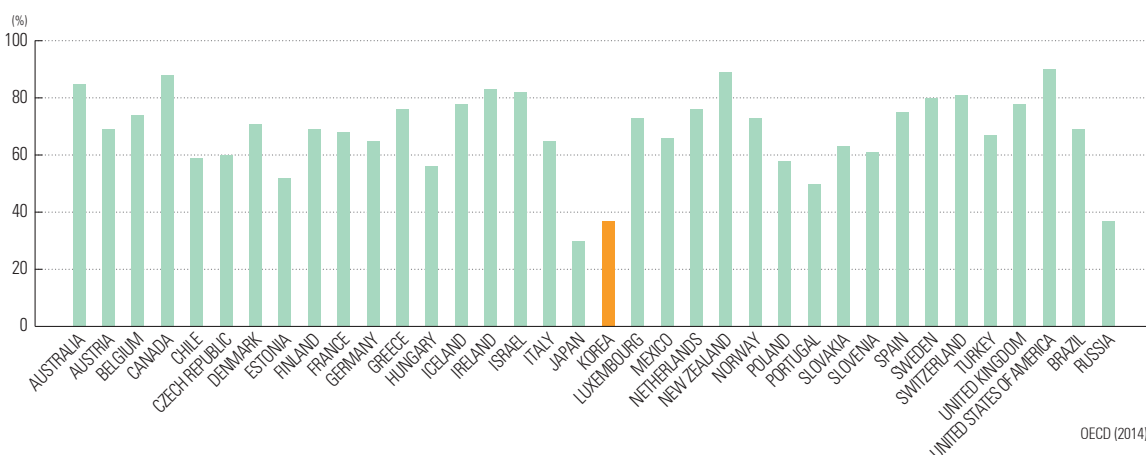
Public safety and public health are two critical measures of the quality of life of any society. One of the most widely used measures of public health is life expectancy, the average number of years a person can expect to live. Life expectancy is very high in the capital region and in Jeju. The reason for this may be that the capital region has the better medical infrastructure, and Jeju has more green space and better services and amenities-- though there are significant differences between si-gun-gu units within these regions. The difference between life expectancy for men and women is as high as 7 years as of 2011. While the number of years of life expectancy is important, how well the elderly manage their health is also an important factor to monitor.

The regional distributions of the fire department and police substations are the indicators that indirectly show the regional ability to properly response to the criminal action and accident in the region. As for the better operation of such important safety agencies and organizations for the better response to the criminal mishap and accident disaster, the discussion recently becomes active on the pros and cons of the locally distributed organization system considering the distinct characteristics of the region and the centralized organization system unifying the nationwide matters for the timely and strong implementation.

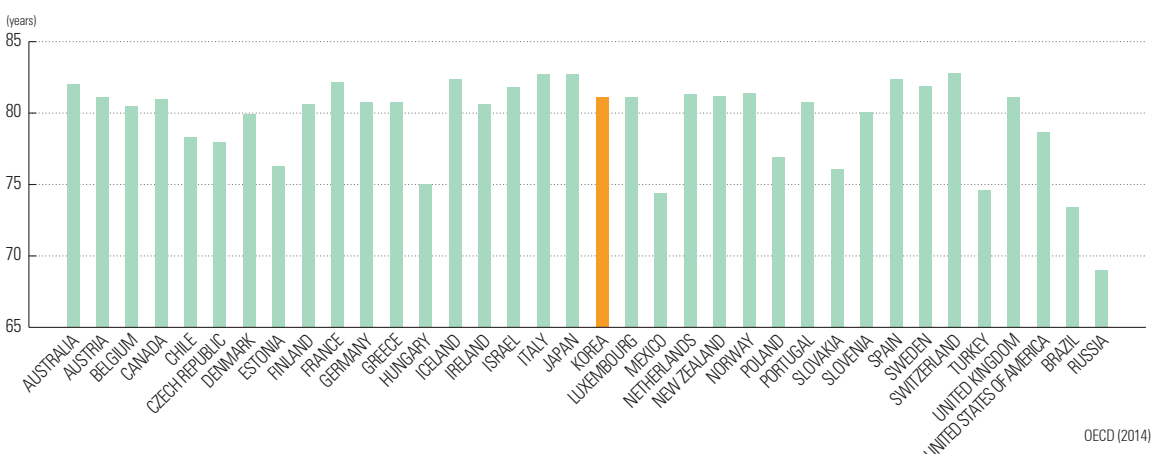
Life Expectancy is average number of years a person can expect to live. There have been remarkable gains in life expectancy over the past 50 years in OECD countries. Life expectancy is the most widely used measure of health even though it only takes into account the length of people's life and not their quality of life. Self-reported health is the percentage of people reporting the status of their own health. The commonly-asked question, "How

is your health?" is one way of collecting data on self-perceived health status. Despite the subjective nature of this question, the answers received have been found to be a good predictor in gauging the need for future health care policies. The assault rate is percentage of people who report having been assaulted in the previous year.

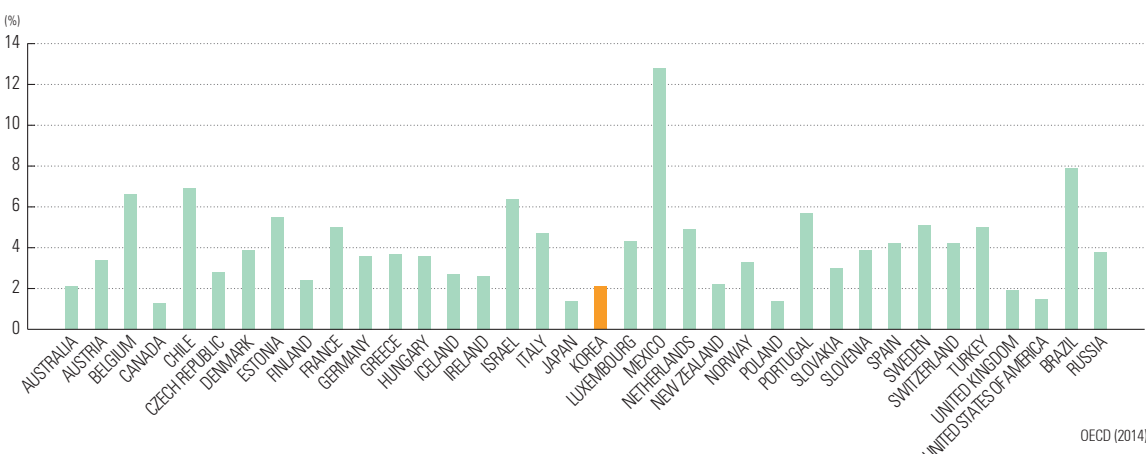
Self-reported Health



Life Expectancy

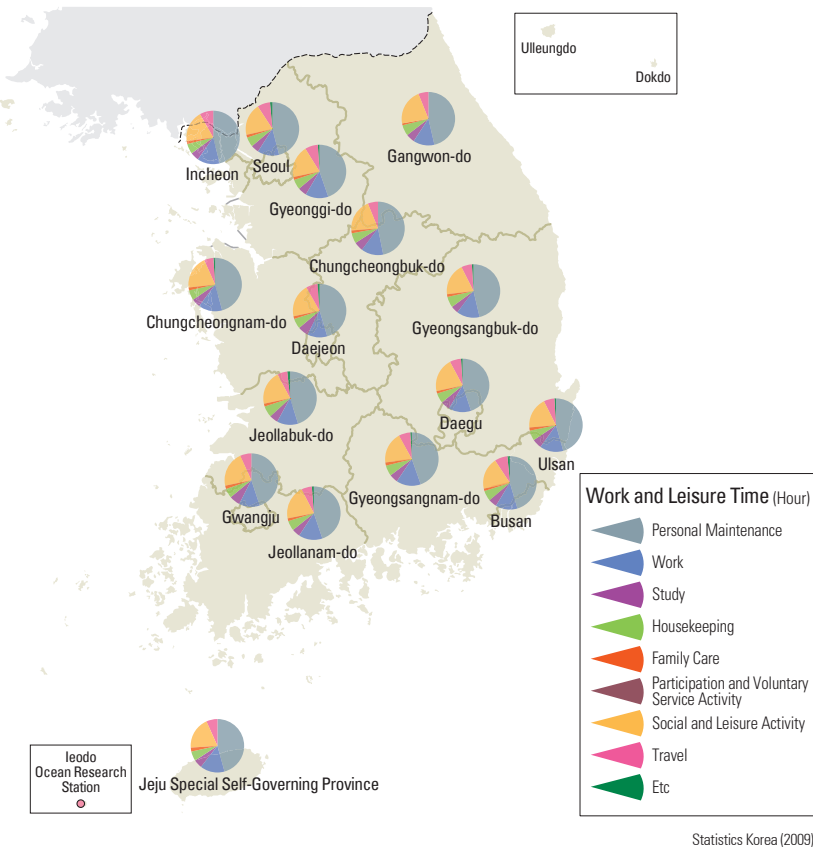


Assault Rate

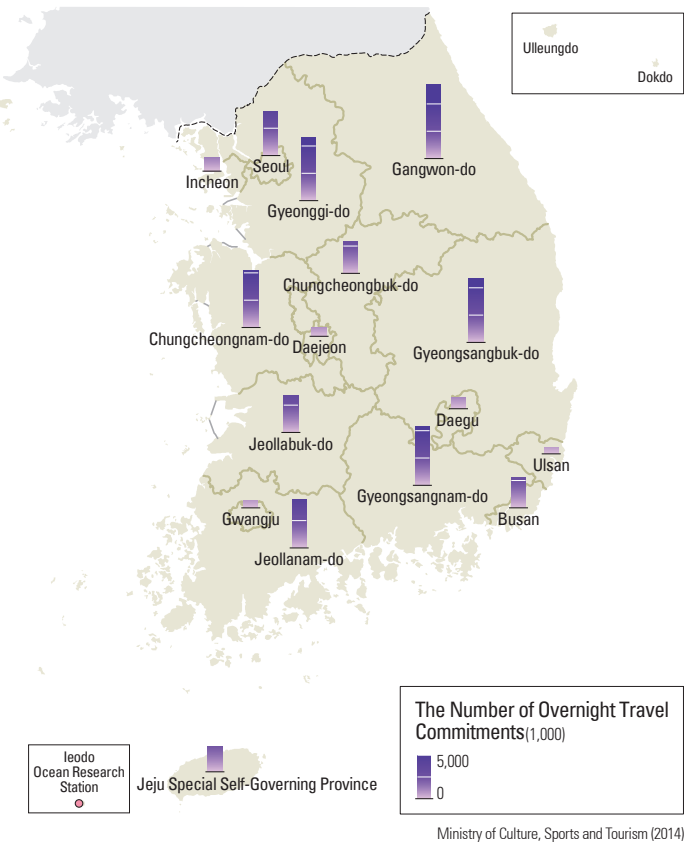


Personal Satisfaction and Work-leisure Balance

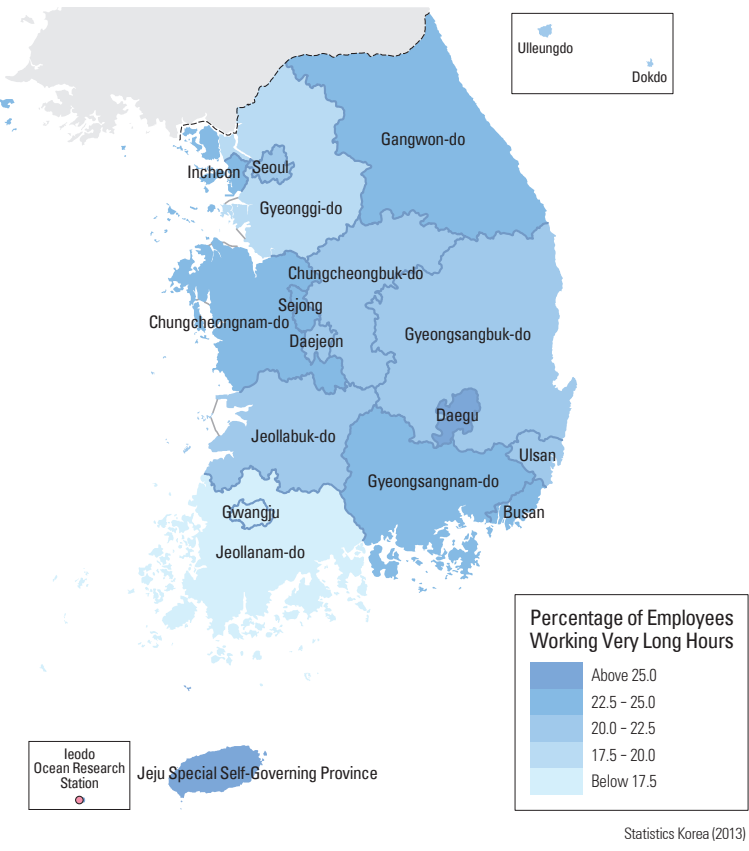
Work and Leisure Time Use (by Region)



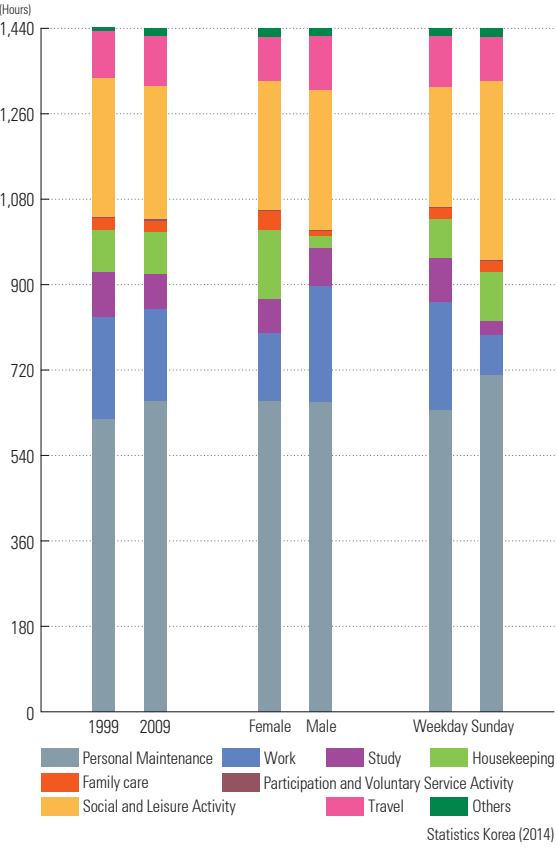
Travel Commitment



Percentage of Employees Working Very Long Hours



Work and Leisure Time Use(by Year, Sex and Day)



Summer Vacation (Valley)



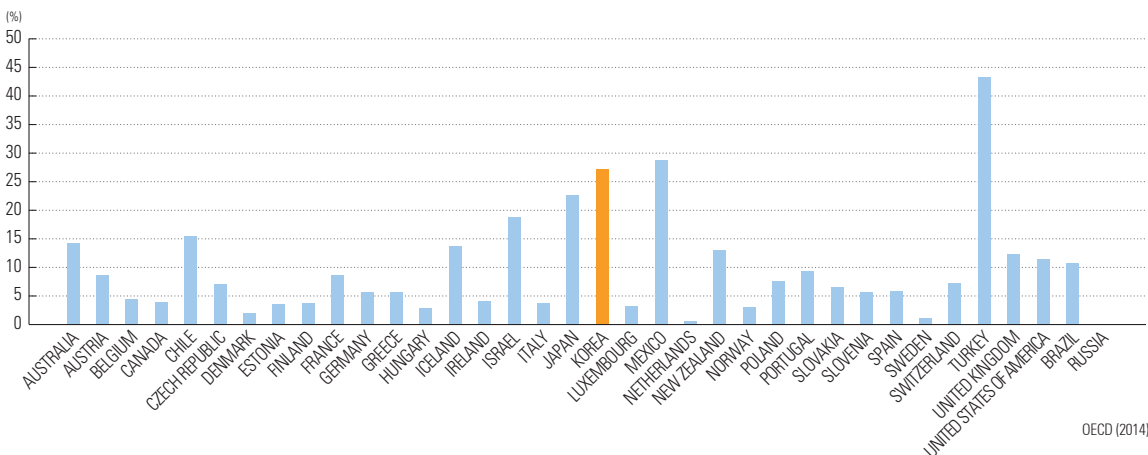
Summer Vacation (Sea)

Twenty-four hours a day is given to everyone equally. A work day with long hours implies a direct decrease in quality of life and also places a constraint on participating in other important activities outside of work. These constraints may directly lead to social exclusion and social justice problems, particularly between regions and/or between social classes. Because there are obvious connections between time available for non-work activities and quality of life. Statistics Korea has been conducting a nationwide time use survey once every 5 years since 1999. The survey investigates individual time use and individual attitudes toward time use, which provides a framework measuring quality of life.

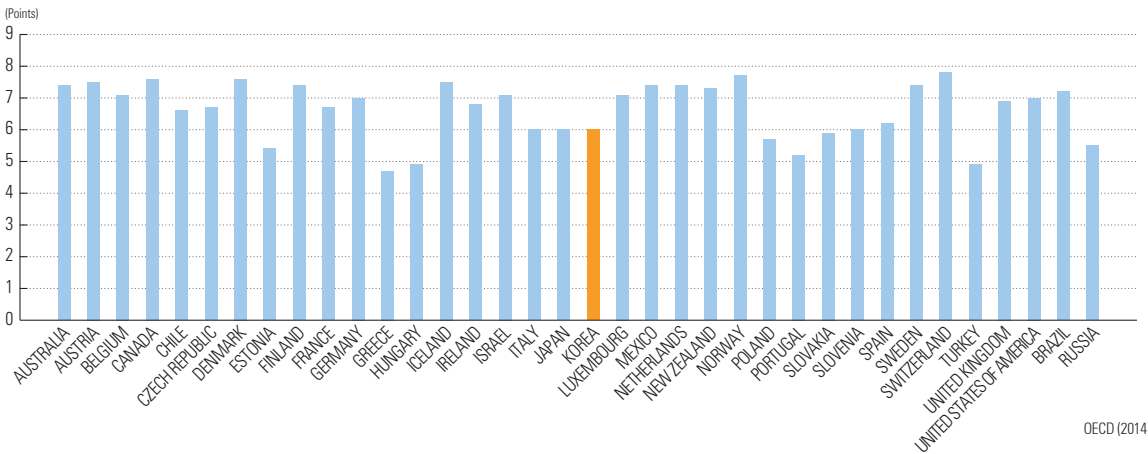
Life Satisfaction is an index that measures the average self-evaluation of life satisfaction on a scale from 0 to 10. It measures how people evaluate their life as a whole rather than their current feelings. It captures a reflective assessment of which life circumstances and conditions are important for subjective well-being. Time devoted to the index Leisure and Personal Care is the

average number of minutes per day spent on leisure and personal care, including sleeping and eating. The index Employees Working Long Hours is percentage of employees working more than 50 hours a week on average. Long work hours may impair personal health, jeopardize safety, and increase stress.

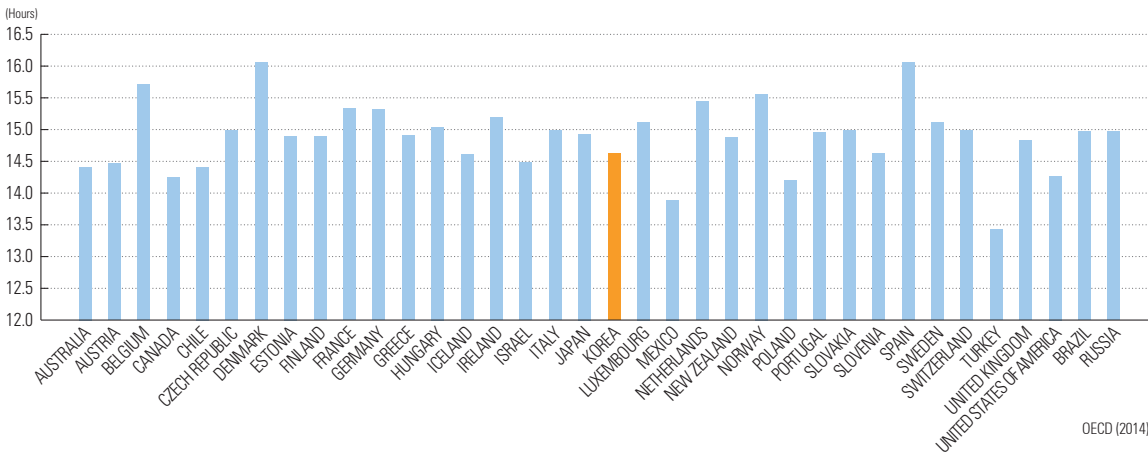
Employees Working Very Long Hours



Life Satisfaction

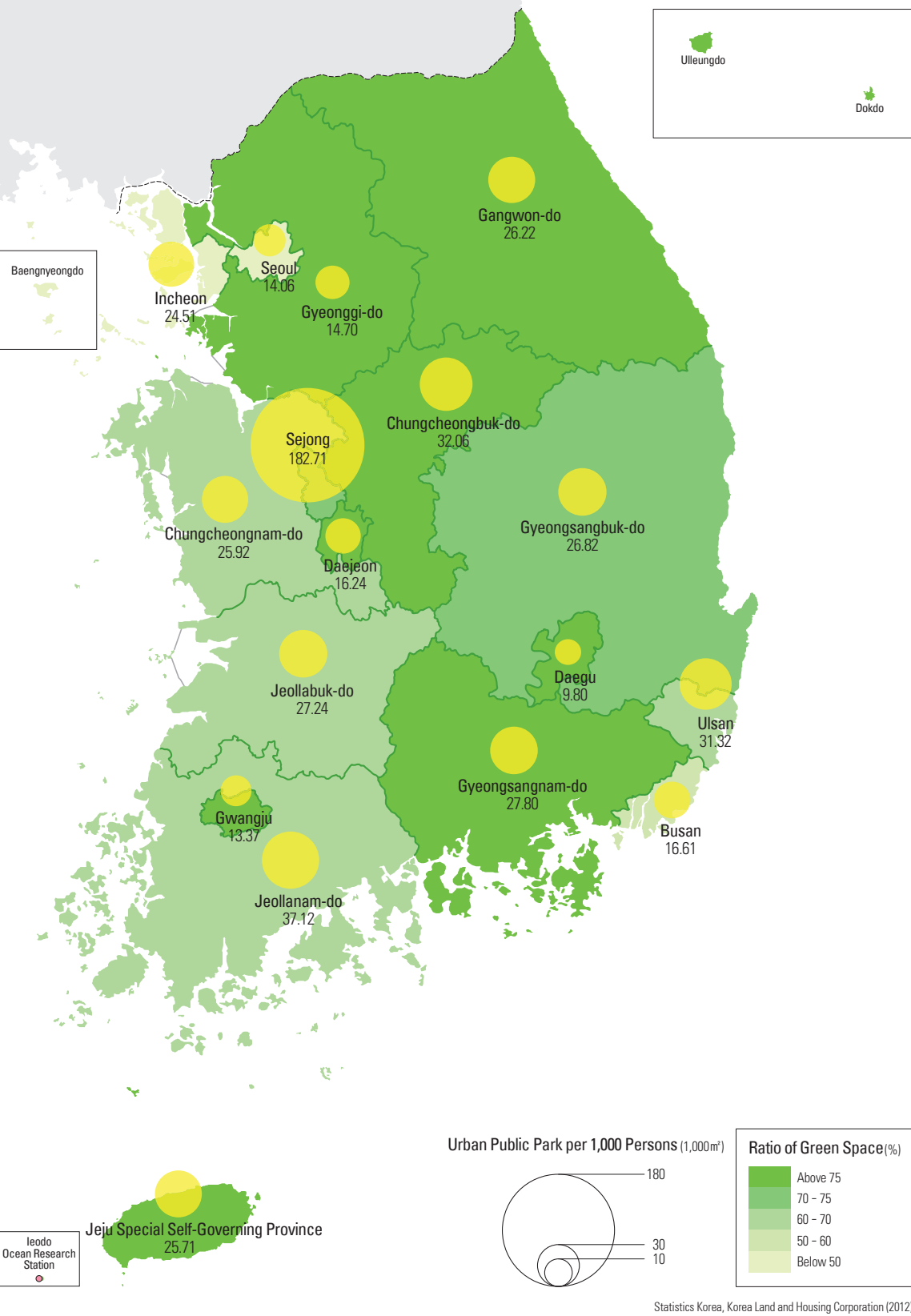


Time Devoted to Leisure and Personal Care

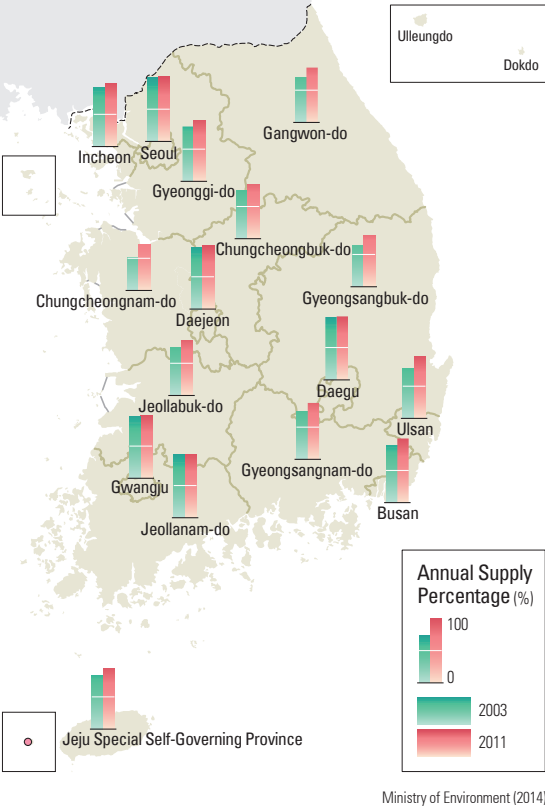


Living Environment

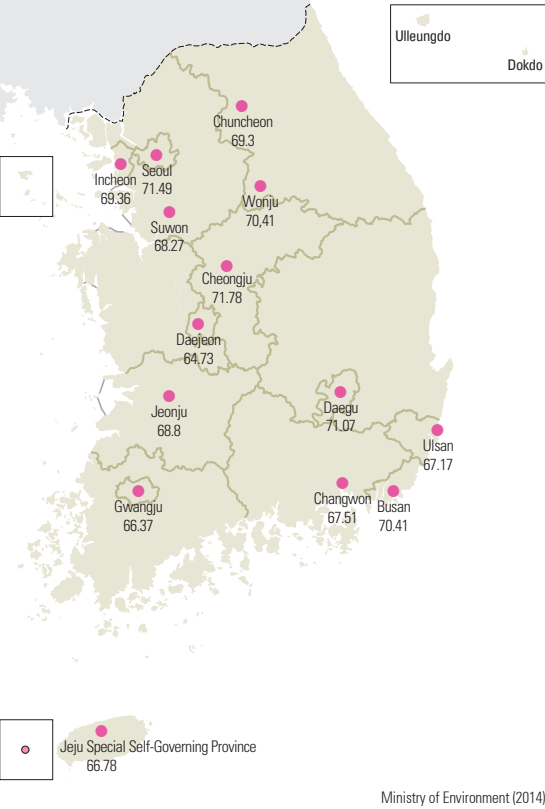
Green Space and Urban Public Park Ratio



Water and Sewage Supply Percentage



Environmental Noise(dB)

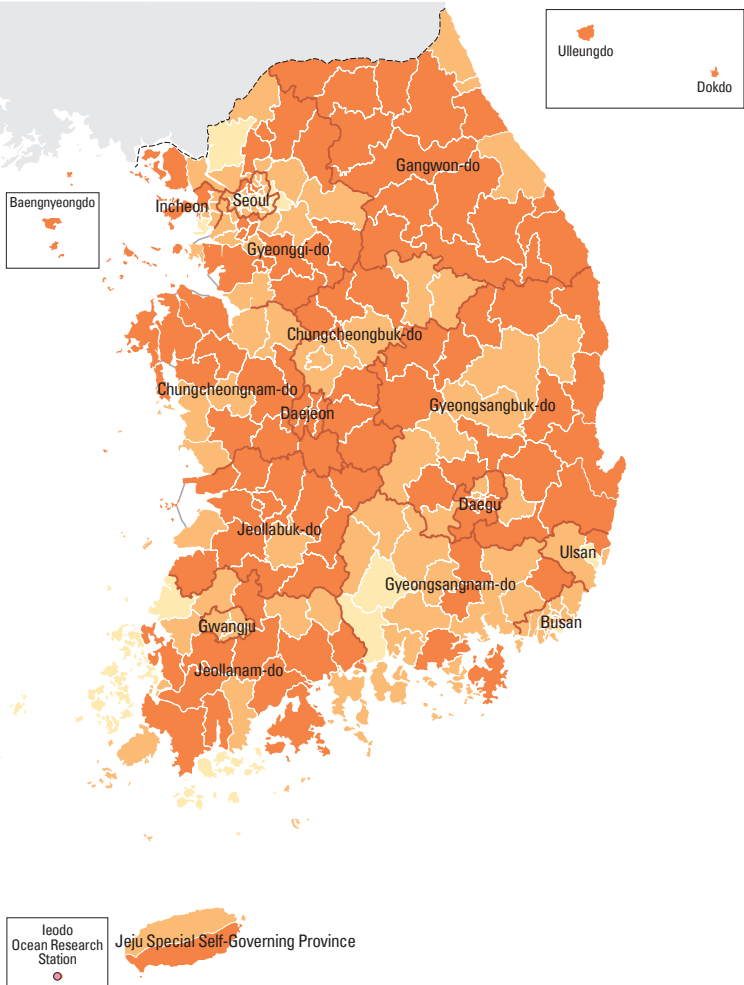


A higher quality of life typically is associated with such amenities as green spaces and public parks, conveniences such as water and sewage provision, and necessities such as the reduced risk of noise and radioactivity, as well as general risk management. The Sejong Multifunctional Administrative City contains an overwhelmingly high percentage of public parks. Large local governments' green tract ratios show that Gangwon-do, Gyeonggi-do, Chungcheongbuk-do, and Gyeongsangnam-do, which are all located within mountainous areas, contain a larger share of green spaces, but there are significant variations in such ratios between si-gun-gu (city-county-district) within larger local governments. The broad provision of both clean water and waste management is also a high priority especially in light of the fact that Korea is the representative country of water shortage within the OECD. Noise pollution is a pronounced problem in large cities, particularly in those with heavy industry and

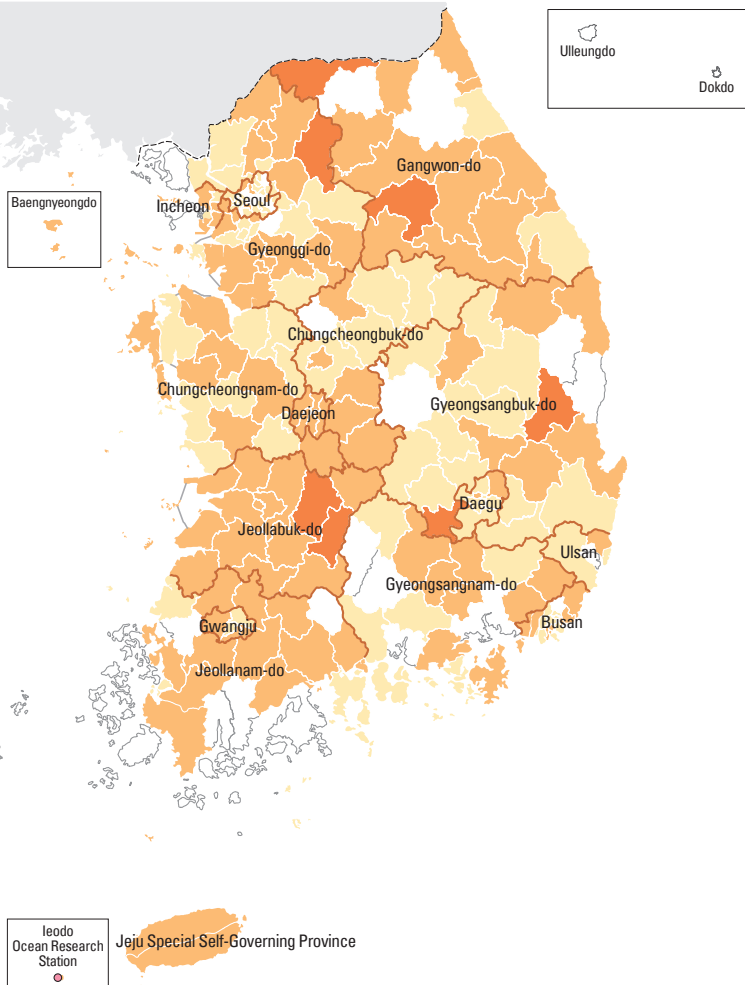
airports in their vicinities. Radon is a colorless, odorless and tasteless gas that is generated as a result of the process of uranium's radioactive decay in rocks. It is a natural radioactive process that is found everywhere on earth. Radioactivity includes crust radiation from rocks, cosmic radiation from the stars, natural radiation from air and food, and artificial radiation from radioactive power plants, X-ray and chemo-radiation therapy equipment. The patterns on the radon distribution maps clearly show that the highest concentration of radon occurs away from urban areas and away from highly populated areas in Korea. While radon can be a health hazard with prolonged exposure, it is less hazardous in rural areas where the amount of concrete surfaces is less and therefore less of this gas is trapped.

Regional Distribution of Radon

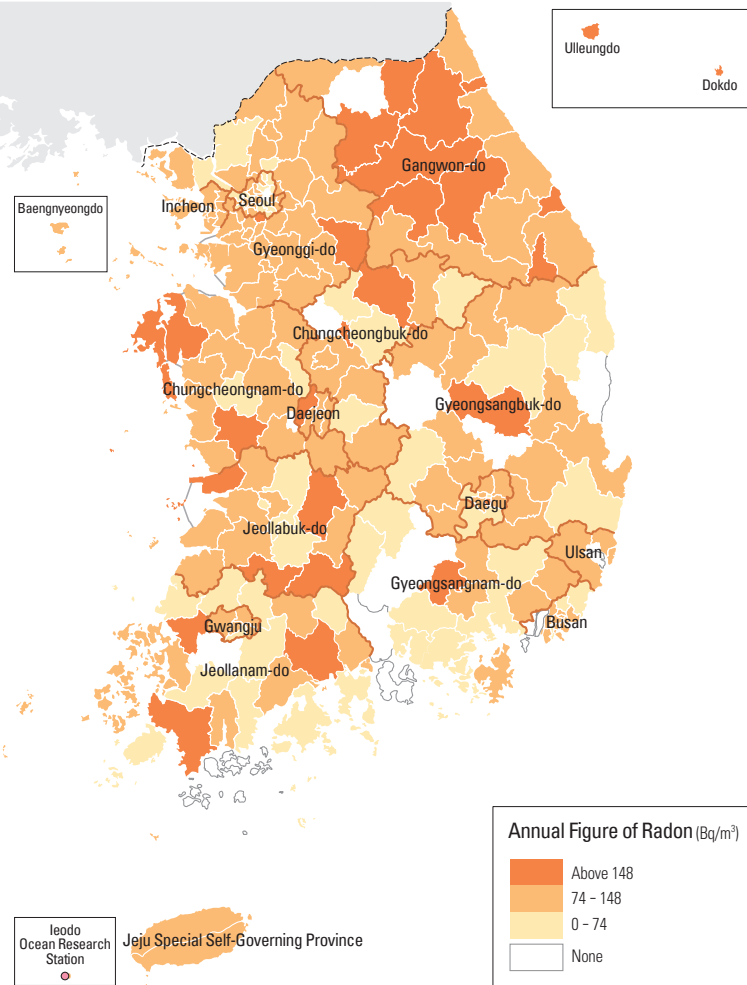
Geographical Distribution of Radon: Detached House Area



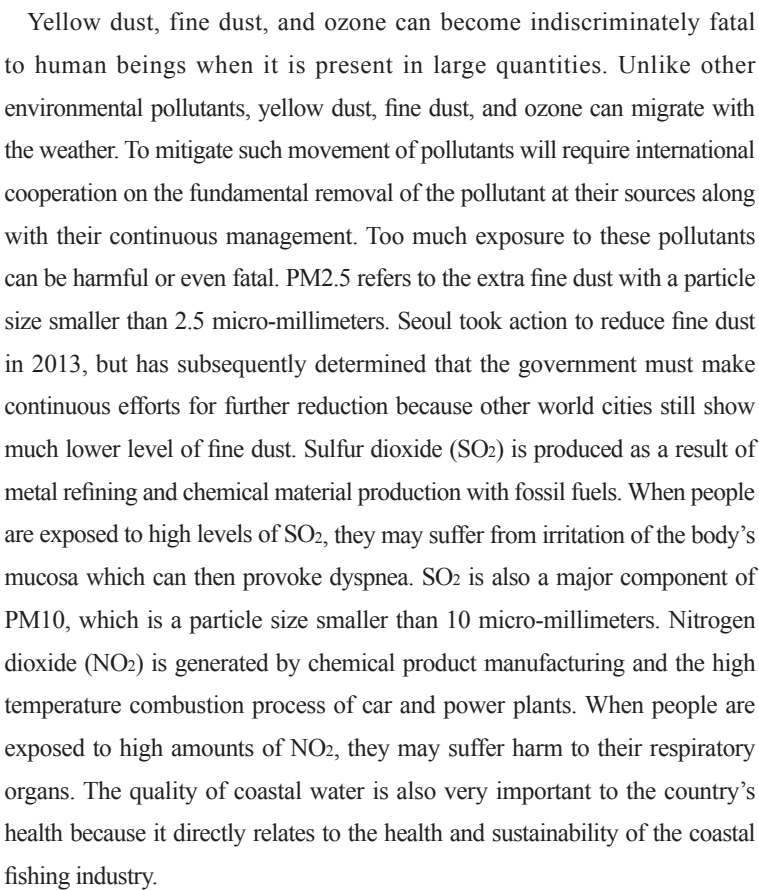
Geographical Distribution of Radon: Apartment Area



Geographical Distribution of Radon: Multiplex House Area



Yellow Dust Observation Site and the Number of Observation Days



Ozone concentration (ppm)

- 0.150 Over
- 0.125 - 0.150
- 0.100 - 0.125
- 0.100 Below

Ministry of Environment (2012)

Fine dust concentration ($\mu\text{g}/\text{m}^3$)

- Above 170
- 150 - 170
- 120 - 150
- Below 120

NO₂ concentration (ppm)

- Above 0.15
- 0.10 - 0.15
- 0.08 - 0.10
- Below 0.08

Ministry of Environment (2012)

SO₂ concentration (ppm)

- Above 0.06
- 0.04 - 0.06
- 0.02 - 0.04
- Below 0.02

Jeju Special Self-Governing Province

Ministry of Environment (2012)

µg/m³

| City | 2011 | 2012 | 2013 |
|--------------|------|------|------|
| Seoul Korea | 28.8 | 29.3 | 25.2 |
| Paris France | 18.0 | 17.0 | 15.0 |
| LA USA | 17.3 | 23.5 | 17.9 |
| London UK | 16.0 | 17.0 | 16.0 |
| New York USA | 11.5 | 12.2 | 13.9 |

Ministry of Environment

Map of South Korea showing the distribution of Chemical Oxygen Demand (COD) in mg/L at various locations in 2013. The map is color-coded by COD levels: dark red for above 1.5, orange for 1.0-1.5, yellow for 0.8-1.0, and light yellow for below 0.8.

Locations and COD values (mg/L):

- Incheon: 1.52
- Sihwa: 2.96
- Gangwon-do
- Gyeonggi-do
- Seoul
- Chungcheongbuk-do
- Chungcheongnam-do
- Sejong
- Daejeon
- Gyeongsangbuk-do
- Jeollabuk-do
- Jeollanam-do
- Gwangju: 1.16
- Hamgyeong Seacoast: 1.16
- Doamman: 0.74
- Deungnyeong: 1.65
- Wando Seacoast: 0.65
- Gamsilman: 1.55
- Haengnam: 2.36
- Masan: 3.20
- Gyeongsangnam-do
- Ulsan: 1.05
- Onsan: 1.07
- Busan: 0.97
- Nakdonggang Estuary: 3.20
- Jinhaeman: 1.40
- Sinhang: 1.15

Legend:

- Chemical Oxygen Demand (mg/L)
- Above 1.5
- 1.0 - 1.5
- 0.8 - 1.0
- Below 0.8

Jeonju Special Self-Governing Province

Jeonju Ocean Research Station

Ulleungdo

Dokdo

MOLT (2013)

Population and Human Settlement

Population affects the characteristics of a nation’s politics, economy, culture, and infrastructure. The key characteristics of the population of a country or region include population distribution, population structure, and population migration. Population distribution is the population sizes of regions at a particular time. Population structure is the composition of the population of a region that denotes particular demographic attributes, including such important variables as age, sex, income, and household composition. Migration is the population movement between regions over a particular time period. Changes in population distribution come from natural increase and decrease (births and deaths)

and migration. Natural increases and decreases of the population are monitored with statistics on total fertility and mortality rates. Migration, on the other hand, is affected by the geographical distribution of the political, economic, social, cultural, and spatial characteristics. Such influences function as determining factors for population influxes and outflows between regions; as a result, the socio-spatial process of migration takes place. Population migration includes regional in-migration and out-migration domestically and international migrations. Domestic migration is classified as the migration between urban and rural areas, between city and city, and among rural areas. In general, economic, demographic, and geographic

factors jointly affect migration patterns. The following maps illustrate population distributions at the national level in Korea for every ten years since 1980. Each dot represents 1,000 persons at the city, county and district (si-gun-gu) levels. These maps enable one to identify both over-populated and under-populated areas. Population distribution patterns differ over time and they can be used to identify the growth or decline of population spatially. Understanding population distribution is of paramount importance since it is a synopsis of political, economic, social, cultural, and spatial patterns of the country at the national and regional levels. Over the past several decades the population of Korea has moved up to the north of the country and more recently into the north-

west region, which suggests that the importance of the Seoul region has been growing. A centroid is the center of a distribution of population; it is a point from which the sum of distances to all people of the country is minimized. The changing position of this centroid indicates the characteristics of population distribution change over time. As clearly shown on the map showing Korea’s centroids over the decades, the centroids shifted to the north and in particular to northwest more recently. This again implies that the importance of the Capital Region has been growing.

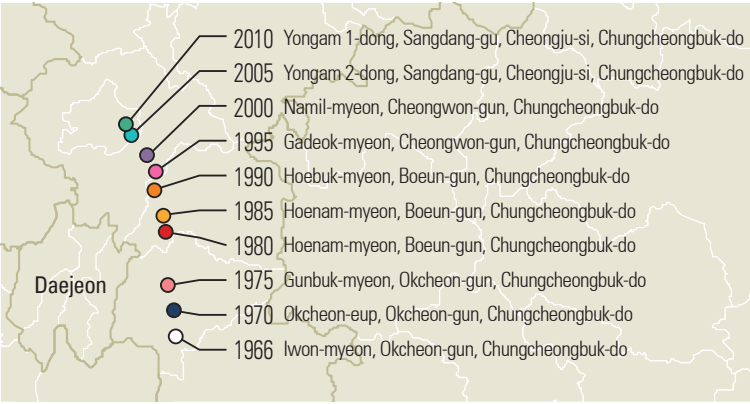


Urban Area



Rural Area

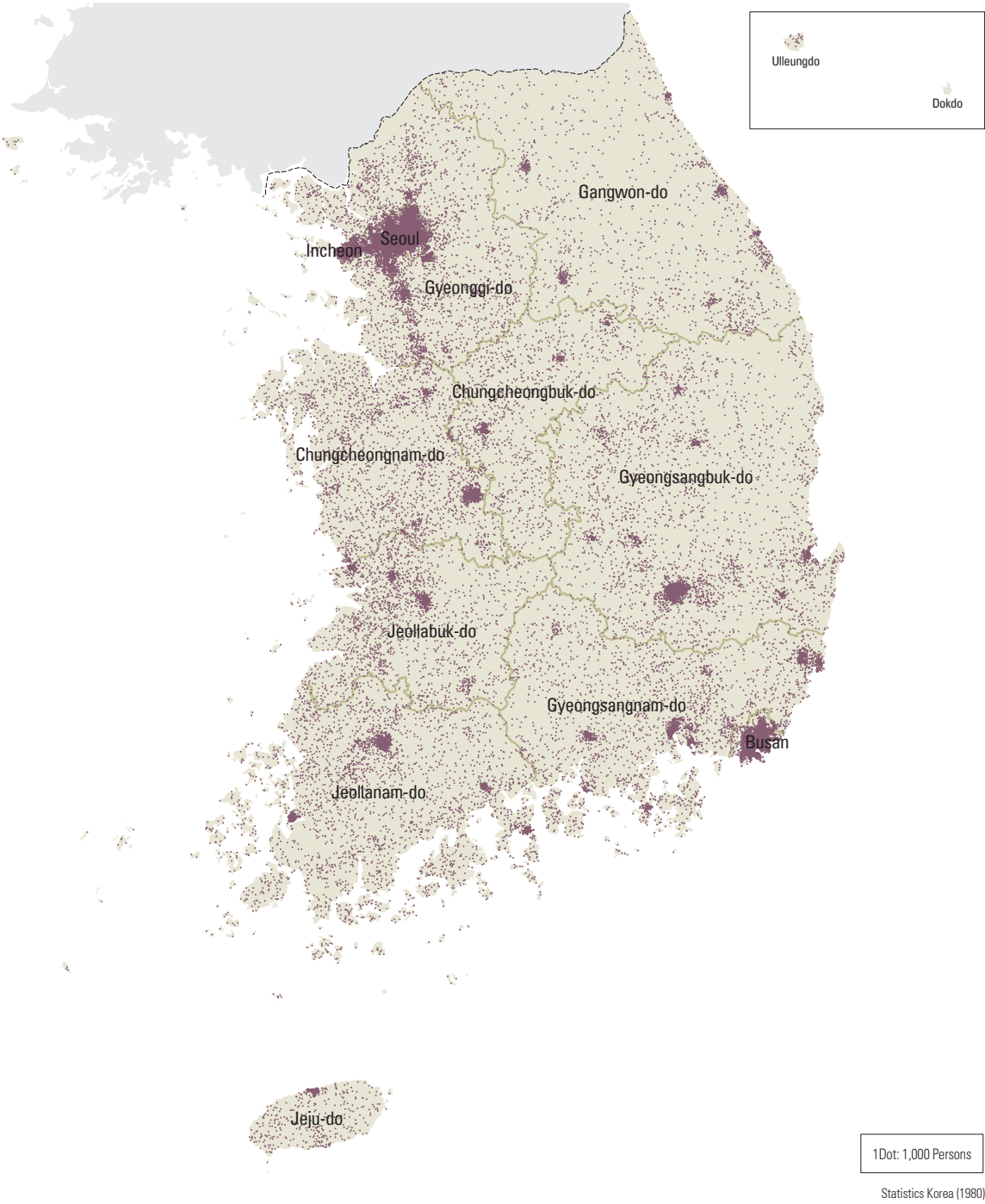
Geographic Centers of Population in Years



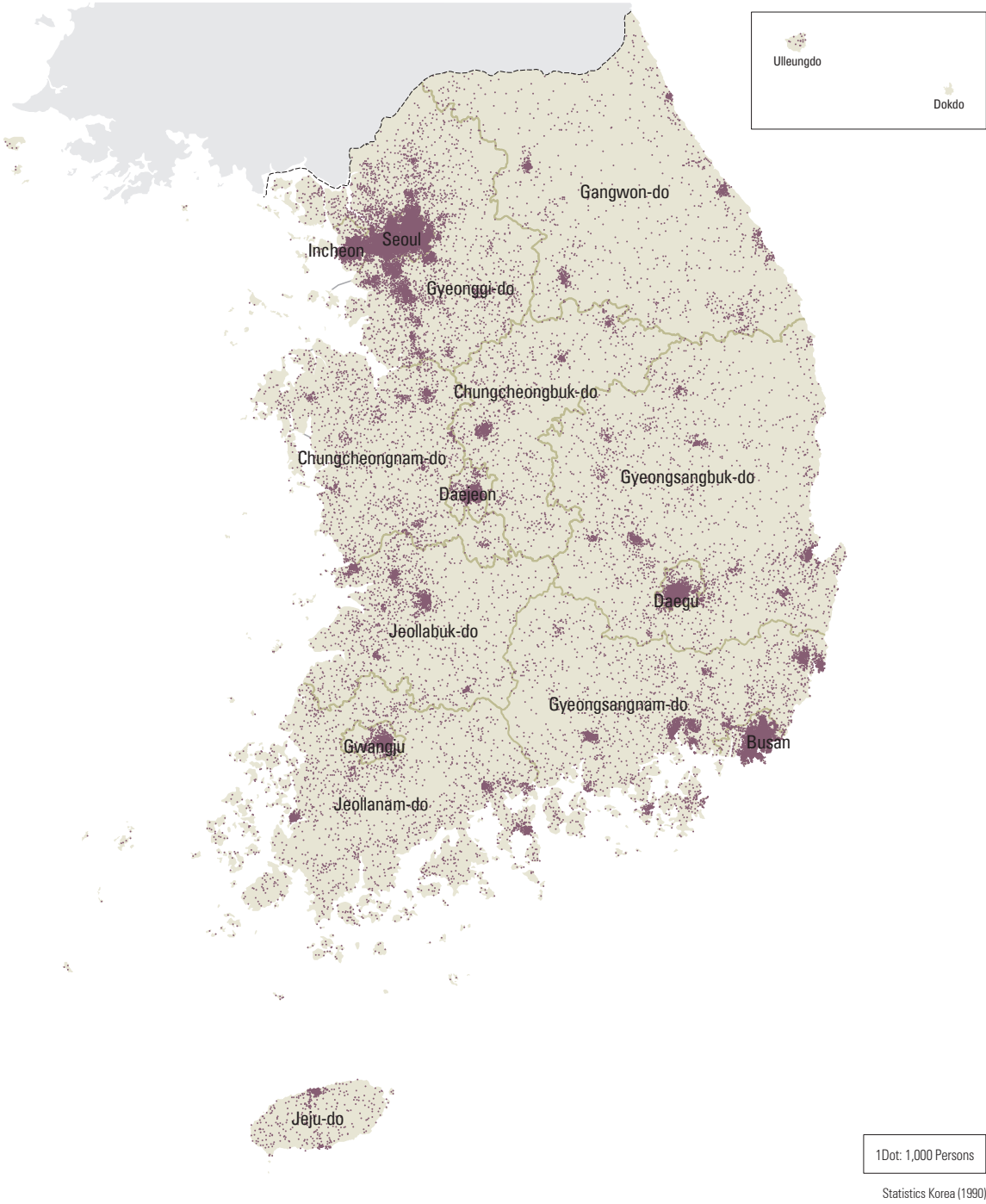
Statistics Korea (2013)

Population Distribution

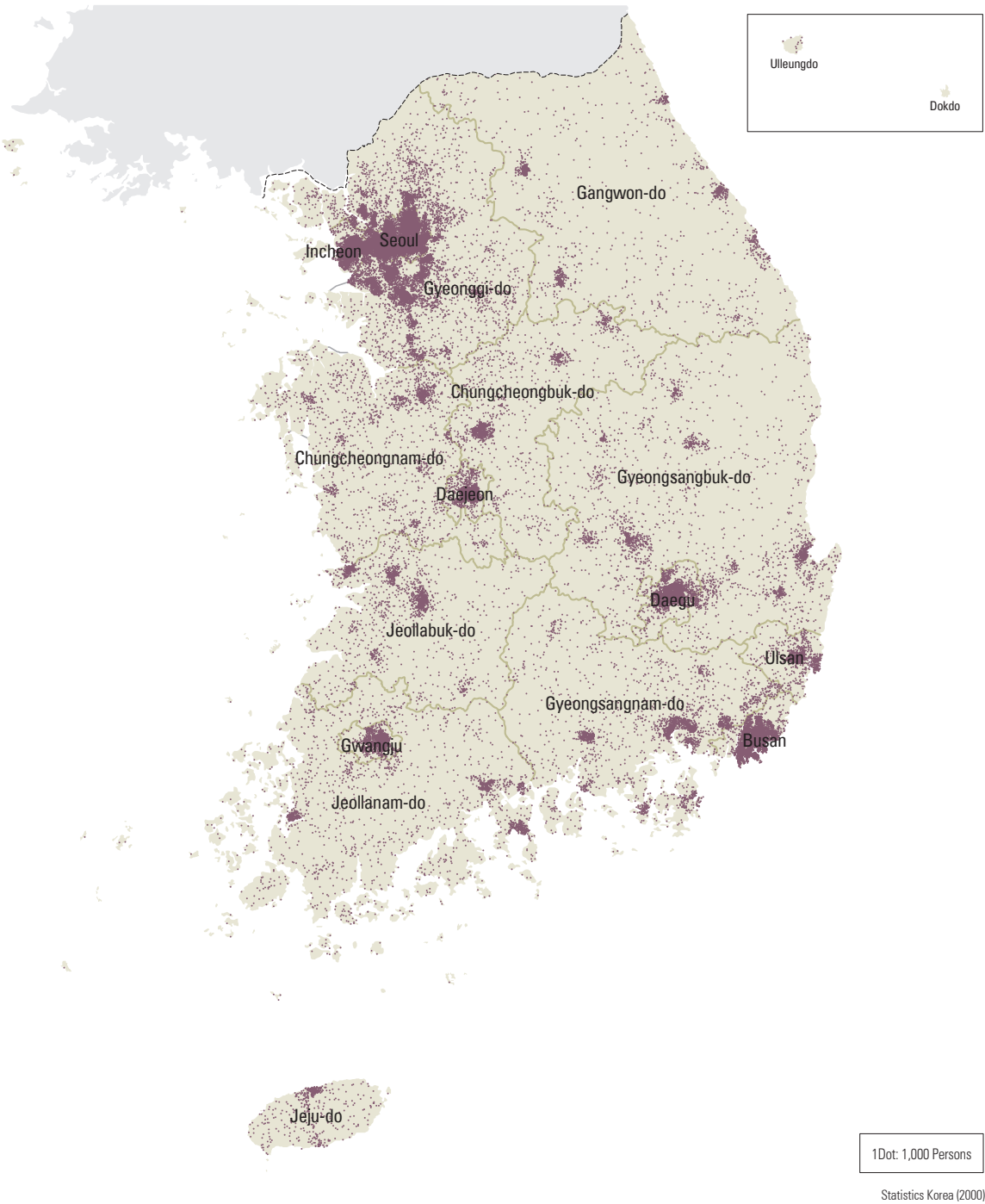
1980



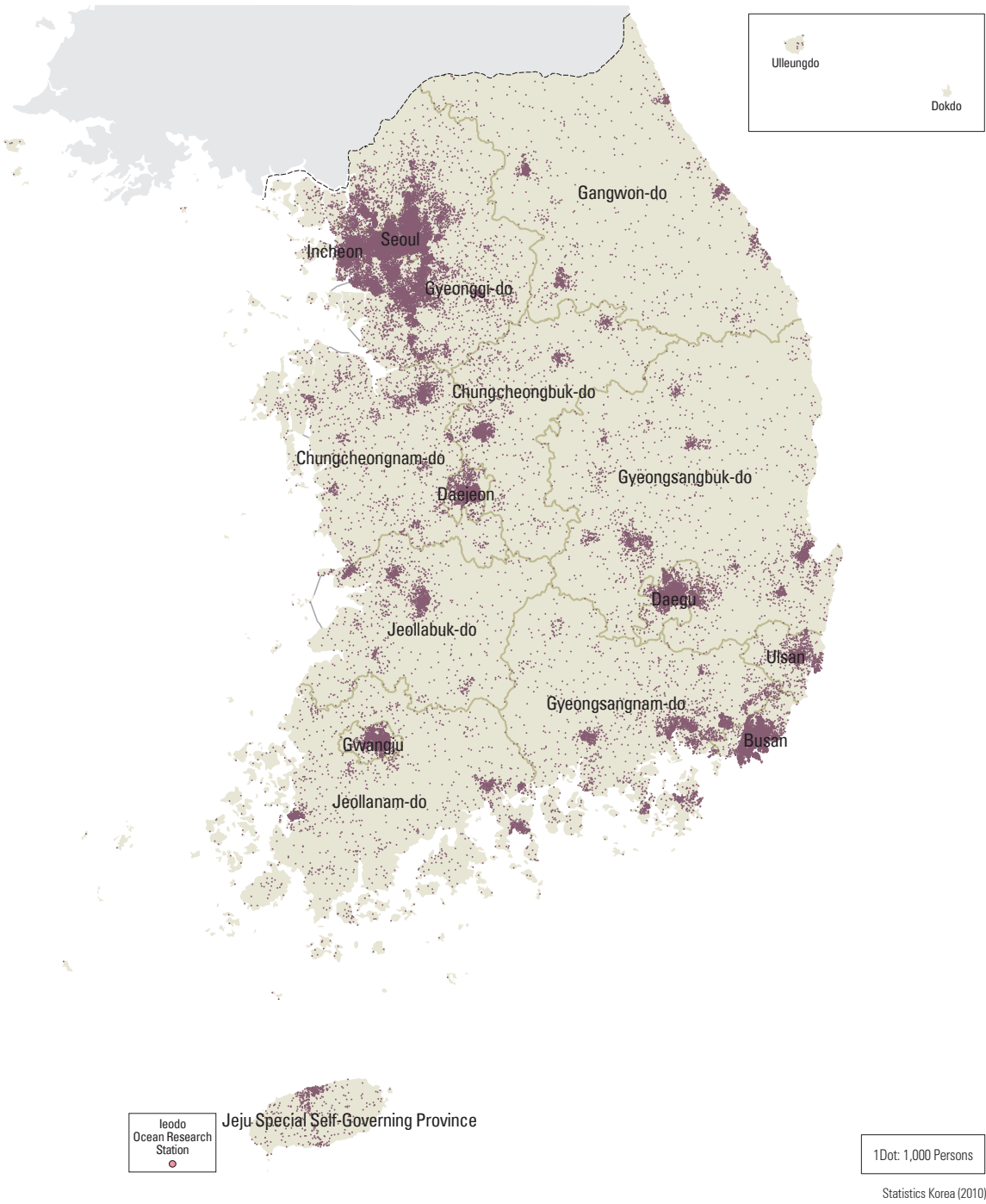
1990



2000

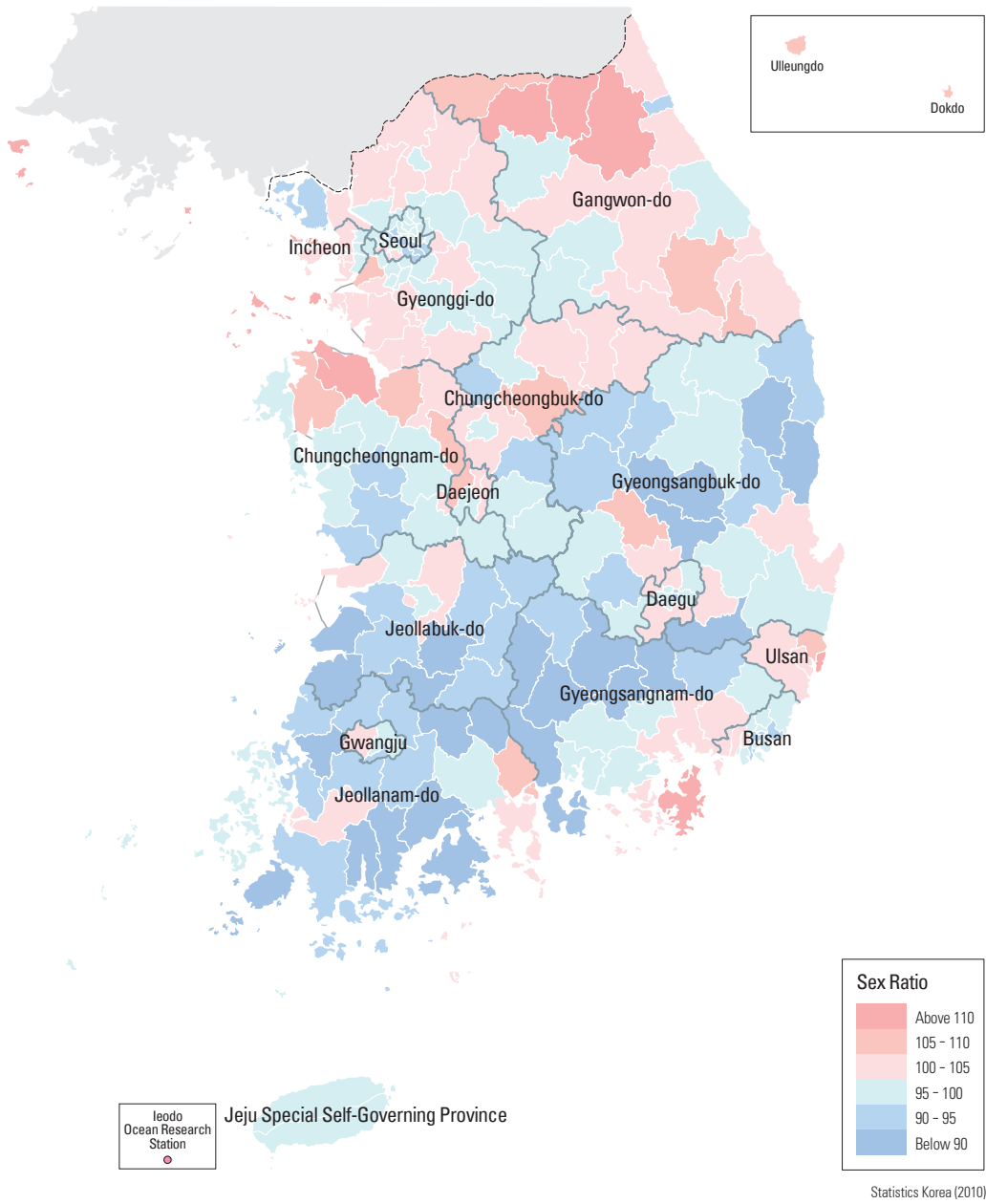


2010

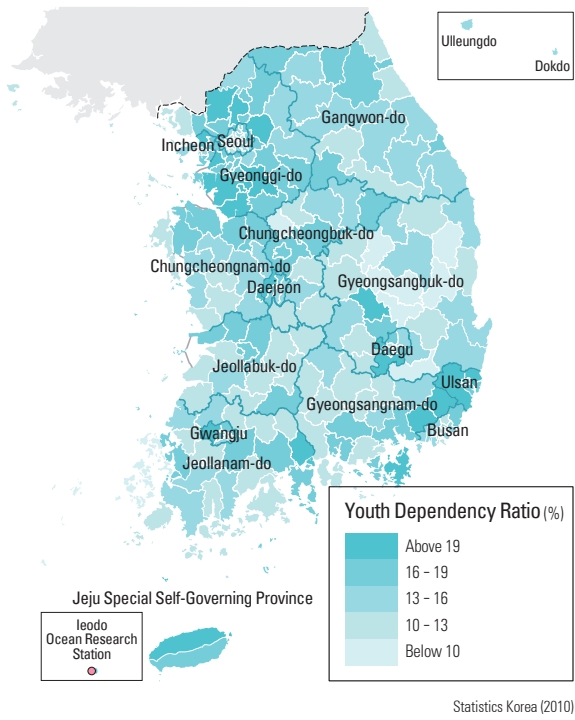


Population Structure

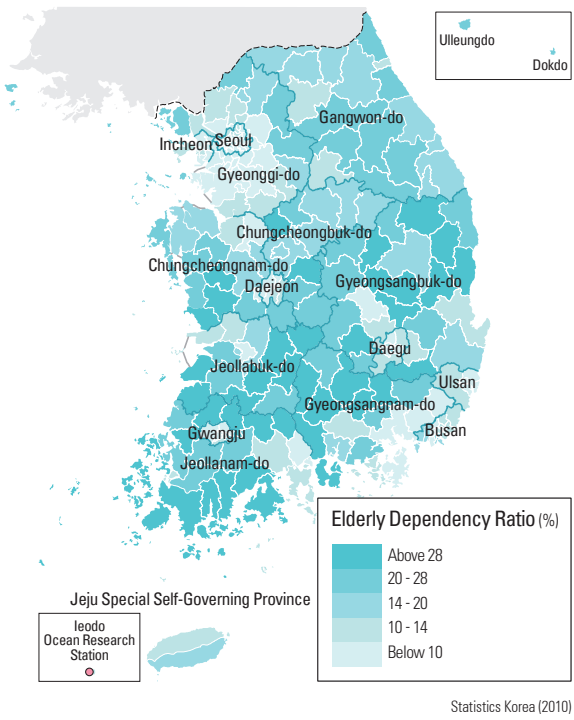
Sex Ratio



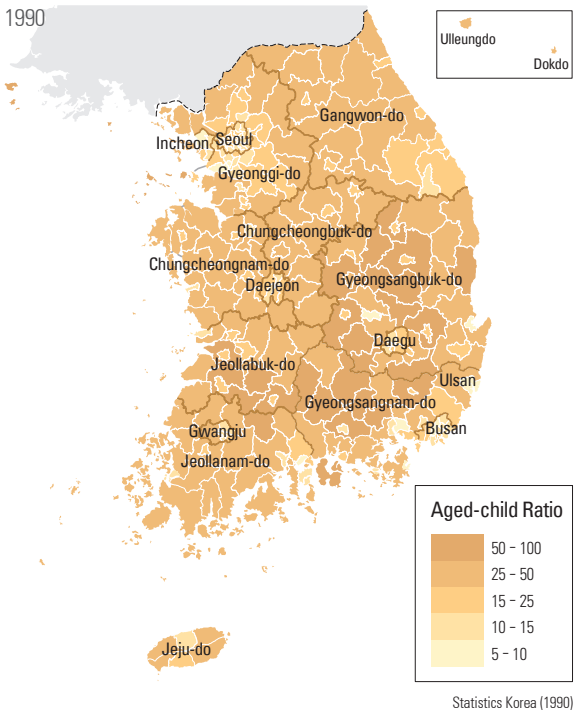
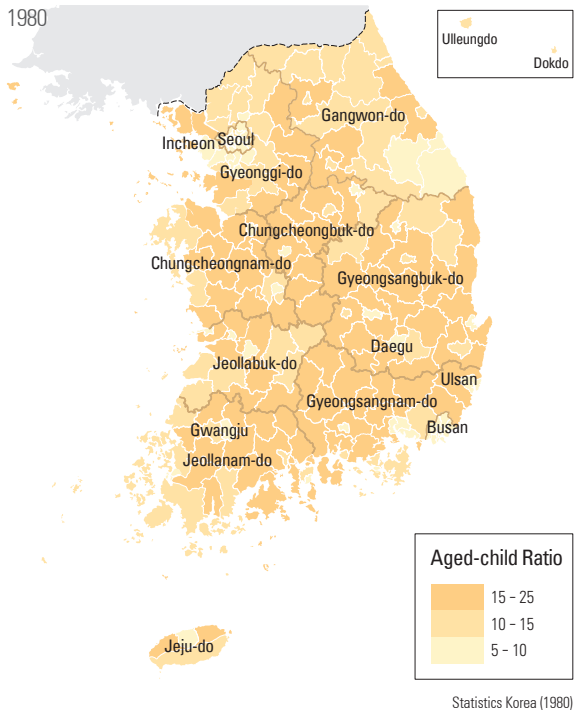
Youth Dependency Ratio



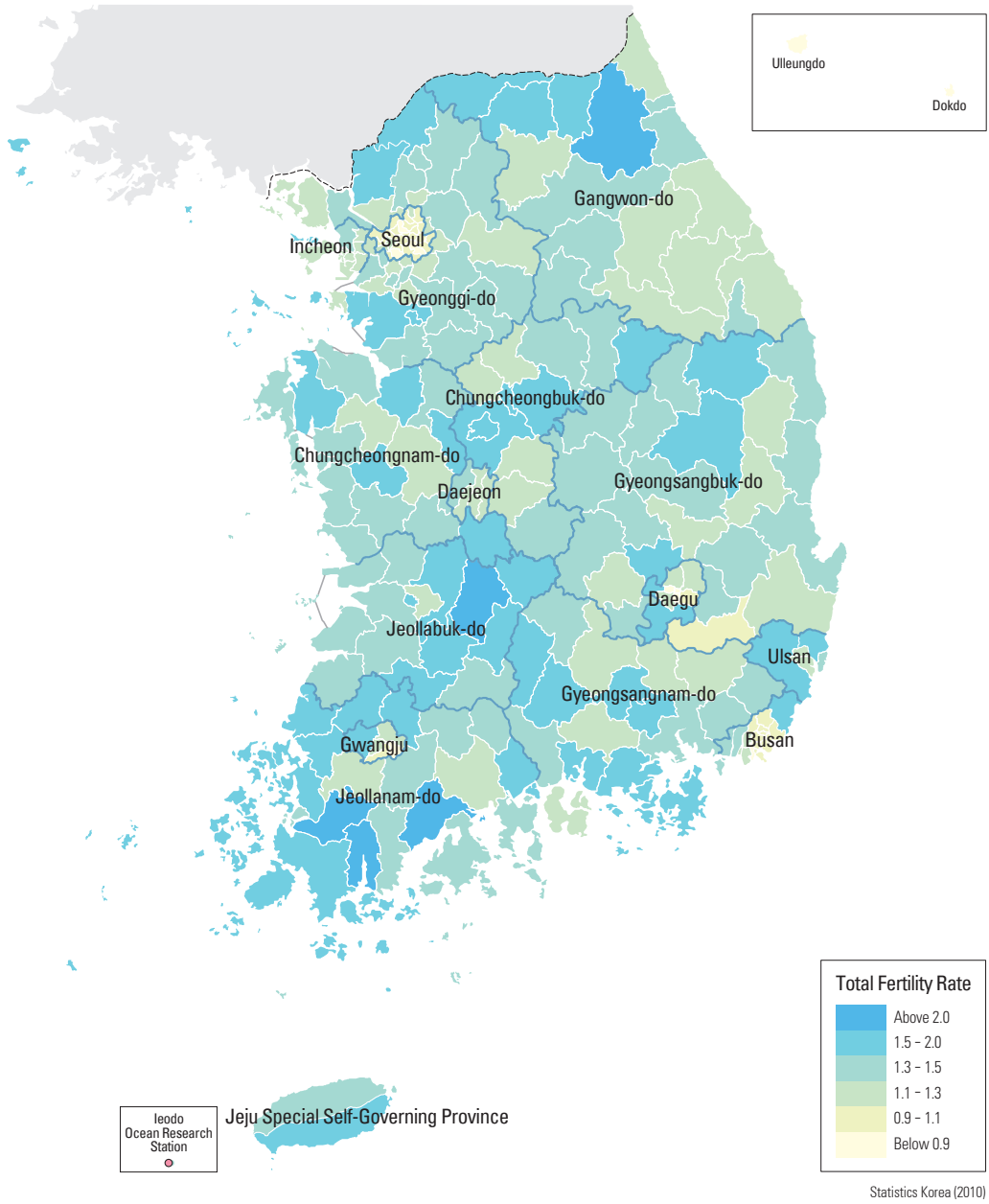
Elderly Dependency Ratio



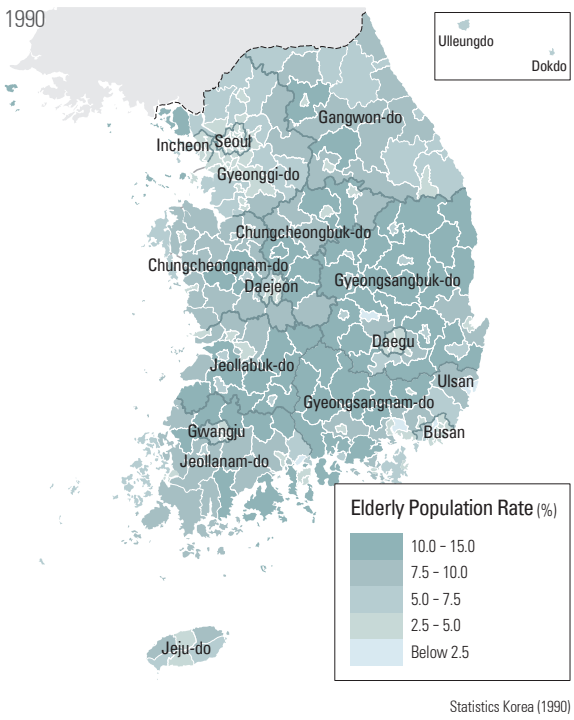
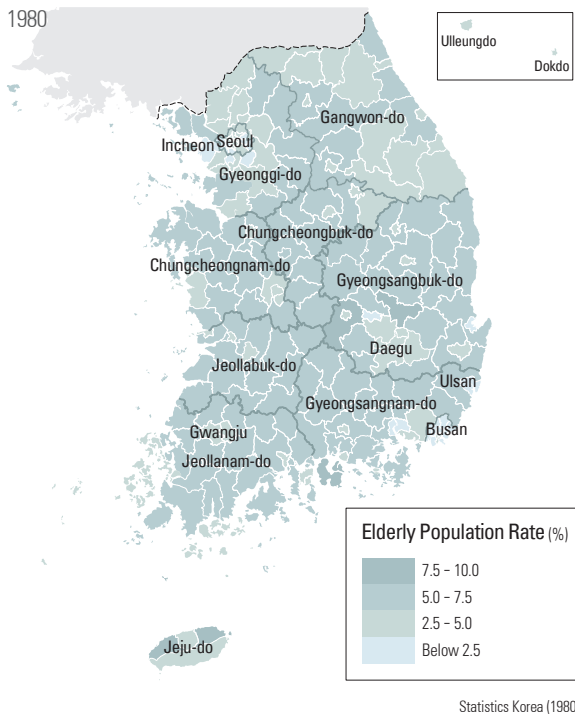
Aged-child Ratio



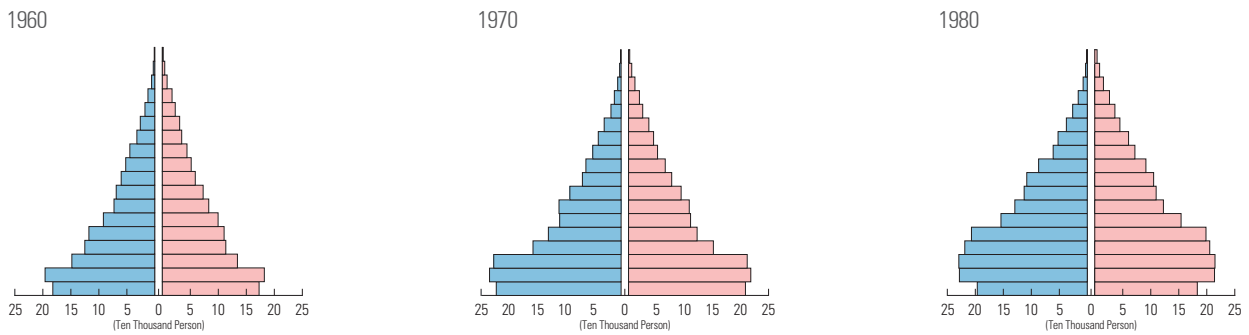
Total Fertility Rate (2010)



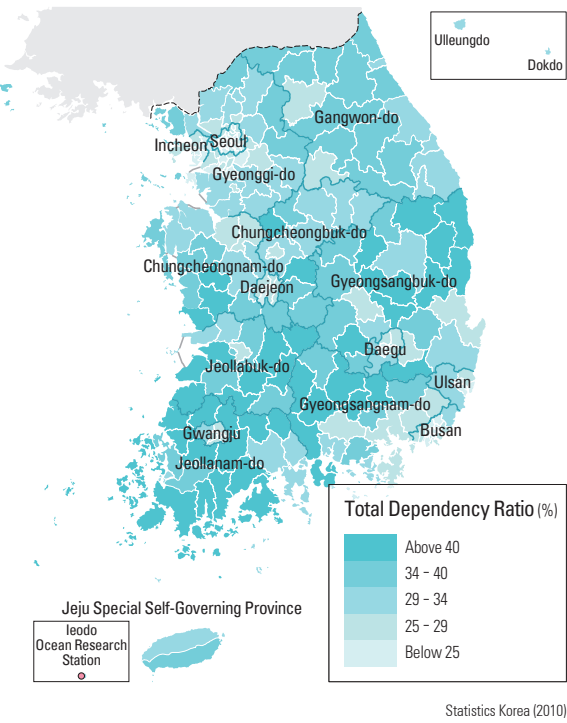
Elderly Population Rate



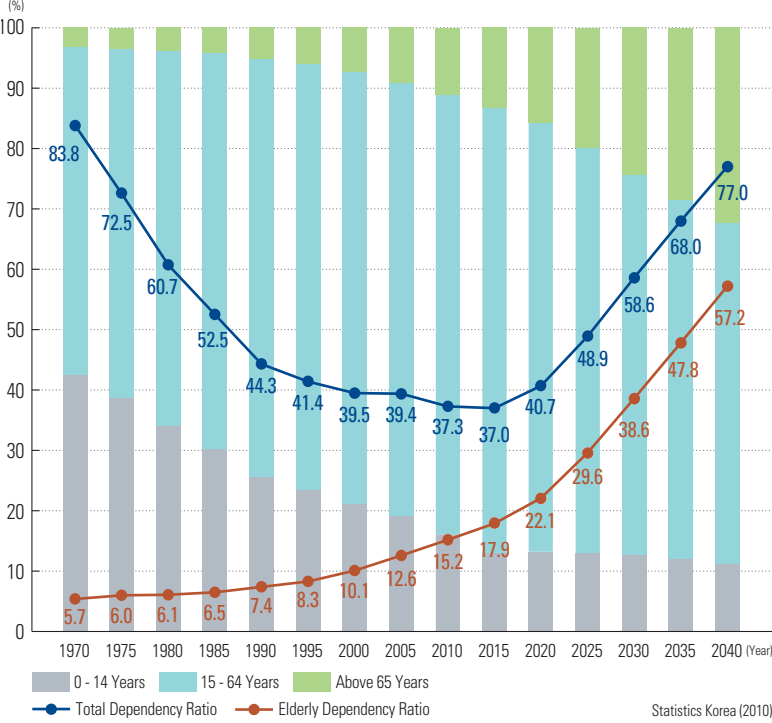
Change in Population Structure



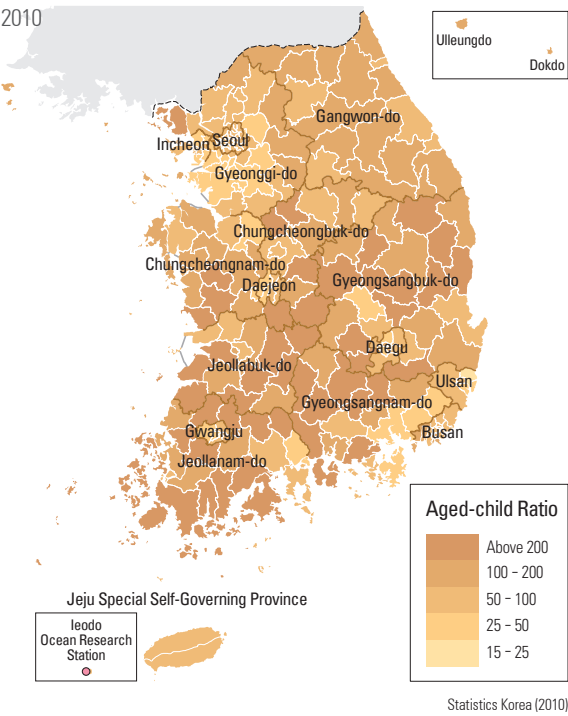
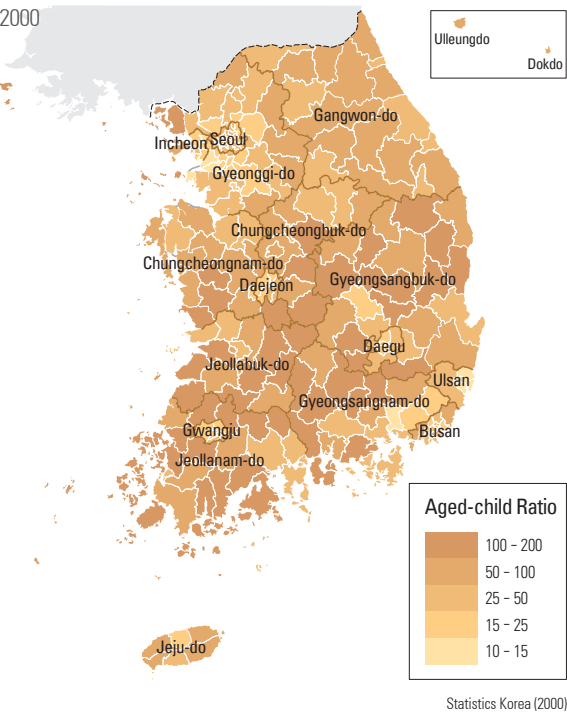
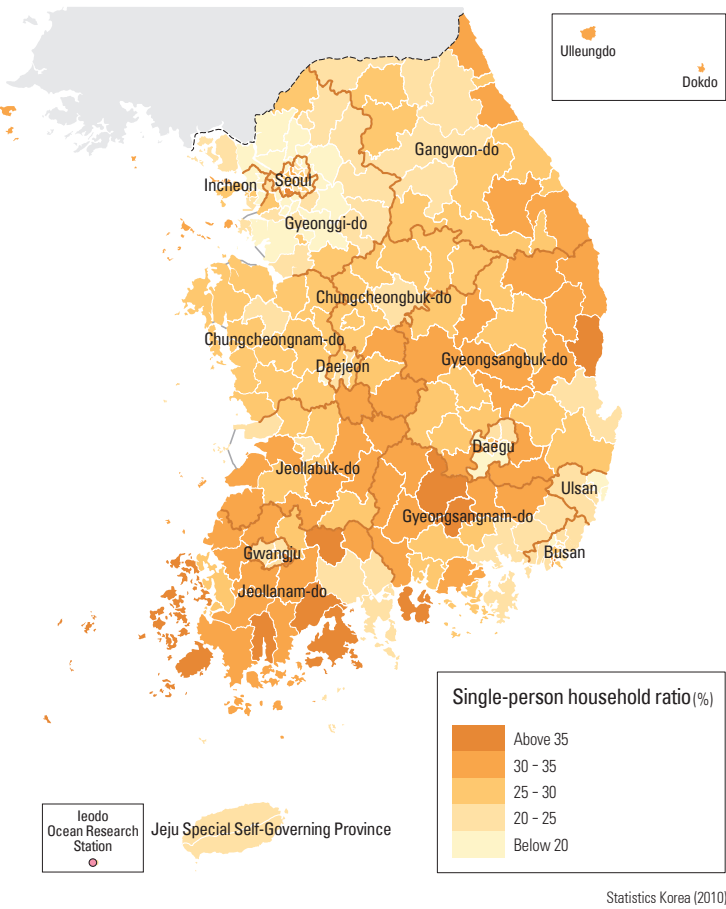
Total Dependency Ratio



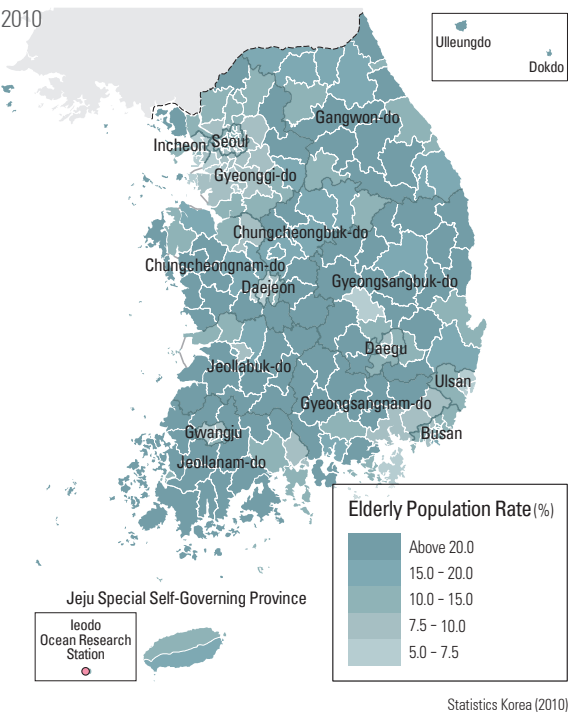
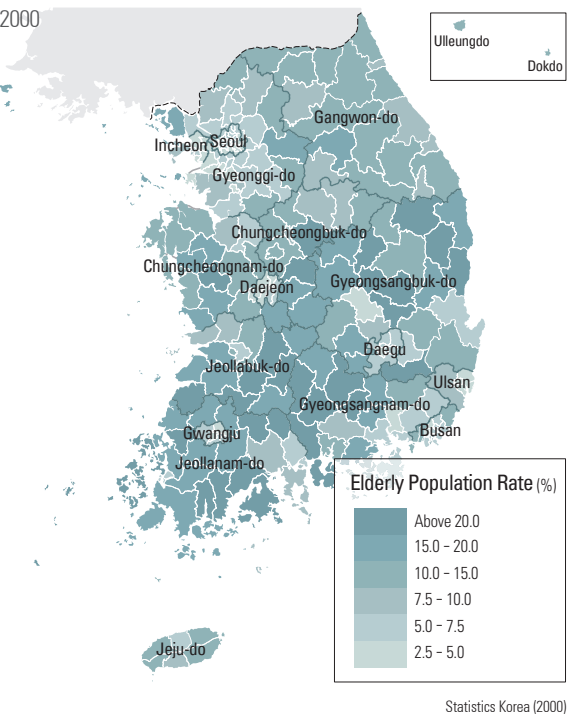
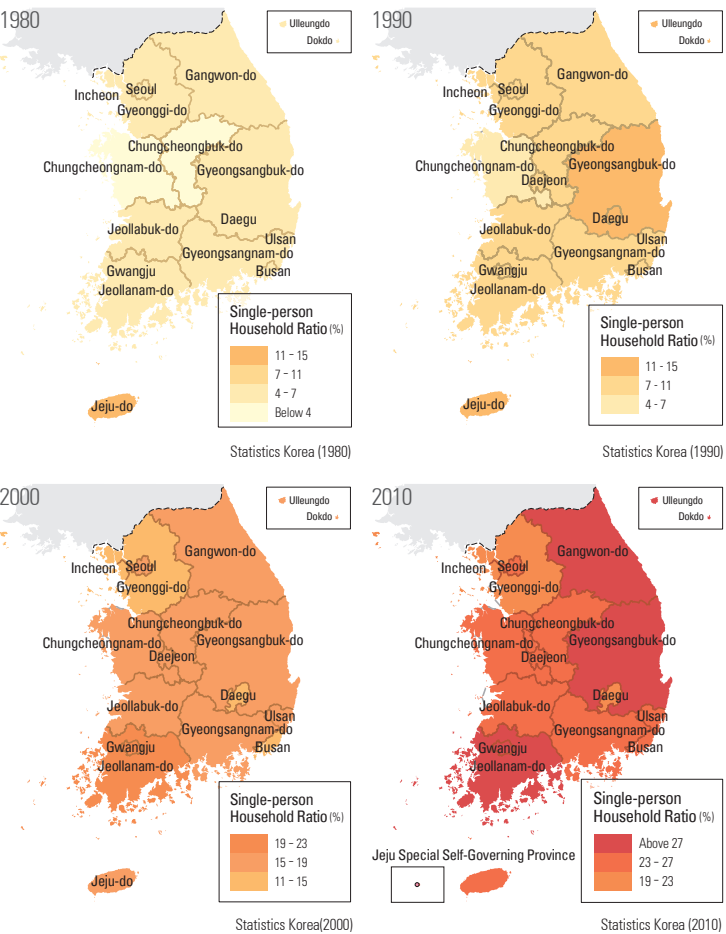
Dependency Rate of Population



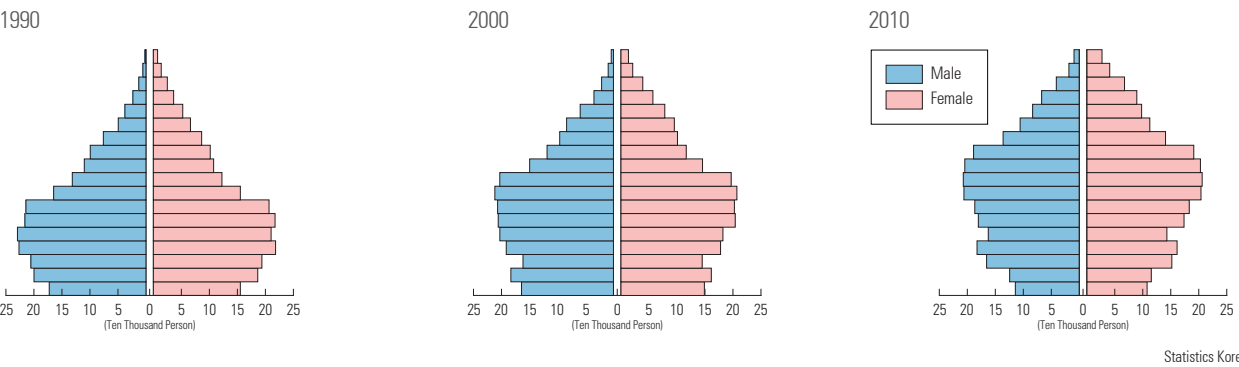
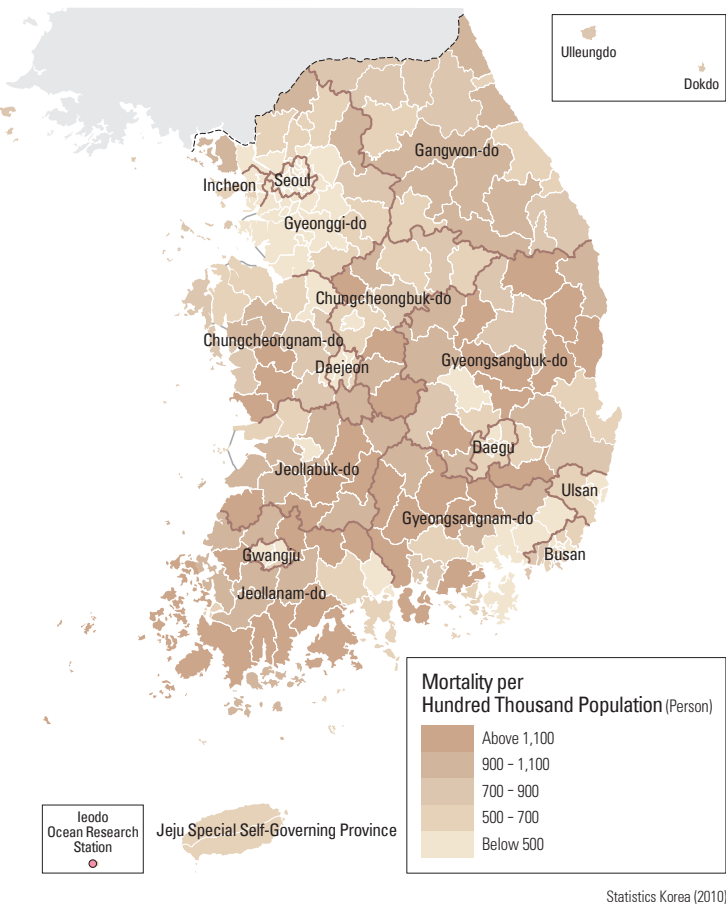
Single-person Household Ratio



Change in Single-person Household Ratio

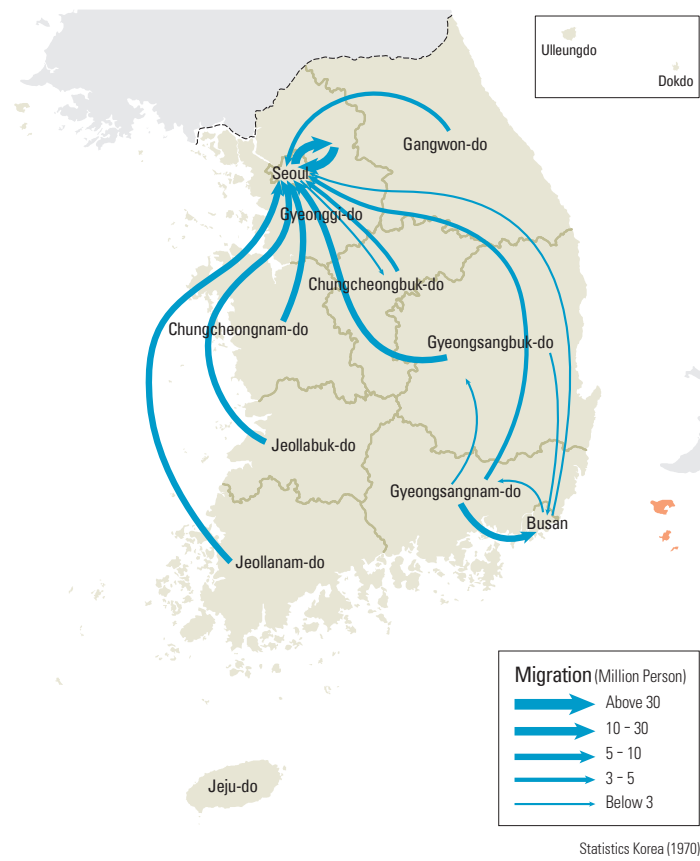


Mortality

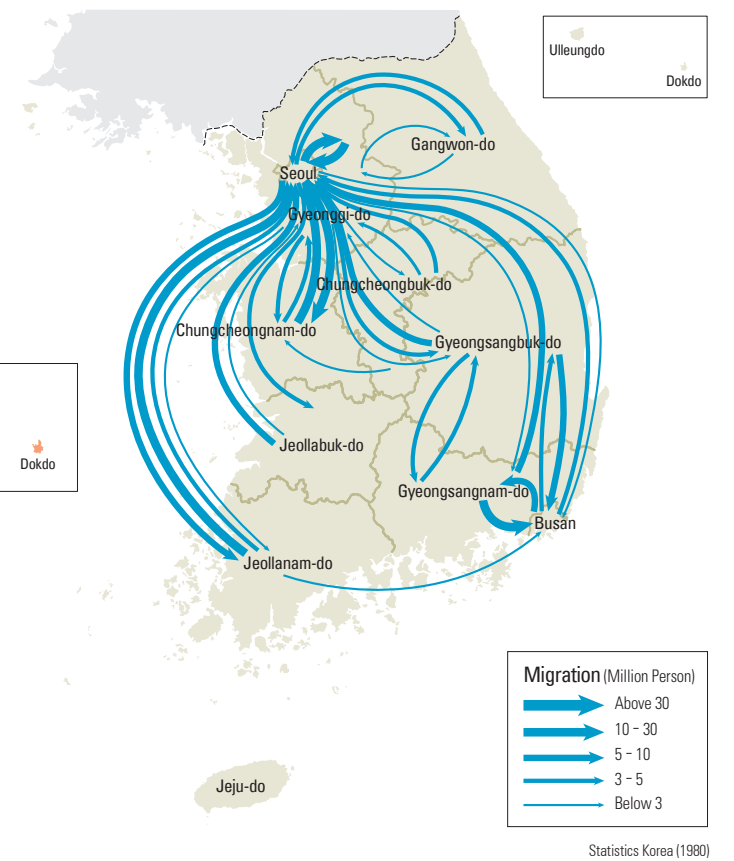


Migration

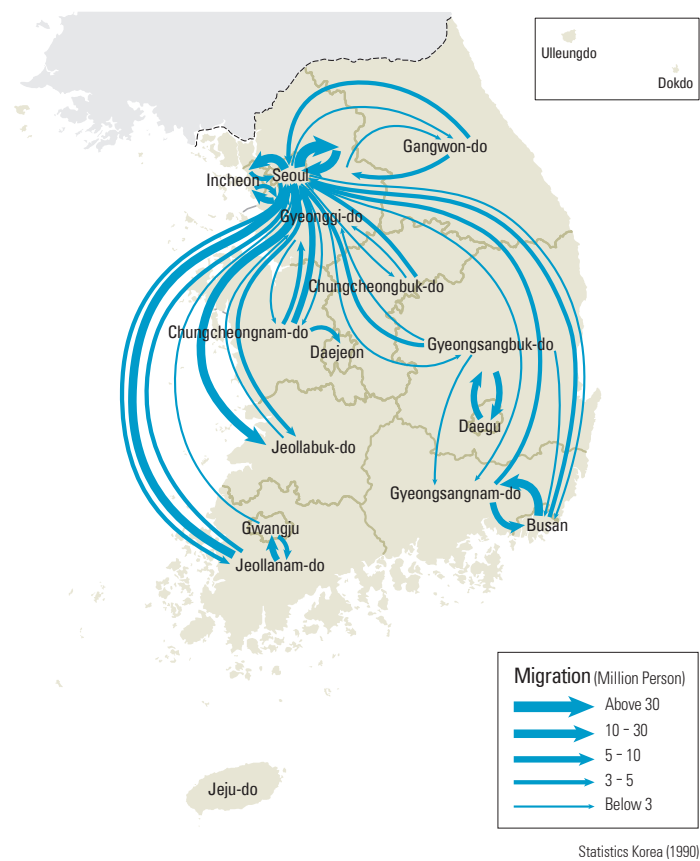
Migration (1970)



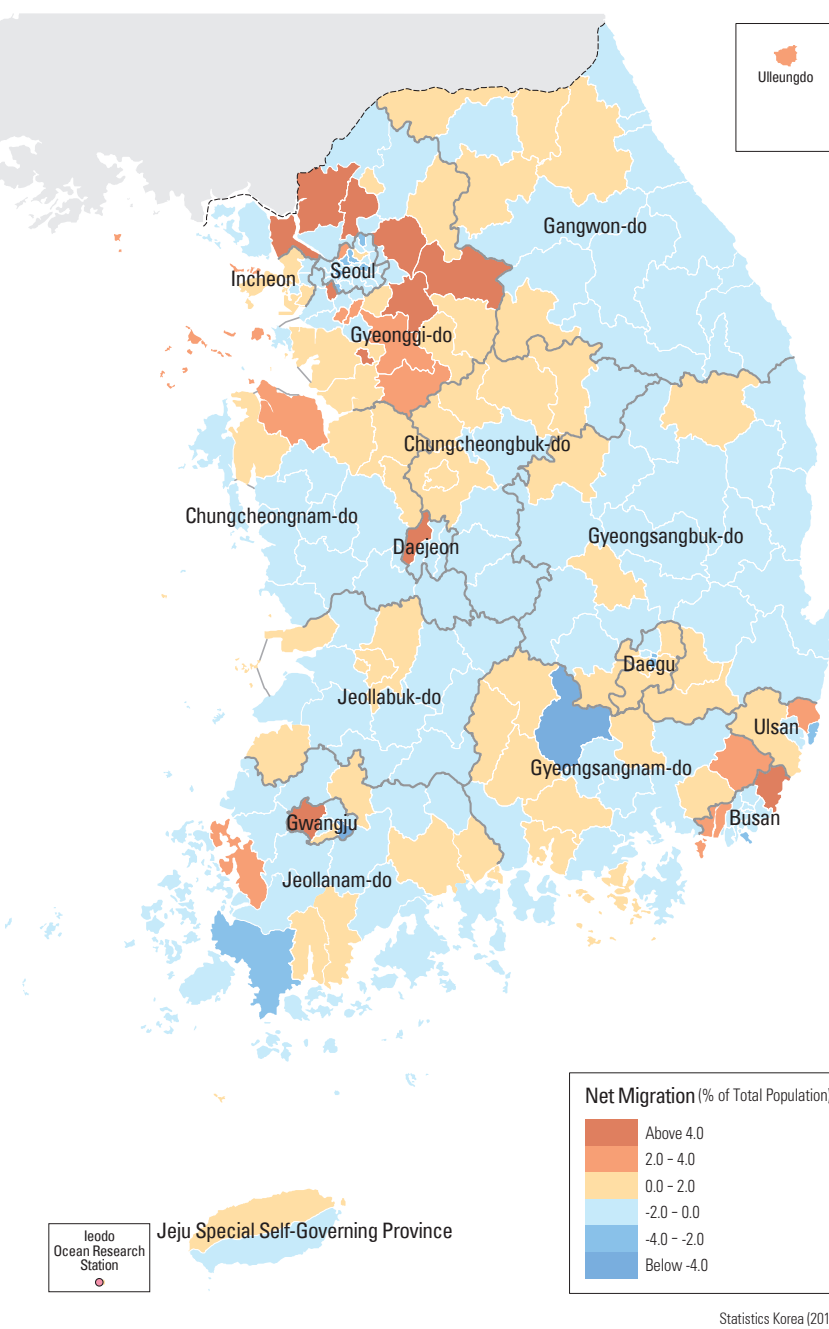
Migration (1980)



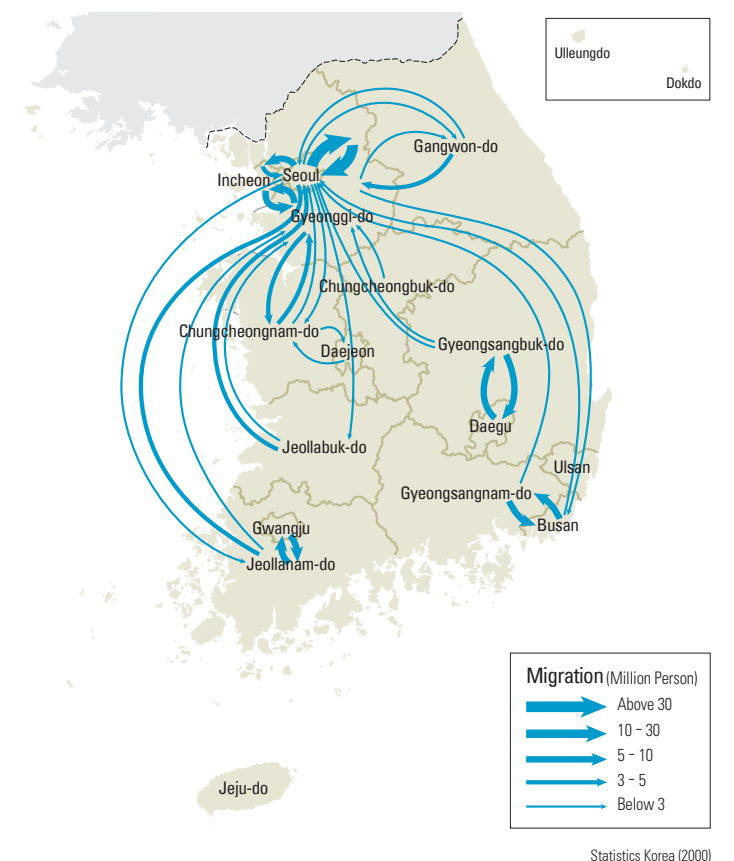
Migration (1990)



Net Migration (2010)



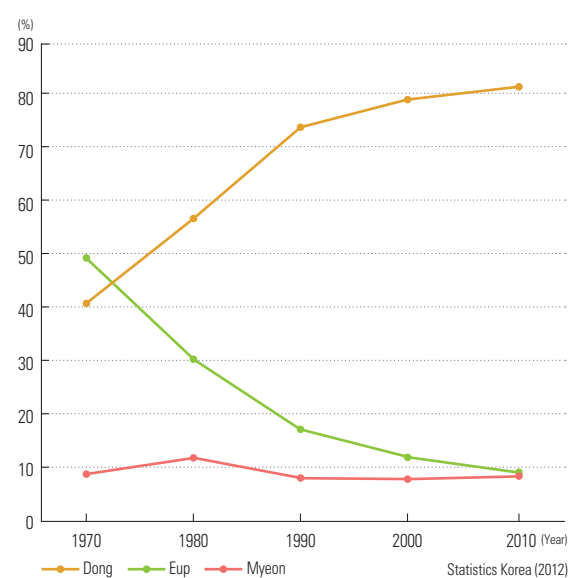
Migration (2000)



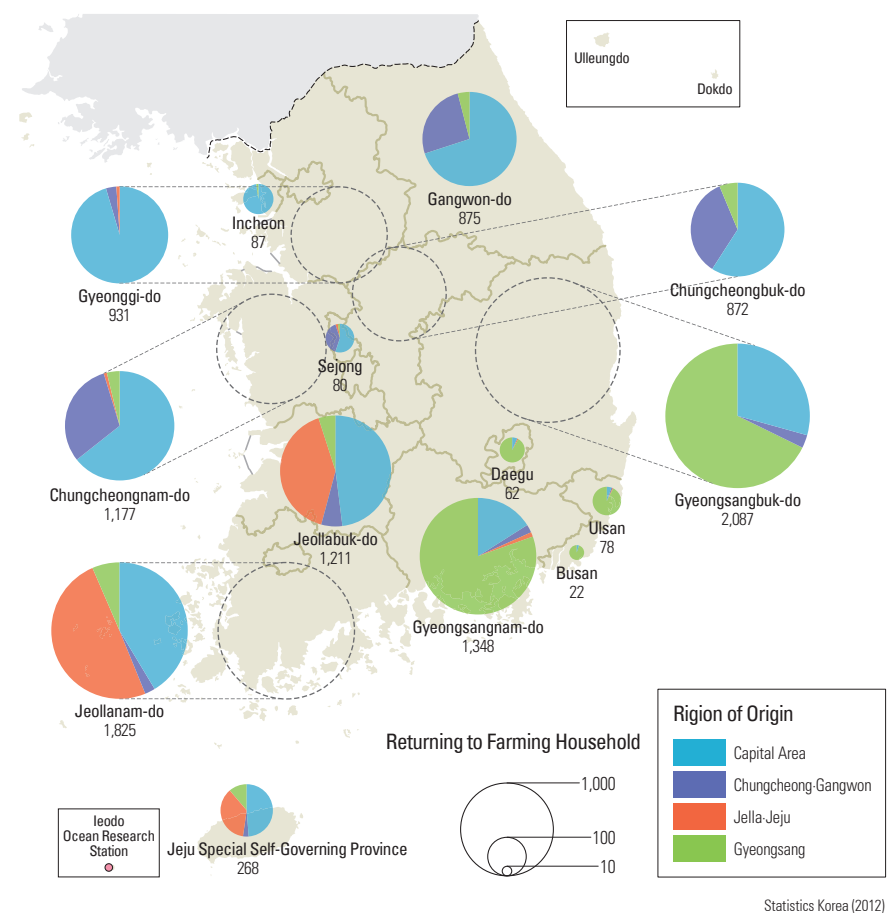
The observation of the nationwide population migration pattern in Korea shows that the size of migration increased rapidly from 1970 to 1980; this trend decreased a bit in 1990, and finally the absolute number of migrations has decreased since 2000. Since 1990 the data indicate that the population has settled down and become stabilized. The direction of migration, or origin and destination distributions, often reflects distance decay (a concept that the closer the destination from the origin, the higher the volume of migration and vice versa). The population migration patterns observed in Korea over the last half century reflects the characteristics of urbanization more than distance decay in the 1970s and 1980s. Distance decay characteristics became much more prominent from the 1990s onward. The suburbanization/counter-urbanization frequently appeared locally from 2000. Additionally, the percentage of the population returning to farming is on the increase due to retirement of the baby boomer generation. Many new retirees are

now heeding the call of local rural governments who are attempting to attract them to migrate to their territories.

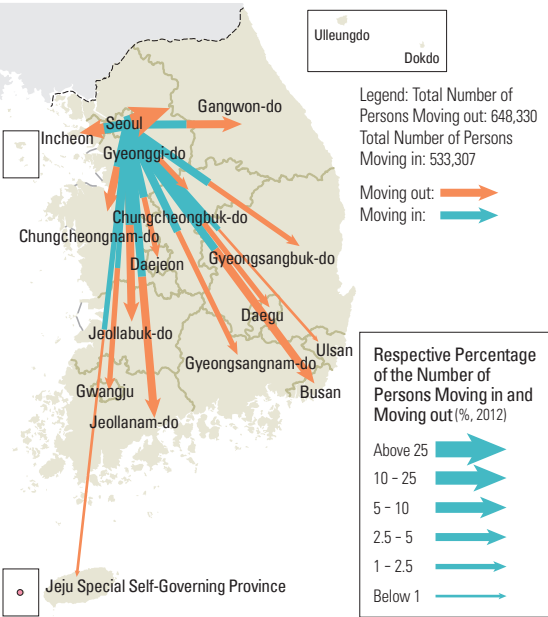
Change of Urban-Rural Population Share



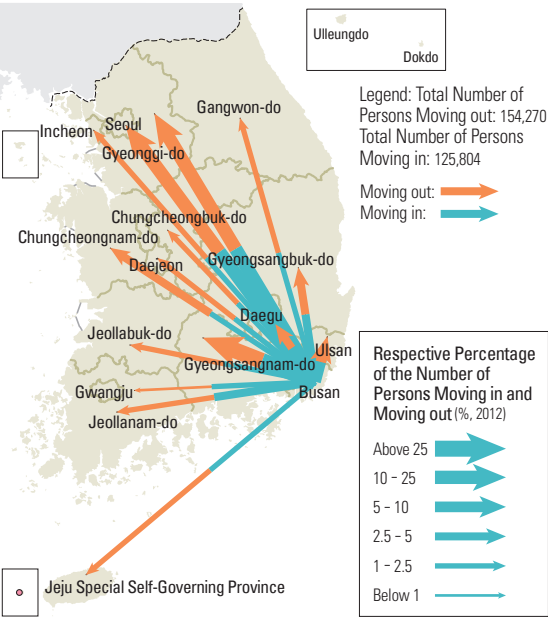
Number of People Returning to Farming



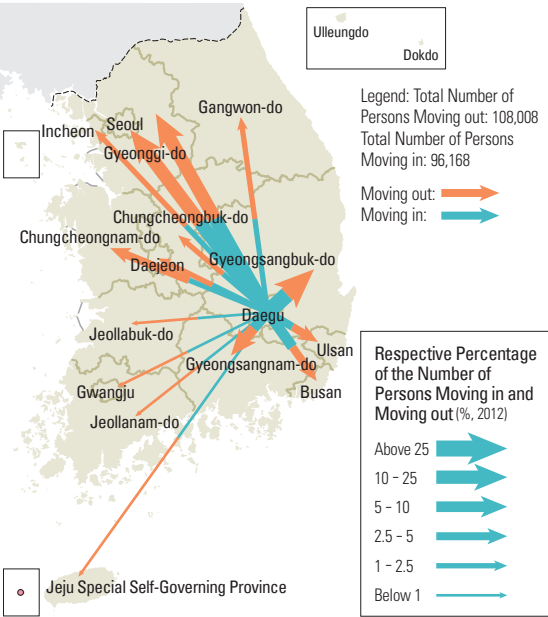
Seoul's Move in and Move out



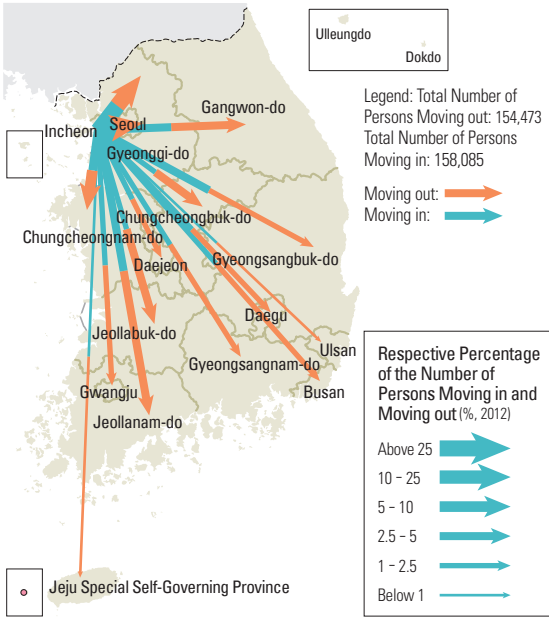
Busan's Move in and Move out



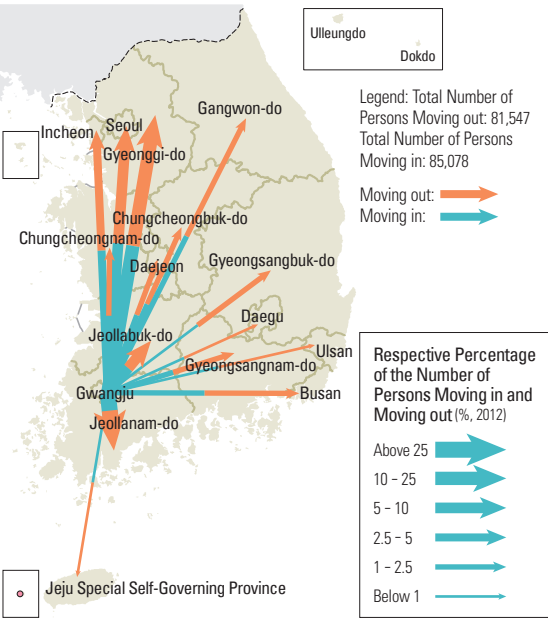
Daegu's Move in and Move out



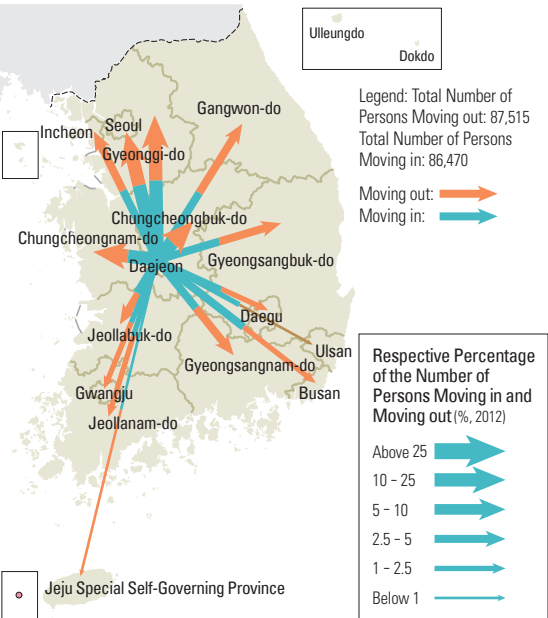
Incheon's Move in and Move out



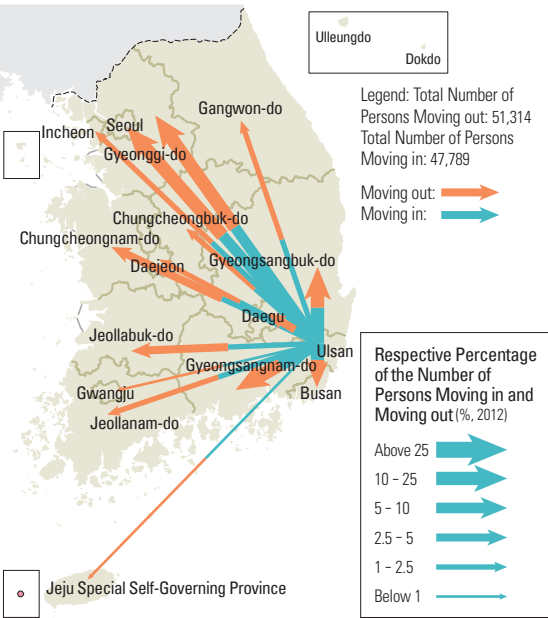
Gwangju's Move in and Move out



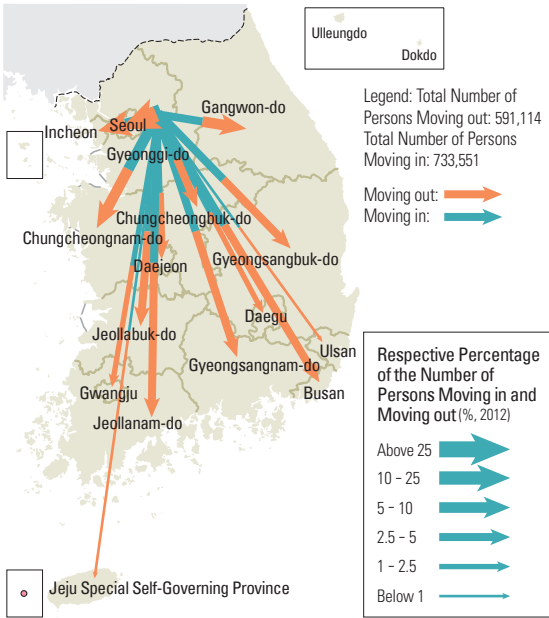
Daejeon's Move in and Move out



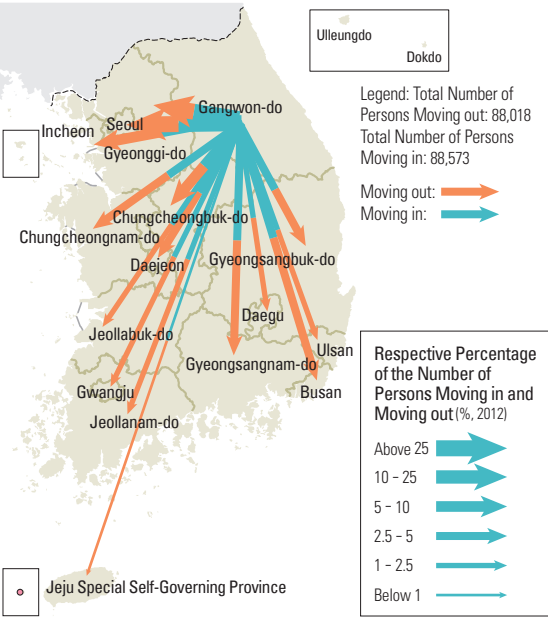
Ulsan's Move in and Move out



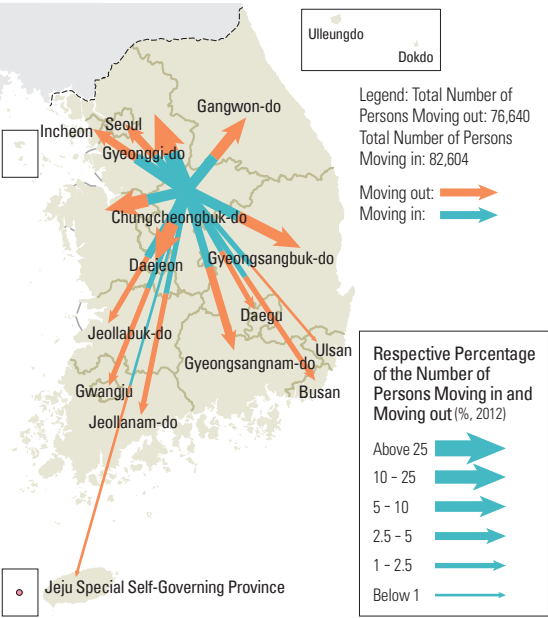
Gyeonggi-do's Move in and Move out



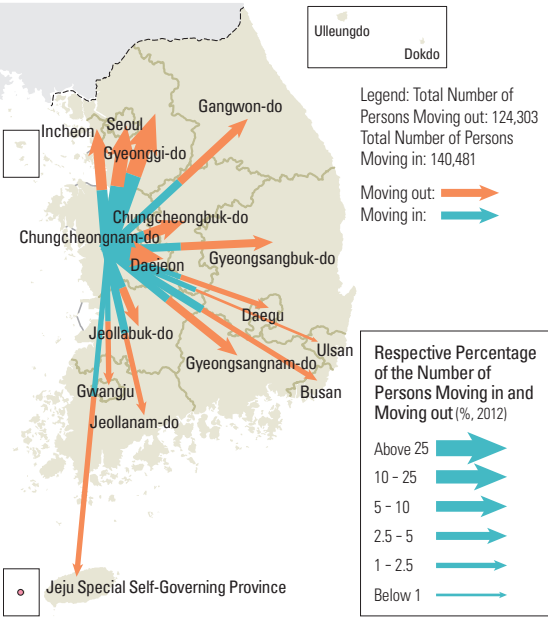
Gangwon-do's Move in and Move out



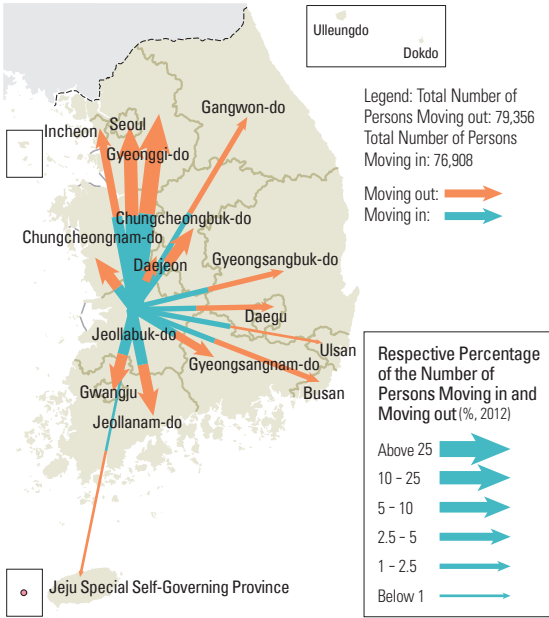
Chungcheongbuk-do's Move in and Move out



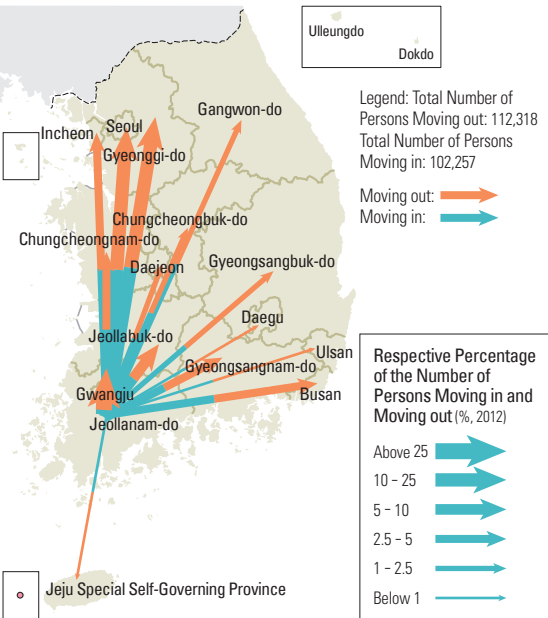
Chungcheongnam-do's Move in and Move out



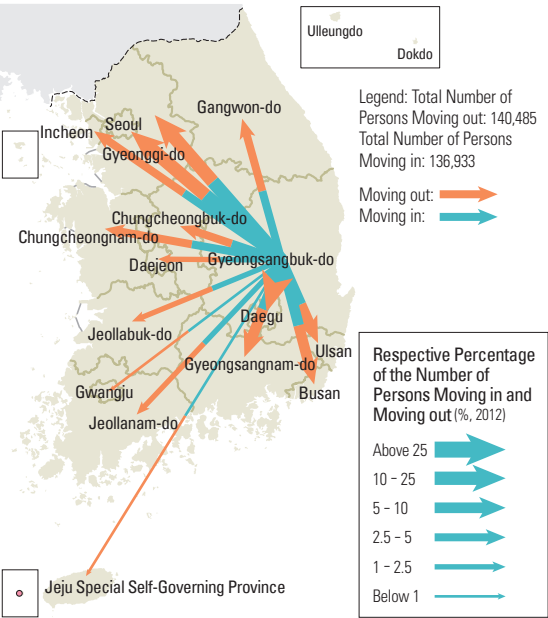
Jeollabuk-do's Move in and Move out



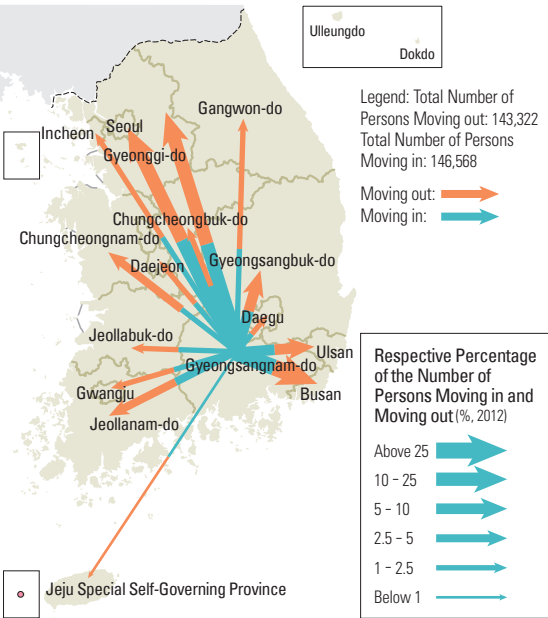
Jeollanam-do's Move in and Move out



Gyeongsangbuk-do's Move in and Move out



Gyeongsangnam-do's Move in and Move out



Jeju Special Self-Governing Province's Move in and Move out

