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This work has been created to serve as a foundational text for international readers to understand the geographic characteristics of the Korean Peninsula and the living culture of Koreans. It consists of an overview that presents a comprehensive look at the Korean Peninsula from a systematic geography perspective and a regional geography portion that examines specific regions of Korea in greater depth.

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Understanding Korea No. **7**

GEOGRAPHY OF KOREA

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Geography of Korea

Understanding Korea Series No. 7

Geography of Korea

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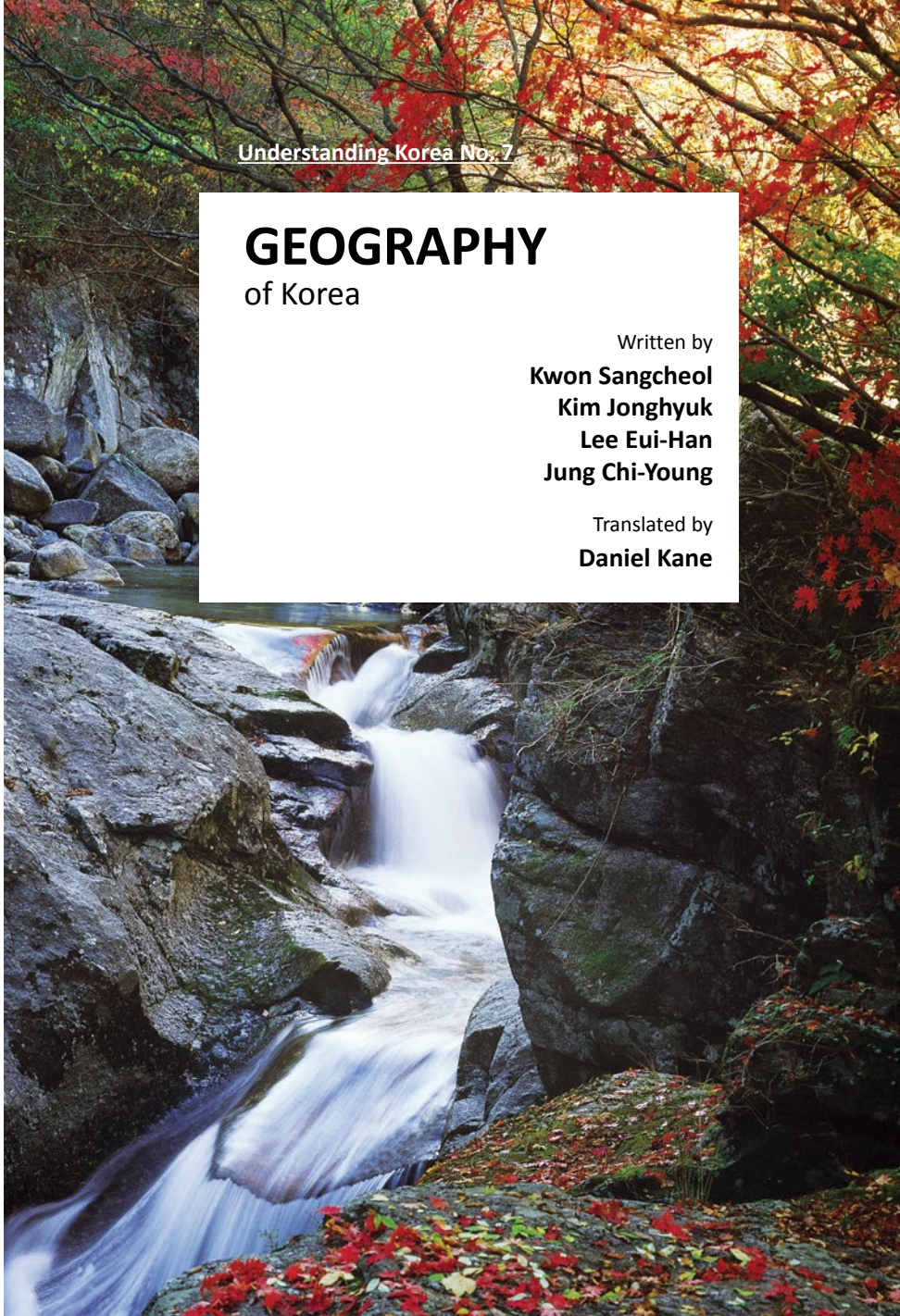


Understanding Korea No. 7

GEOGRAPHY
of Korea

Written by
Kwon Sangcheol
Kim Jonghyuk
Lee Eui-Han
Jung Chi-Young

Translated by
Daniel Kane

Contents

FOREWORD

Over the past four decades, the Academy of Korean Studies has taken the lead in promoting Korean studies, preserving Korea's history and culture, and nurturing successive generations of Korean studies scholars and their important research. As more universities and other organizations around the world have established Korean studies departments or begun offering individual Korean studies courses, there is growing demand for appropriate teaching materials. We have also become aware of the need for teaching materials that reflect accurate, extensive knowledge of Korea.

With this objective in mind, the Academy of Korean Studies has published the series Understanding Korea. It offers in-depth knowledge for students based outside Korea who are interested in Korean studies and who wish to gain a clear understanding of the field. The series covers a variety of Korea-related subjects, and we hope that it will be put into wide use around the world.

This seventh book in the Understanding Korea series, *Geography of Korea*, provides extensive information on Korea's natural and human environment; those who want to know more about Korea will find it very helpful in understanding Korea's geographical phenomena and Koreans' way of life. This book covers Korea's natural environment, its population and industries, and its urban and rural areas and discusses, from a comprehensive perspective, the causes of geographical phenomena and their impact on the lives of Koreans.

We deeply appreciate the solid efforts of Professor Jung Chi-Young of the Academy of Korean Studies, Professor Lee Eui-Han of Kangwon National University, Professor Kwon Sangcheol of Jeju National University, and Research Professor Kim Jonghyuk of Sungshin Women's University, without which the publication of this book would not have been possible. We also would like to express our gratitude to Kim Hyeon, director of the Center for International Affairs at the Academy, and to the other staff members who supported us in developing these important teaching materials on Korean studies for overseas students.

Lee Ki Dong
President, Academy of Korean Studies

INTRODUCTION

This work has been created to meet the needs of an international audience that lacks knowledge of Korea's natural and human environment—and, more specifically, to serve as a foundational text for international readers to understand the geographic characteristics of the Korean Peninsula and the living culture of Koreans.

Geography is the scholarly study of the geographic phenomena and popular modes of living of a given area based on a researched knowledge of that area's natural and human characteristics. As a field of study, geography may be categorized according to research methodology and scope into systematic geography and regional geography. Systematic geography derives general theories from the systematic study of the various elements that comprise an area. Accordingly, systematic geography may be subdivided into physical geography, which studies the natural physical phenomena of an area, and human geography, which concerns itself with the study of an area's human population and its attendant features and characteristics. By contrast, regional geography is a comprehensive study of the unique natural and human features of a specific region, and thus this field can be subdivided according to how one divides and classifies different geographical regions.

Because this current volume takes a comprehensive look at a particular region, it may be categorized as a work of regional geography. However, as a way of reflecting in greater depth upon the systematic geographical research of the book's first half, this work was divided into two main parts. We determined that this configuration would best allow us to present a comprehensive geography of Korea that encompasses the natural and social sciences as well as the humanities, and to produce a geography that examines phenomena from a comprehensive perspective.

Organizationally, this study consists of an overview (Part I) that presents a comprehensive look at the Korean Peninsula from a systematic geography perspective and a regional geography portion (Part II) that examines specific regions of Korea in greater depth. The overview primarily covers aspects of Korea's natural environment, such as its physical setting, territorial boundaries, climate, and topographical features, as well as its population and industry, urban spaces, and village and rural communities. Here, rather than offering up piecemeal descriptions of all these aspects, the approach was to present a comprehensive look at the factors shaping Korea's geographic features from a human perspective in order to paint an organic picture of geography's influence on the lives of Koreans. The regional geography portion encompasses both South and North Korea. Here we eschewed what one might call an encyclopedic approach of enumerating information in favor of highlighting and explaining the unique natural environments and cultural features, and imparting the regionalities of Korea's various regions in a manner easily understood by an international readership. To this end, we consulted in the production of this work the latest scholarship and research on Korea's geography, while also incorporating visuals such as maps, tables, and images to assist the understanding of the reader in their journey into Korean geography.

Four geography scholars, each with a different area of expertise, were involved in the writing of this work. In Part I, the first section, "Korea's Natural Environment," is the work of Lee Eui-Han, while the second section, "Population and Living Space," is co-authored by Jung Chi-Young, who authored the portions on population and villages and rural communities, and Kwon Sangcheol, who authored the portion on urban spaces. Kwon Sangcheol was also the author of Part I's third section on production and consumer space. Kim Jonghyuk is the author of Part II, "Regional

Geography." In consideration of our targeted international readership, for the most part not composed of geography experts, we the authors made every effort to avoid specialized jargon in our writing and to organize and present the topics in an easily understandable way, though we recognize our efforts must fall short in some instances for which we apologize in advance. The immensity of the subject that is Korean geography precludes it from being covered comprehensively in this small volume. For this work's errors and shortcomings the authors take full responsibility.

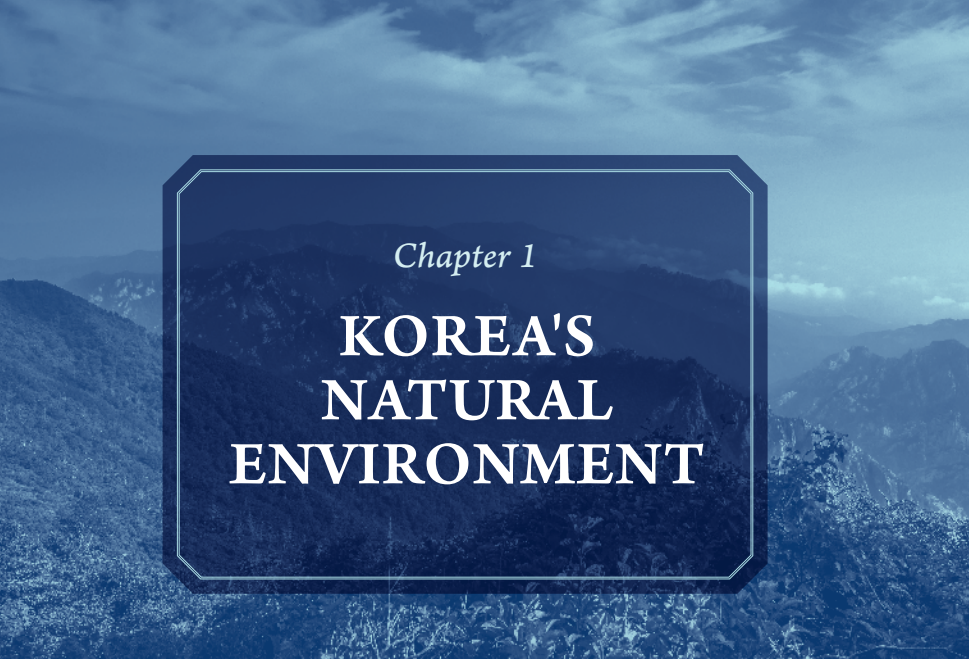
In closing, we note that this work is the fruit of a research project by the Center for International Affairs at the Academy of Korean Studies. We would like to express our sincere gratitude to Director Kim Hyeon and all the officials of the Center for International Affairs who made this book possible. Our special thanks as well to Daniel Kane for the excellent translation, to Seoul Selection editors for cleaning up and polishing the text, and to the team at Geo Dream preparing the maps used in this book.

On behalf of the authors,
Jung Chi-Young
November 2016

Map of Korea

Part I

SYSTEMATIC GEOGRAPHY



Chapter 1

KOREA'S NATURAL ENVIRONMENT

Geographical Position and Area

Geographical Position

The Korean Peninsula sits 33–43 degrees north latitude and 124–132 degrees east longitude. Its easternmost point, at 131°52′ east longitude, is the island of Dokdo, administratively a part of the county of Ulleung-gun in the province of Gyeongsangbuk-do in South Korea; its westernmost point, at 124°11′ east longitude, is the island of Maando, which belongs to the administrative district Sindo-eup within Sindo-gun in the province of Pyeonganbuk-do in North Korea. Sitting at 33°06′ north latitude, Korea's southernmost point is the island of Marado, part of Daejeong-eup within the city of Seogwipo on Jejudo Island, officially the Jeju Special Self-Governing

Province. The Korean Peninsula's northernmost point is Pungseo-ri, Yupo-myeon, in the county of Onseong-gun in the North Korean province of Hamgyeongbuk-do, which sits at 43°00′ north latitude.

Situated as it is in the middle latitudes of the northern hemisphere, Korea experiences four distinct seasons and has both temperate and subarctic climates. Relative to other regions at similar latitudes, the Korean Peninsula experiences greater seasonal temperature fluctuations. This can be attributed to the peninsula's location between continental Asia and the Pacific Ocean.

The longitudinal midpoint of the peninsula is the meridian 127˚30′ east longitude. In 1954, the Republic of Korea (or South Korea) set its standard time accordingly, putting South Korea eight and a half hours ahead of Greenwich Mean Time. However, in 1961 Korea's standard time was synchronized with that of Japan, which has the meridian 135˚ east longitude as its midpoint; Korea thus remains nine hours ahead of Greenwich.

The Korean Peninsula has long served as a conduit connecting the people of Japan with the rest of the Asian continent. As a result, the Korean people have since early times been receptive to cultural and material influences from the Chinese mainland and have played a bridging role by passing these influences on to Japan. At the same time, for Korea, it has also meant a long and continuous history of pressures and geopolitical challenges from both directions.

Area

National territory or area consists of the legally recognized land, air, and sea space belonging to a sovereign state, though in landlocked

states such as Switzerland, Austria, Chad, Mongolia, Bolivia, and a few others, national territory consists only of land and airspace.

Stretching about 1,100 kilometers north to south, and including the 3,400 or so islands scattered off its coasts, the Korean Peninsula's territory covers about 220,000 square kilometers, about 100,000 of which belongs to the Republic of Korea. In terms of area, the entire Korean Peninsula is similar to Cambodia, Yemen, the United Kingdom, Romania, Uganda, Ecuador, or Uruguay. South Korea, however, is more comparable to Austria, Hungary, Iceland, Bulgaria, Portugal, Cuba, Guatemala, or Honduras. Among the approximately two hundred states in the world, if taken together, North and South Korea combined would rank about eightieth in area.

As of this writing, land reclamation efforts continue along South Korea's southern and western coasts, so the country's area is incrementally increasing. In 1960, the total area of South Korea was 98,430 square kilometers. By 2000, this had become 99,461 square kilometers, and by 2010 it was 100,033 square kilometers—an increase of 1,600 square kilometers over fifty years.

From east to west, the Korean Peninsula spans about 300 kilometers. When measured from north to south, from Onseong-gun in the North Korean province Hamgyeongbuk-do to Haenam-gun in South Korea's Jeollanam-do, it is about 1,070 kilometers long. The peninsula's elongated north-to-south formation, and the resulting climatic variations, have been major factors in the development of different lifestyles in the northern and southern regions.

As with other countries, South Korea's territorial waters are determined from a baseline called the "territorial sea baseline." A country's territorial waters are those waters extending outward for 12 nautical miles from this territorial sea baseline, which can be determined either by what's termed a "normal baseline" or by a "straight baseline." A normal baseline is calculated based on the coastline at low tide, a methodology usually applied to coasts (such as Korea's east coast) that are relatively straight. For coastlines that are very curvy or dotted with many islands, as is the case on Korea's western and southern shores, the straight baseline is used to establish the territorial waters. The straight baseline consists of a series of straight lines joining fixed points—the most outlying islands or landmasses. Since 1977, South Korea has declared its territorial waters as those extending out 12 nautical miles, and has determined its coastal waters as being those waters extending for 3 nautical miles from the outermost Korean island in the Korea Strait.

Today, exclusive economic zones are as important as territorial waters. Such zones extend for 200 nautical miles (about 370 kilometers) from a country's coast. The coastal state exercises exclusive rights over the resources contained within its exclusive economic zone. Following the Second World War, developing countries, which lacked marine development technology, attempted to expand the definition of territorial waters; conversely, developed countries made efforts to narrow it. As a compromise, the international community recognized territorial waters as extending for 12 nautical miles from a country's coastal baseline, while that area extending out 200 nautical miles from the baseline was recognized as the exclusive economic zone of the coastal state.

A country's airspace refers to the air over a country's territorial

land and waters. A country's exclusive sovereignty extends just as much to this airspace as it does to its territorial waters. In theory, just as a country's territorial land includes control over all the mineral resources that lie beneath it, so would territorial airspace include control over all the air extending above it. In reality, however, airspace has certain limitations. These limitations have to do with the power of one country to shoot down the aircraft of another. Though ships passing through a country's territorial waters have what is called the "right of innocent passage," such a right does not extend to airspace. Thus, only in instances where a special agreement has been signed can aircraft from one country enter the airspace of another.

Topography

Tectonic and Seismic Shifts on the Korean Peninsula

Peninsular tectonics

About half of the Korean Peninsula consists of stable metamorphic rock formed during the pre-Paleozoic Precambrian period. Metamorphic rock is widely distributed throughout various massifs, including the Hambuk, Gyeonggi, and Sobaek Massifs (Figure 1-1). The Korean Peninsula's massifs (*yukgoe* [陸塊] in Korean) began to develop about six hundred million years ago at the start of the Paleozoic period. Among the peninsula's metamorphic rocks, some have been found to date back about 2.7 to 2.9 million years. This seems to indicate that, although its appearance would have been completely different at the time, the Korean Peninsula was already in existence during the Paleozoic period and before.

The Hambuk Massif, which partially encompasses Hamgyeongbuk-do in North Korea, and the Pyeongbuk Massif, which covers the entire North Korean province of Pyeonganbuk-do and portions of Hamgyeongnam-do, consist of large areas of granite gneiss rock, part of China's Liaodong land block. Between the Hambuk and Pyeongbuk Massifs is the Macheollyeong Mountain Range. Because it forms a belt of sedimentary Precambrian rocks, in geological terms it is also called the Macheollyeong Geosyncline. However, the term "Nangnim land block" is sometimes used to refer collectively to the area encompassing the Hambuk Massif, the Pyeongbuk Massif, and the Macheollyeong Geosyncline.

The Gyeonggi Massif, which occupies much of the Korean Peninsula's middle section, is composed of metamorphic gneiss complex and granite, standing in contrast to the nearby Shandong Massif in China. The Sobaek Massif, which stretches from northeast to southwest following the Sobaek Mountain Range, is made up of the gneiss complex of Mt. Taebaeksan and Mt. Jirisan, and is similar in geological makeup to the South China Massif.

The basin sitting between these ancient massifs was, during the Paleozoic period, covered by a rising sea, leaving an extensive lake and forming a layer of sedimentary rock upon a metamorphic foundation. The Pyeongan Basin, between the Gyeonggi and Pyeongbuk Massifs, is a sedimentary basin formed by a thick stacking of the metamorphic Sangwon Supergroup formed in the late Precambrian period, the Joseon Supergroup from the early Paleozoic period, and the Pyeongan Supergroup from the later Paleozoic and early Mesozoic periods. In its geological formation the Pyeongan Basin bears sim-

ilarities to the Yellow River basin in China.

The Okcheon Orogenic Belt and the Okcheon Metamorphic Belt, which are sandwiched between the Sobaek and Gyeonggi Massifs, were at one time considered collectively as the Okcheon Geosyncline. However, beginning in the 1970s they began to be recognized as two distinct geological features and each came to be known by its current name. The Okcheon Orogenic Belt is composed of the Joseon and Pyeongan Supergroups, while the Okcheon Metamorphic Belt is composed of low-grade metamorphic rock from the Okcheon Supergroup, whose dating is not clear.

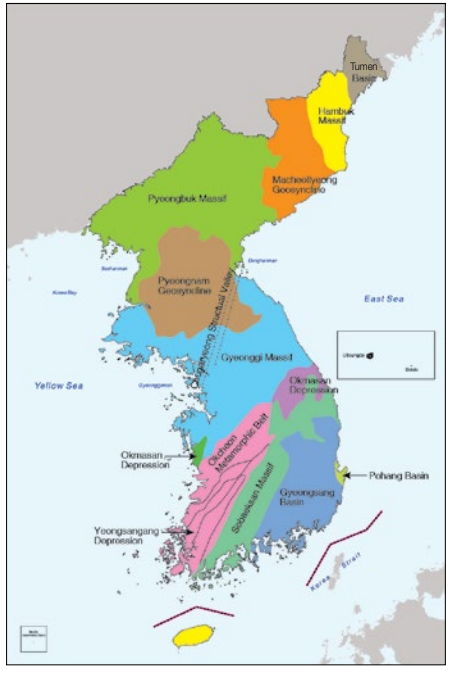


Figure 1-1 Tectonics of the Korean Peninsula

Because the Joseon Supergroup lower sedimentary layer of the Pyeongan Basin and the Okcheon Orogenic Belt consists of limestone, its area of distribution has given rise both to karst topography and to the cement industry. However, the Pyeongan Supergroup, which makes up the basin's upper sedimentary layer, is composed of

sandstone and shale along with buried anthracite, which make the area one of the peninsula's most important coal deposits.

The Gyeongsang Supergroup, which dates back to the Cretaceous period, is distributed throughout the Gyeongsang Basin, located in the southeastern Sobaek Massif. Formed by sedimentary deposits from an extensive lake, the Gyeongsang Supergroup is composed of the following materials, from the bottom: the Sindong Group, a fluvial deposit layer with a psephite core; the Hayang Group, a lacustrine deposit with a sandstone and shale core; and the Yucheon Group, effusive rocks such as volcanic tuff and andesite layered by an aqueous sedimentary layer. Interpenetrating all of these strata are deposits of Bulguksa granite. However, the generally igneous Yucheon Group is not limited to the Gyeongsang Basin, but is scattered relatively widely through the southern part of the peninsula in the Jeolla and Chungcheong provinces, and is often found in mountains due to its resistance to erosion.

There are also smaller-scale sedimentary basins. The Tumen Basin and Yeongsangang River basin's Yeongsan Depression, the northernmost basins on the peninsula, date to the end of the Paleozoic era. Additionally, the Ongmasan Depression, located in Korea's western coastal region in Chungcheongnam-do, is a stratum from the Mesozoic, while the Tumen Basin at the lower reaches of the Tumen River and the Pohang Basin are deposits from the Tertiary period of the Cenozoic era.

Cataclysmic changes on the Korean Peninsula

Geologically, the Korean Peninsula has enjoyed relative stability

and experienced few geological cataclysms; those that did occur were primarily concentrated in the Mesozoic period (see Table 1-1). The early Mesozoic Triassic period's orogeny, the so-called Songnim Disturbance, mainly affected the northern part of the peninsula, creating the Pyeongan Basin and folding the strata there. The result was a severe disturbance in the Pyeongan Supergroup and the discontinuous appearance of anthracite.

The Daebo Orogeny, coming at the end of the Jurassic period, was the most powerful cataclysmic disturbance in Korea's geological history, diastrophically affecting the entire peninsula. This event brought about a major disturbance in the existing strata of the peninsula, including the massive influx of so-called Daebo granite. There are fundamental differences between the geotectonic events on the Korean Peninsula prior to and after the late Jurassic period. The peninsula's strata during and prior to the Jurassic period underwent severe geothermic changes—being folded and experiencing reverse faults, for instance—whereas, after the Jurassic, these strata experienced almost no diastrophic disturbances. The Bulguksa Disturbance occurred from the end of the Cretaceous period to the early Tertiary period of the Cenozoic era; centered on the Yeongnam region in southeastern Korea, it entailed some minor folding of strata and the influx of Bulkguksa granite. In contrast to the Daebo granite, which can be found widely distributed throughout the peninsula, Bulguksa granite is limited to the Yeongnam region in the peninsula's southeast.

Following the Bulguksa Disturbance there were no major geotectonic upheavals to speak of. However, from the middle of the

Table 1-1 Geological history of the Korean Peninsula

	Geological Age	Geological System	Cataclysmic, Volanic Activity, Etc.
Cenozoic	Quaternary	Quaternary System	Volcanic activity (basalt)
	Tertiary	Tertiary System	Bulguksa Disturbance - Bulguksa granite
Mesozoic	Cretaceous	Gyeongsang Supergroup	Daebo Orogeny - Daebo granite
	Jurassic	Daedong Supergroup	Songnim Disturbance
	Triassic	Pyeongan Supergroup	
Paleozoic	Permian		
	Carboniferous		Sea transgression
	Devonian	(Strata Free Period)	
	Silurian		
	Ordovician		Epeirogenic movements
	Cambrian	Joseon Supergroup	Sea transgression
Precambrian	Proterozoic	Yeoncheon Supergroup Chuncheon Supergroup Sobaeksan Metamorphic Complex	Regional metamorphism (granite gneiss)
	Archeozoic	Gyeonggi Metamorphic Complex	

Cenozoic era the asymmetrical Yogok Disturbance along the axes of the Taebaek and Hamgyeong Mountain Ranges began its gradual movement, a disturbance that continues to this day. The Yogok Disturbance, which has worked to shift these ridge axes toward the East Sea, has had a profound influence on the topography and configuration of the Korean Peninsula.

Beginning in the Quaternary period of the Cenozoic era, volcanic activity became widespread. This volcanic activity centered

on Mt. Baekdusan, and after forming a relatively expansive lava plateau the activity extended southward along the Macheollyeong Mountain Range, linking Mt. Chilbosan, Ulleungdo Island, and Jejudo Island in a sort of volcanic crescent, now termed the "Korean crescent" (Hangukho). It also formed the Cheorwon-Pyeonggang (Gangwon-do) and Singye-Goksan (Hwanghae-do) lava plateaus.

Mountainous Terrain of the Korean Peninsula

GYEONGDONGSEONG TOPOGRAPHY AND MOUNTAIN RANGES

The topography of the Korean Peninsula is characterized by the so-called "*gyeongdongseong*" ("inclining nature"), which is its defining feature. As its name implies, this *gyeongdongseong* topography is characterized by fault action resulting in a terrain that inclines in one direction, producing steep and relatively uniform sloping on one side and asymmetrical but mild sloping on the other. Representative examples of this are the north–south Taebaek and Nangnim Mountain Ranges and the Hamgyeong Mountain Range, which stretches from northeast to southwest (see Figure 1-2).

Along the north–south axis formed by the Taebaek and Nangnim Mountain Ranges, the eastern slopes are precipitous, while the western slopes are asymmetrical and relatively mild. The major rivers originating in the Taebaek and Nangnim Mountain Ranges, such as the Cheongcheongang, Daedonggang, Imjingang, and Hangang Rivers, follow the gradual slopes and flow westward to empty into the Yellow Sea. Similarly, the southeastern slope of the Hamgyeong Mountain Range is characterized by its steepness while its northwestern slope descends gradually into Manchuria. Some fairly

large rivers, such as the Jangjingang, Bujeongang, Heocheongang, and Seodusu Rivers originate in the Hamgyeong Mountain Range, flowing northward to empty into the Yalu (Amnokgang) and Tumen (Dumangang) Rivers.

The *gyeongdongseong*-style movements of the Korean Peninsula have also had a profound impact on the shape of its coastlines. The Taebaek and Hamgyeong Mountain Ranges, which comprise Korea's eastern coast, are characterized by the uniform abruptness of their uplifted topography, while the peninsula's western coast is generally characterized by its low terrain, a situation that has resulted in extreme tidal ranges and irregular shorelines. Because rivers that flow into the Yellow Sea have such extreme tidal ranges, they do not form deltas and their estuaries spread out like trumpets. The shape of these rivers' outlets is thus termed "*samgakgang*" (literally, "triangular river").

Besides the *gyeongdongseong* movements, it is worth pointing out the Macheollyeong and Sobaek Mountain Ranges for the large influence they have had on the peninsula's topography. The Macheollyeong Mountain Range begins at Mt. Baekdusan (2,744 m), Korea's highest mountain, and follows a direction from north-northwest to south-southeast to the eastern coastal city of Seongjin (now Gimchaek). This range, a string of towering peaks that includes Mt. Baekdusan, Mt. Bukpotaesan (2,389 m), Mt. Nampotaesan (2,435 m), Daeyeonjibong Peak (2,360 m), and Mt. Duryunsan (2,309 m), was formed by the volcanic activity along the Baekdu volcanic range.

The Sobaek Mountain Range originates around Mt. Taebaeksan

(1,567 m), where it divides from the Taebaek Mountain Range and continues in an east-northeast to south-southwest direction to the vicinity of Mt. Songnisan, where it turns and then progresses from a north-northeast to south-southwest direction. Because of the consistently high peaks of this range, which include Mt. Sobaeksan (1,439 m), Mt. Songnisan (1,058 m), Mt. Minjujisan (1,242 m), Mt. Deogyusan (1,614 m), and Mt. Jirisan (1,915 m), it effectively geographically separates the Yeongnam region (i.e., the two Gyeongsang provinces in the southwest corner of the peninsula) from the rest of the peninsula. The Sobaek Mountain Range's distinctness is believed to stem from its formation by tectonic movements.

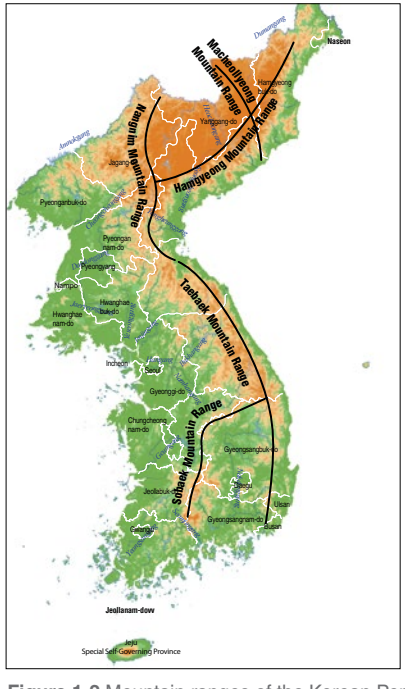


Figure 1-2 Mountain ranges of the Korean Peninsula

The peaks that stretch westward from the Taebaek and Nangnim Mountain Ranges are relatively low and broken. The reason is that long-term erosion processes have exposed watersheds between the peninsula's major rivers. Therefore, these mountains may be characterized as having been formed through land uplift, a fact clearly discernible in their landforms, and cannot be properly classified as mountains.

Mountainous areas comprise about 70 percent of the Korean Peninsula. However, most of its mountains are relatively low in altitude. Only 4 percent of Korea's mountains are higher than 2,000 meters, while about 13 percent are between 1,000 and 2,000 meters, 19 percent between 500 and 1,000 meters, and 40 percent between 100 and 500 meters—thus, over half of Korea's mountains are below 500 meters in height. In terms of altitude, peaks in the peninsula's north and along its eastern coast are high, whereas they get lower as one proceeds west and south, with the higher peaks concentrated in the major mountain ranges. The Gaema Gowon (Kaema Plateau) is situated to the north of the Hamgyeong Mountain Range and to the east of the Nangnim Mountain Range. The plateau, which is about 1,500 meters in elevation, is termed the "roof of the Korean Peninsula," and all of the peninsula's peaks with altitudes higher than 2,000 meters are scattered around this region.

Plateaus and erosion basins

Viewed from the eastern coast, the Taebaek and Hamgyeong Mountain Ranges would appear like towering folding screens. However, the relief features on these ranges are fairly uniform, with few ups and downs as one proceeds to the summit; their slopes are fairly gentle and interspersed with plateaus termed alpine plateaus, high-altitude plateaus, or flat summits (Figure 1-3). The high-altitude plateaus in the vicinity of where the Yeongdong Highway traverses the Daegwallyeong Pass in Gangwon-do along Korea's

eastern coast are used for pasturage or for alpine farming. The largest alpine plateau in Korea is the aforementioned Gaema Gowon, which sprawls to the northwest of the Hamgyeong Mountain Range.

Close to the central part of the peninsula, moving westward from the watershed as the elevation gradually decreases, some alpine plateaus can be found in the vicinity of the 1,000-meter altitude of the Taebaek Mountain Range, about 600–700 meters near Chungju, and about 500 meters on Seoul's Namhansanseong Fortress. High-altitude plateaus can also be found along the upper reaches of major rivers flowing into the East Sea.

Though the landscape to the east of Chungju and Wonju is rugged and mountainous, the area to the west is scattered with many low-altitude hills. Reaching only about 50 meters in height and with very moderate slopes, this area has largely been developed for agricultural purposes. Korea's low-altitude plateaus were formed largely from the erosion of high-altitude plateaus and are distributed widely, particularly in granite zones. In the region of the Yellow Sea coast, the low-altitude plateau is lower yet, about 25 meters. This landscape, also known as peripheral peneplain, was rapidly developed and cultivated because it exhibits little topographical upheaval, comprising as it does the more gradual western slope of Korea's *gyeongdongseong* topography.

Figure 1-3 One of Korea's high-altitude plateaus

Erosion basins have been formed through differential erosion along the upper and middle sections of Korea's major river systems: Chungju, Wonju, and Jecheon on the basin south of the Hangang River; Chuncheon on the basin north of the Hangang River; and Daejeon, Okcheon, and Geumsan on the Geumgang River basin are a few of the cities that have been established on erosion basins. Erosion basins are usually formed in the granite zone, and are typically surrounded by mountains composed of metamorphic rock.

Rivers and Plains of the Korean Peninsula

Rivers

In terms of volume, the rivers of the Korean Peninsula exhibit extreme seasonal variations, making them difficult to rely upon as resources. The fundamental cause of this unstable water flow is that heavy rainfall in Korea is limited to the summer monsoon season. When these monsoon rains do arrive, rainfalls of several hundred millimeters are not unheard of, yet in the long dry season that precedes the monsoon rains the rivers and reservoirs can dry up, threatening drinking water supplies, to say nothing of crop irrigation. Another factor contributing to the unstable water levels of the peninsula's rivers is the narrowness of the river basins. During times

of heavy rainfall, water levels in the rivers can rise precipitously, with flooding along the major rivers lasting for days.

Today, multipurpose dams along Korea's major rivers regulate the seasonal water flow. The government of South Korea has been constructing these multipurpose dams since the 1960s, important ones being the Hangang River's Soyang Dam (1973), Chungju Dam (1985), and Hoengseong Dam (2000); the Nakdonggang River's Andong Dam (1976), Hapcheon Dam (1989), Imha Dam (1992), Namgang Dam (2001), and Miryang Dam (2001); the Geumgang River's Daecheong Dam (1980) and Yongdam Dam (2001); and the Seomjingang River's Seomjingang River Dam (1965) and Juam Dam (2001). The construction of these multipurpose dams has gone far in mitigating the seasonal instability of the water flow and preventing flooding. However, they have also revealed the limits of our ability to prevent flooding caused by massive rainfall.

The mid and upper reaches of the Amnokgang, Dumangang, Hangang, Nakdonggang, and Geumgang Rivers are replete with incised meanders (Figure 1-4). These incised meanders are closely related to the asymmetric Yogok Disturbance, which took place peninsula-wide from the mid-Cenozoic period. Up to the mid-Cenozoic the Korean Peninsula was almost a uniform and flat peneplain across which it is thought rivers roamed freely. However, from the mid-Cenozoic the peninsula experienced great upheavals, causing the rivers, though maintaining their courses, to increase their downward erosion, thus creating the incised meanders.

On the other hand, the peninsula also has many straight valleys that reflect the influence of the geological structural lines called

Figure 1-4 Incised meanders along the Hangang River

tectolineaments. Representative examples include the Chugaryeong tectonic valley, traversed by the Gyeongwon railway line, which historically ran from Seoul in the west to Wonsan on the east coast, and the valley traversed by National Highways 45 and 46 connecting Cheongpyeong and Yangsuri. These valleys were formed through the gradual erosion of high-altitude plateaus, a process of differential erosion that followed the lines of tectolineaments.

Because the Korean Peninsula's primary watersheds are located on its eastern side, those rivers with effluences in the East Sea are relatively short and have steep descents. One exception to this is the Dumangang

River, which runs for about 520 kilometers and is exceptionally tortuous. Besides the Dumangang River, the other major rivers flowing into the East Sea are (from the north) the Suseongcheon Stream, Eorangcheon Stream, Dancheonnamdaecheon Stream, Bukdaecheon Stream, Bukcheongnamdaecheon Stream, Seongcheonggang River, Yongheunggang River, Anbyeonnamdaecheon Stream, and Hyeongsangang River.

The rivers emptying into the Yellow and South Seas are relatively long and have gentle descents. Because these rivers are strongly affected by tidal variations, their water levels exhibit regular variations twice per day. During high tide, the seaward river flow is reversed and water levels rise; during low tide, the river again flows toward the sea and water levels drop. The Amnokgang River, which empties into the Yellow Sea, is the Korean Peninsula's largest river, but because it flows between mountain ranges it exhibits extreme incised meanders and development of its riparian plains is minimal. Besides the Amnokgang River, the major rivers flowing into the Yellow and South Seas are, from north to south, the Cheongcheongang, Daedonggang, Yeseonggang, Imjingang, Hangang, Geumgang, Yeongsangang, Seomjingang, and Nakdonggang Rivers. Of note among these are the Daedonggang, Hangang, and Nakdonggang Rivers, which flow, respectively, through the North Korean capital of Pyongyang; the South Korean capital of Seoul; and Busan, the largest city in South Korea's Yeongnam region.

Plains

The Korean Peninsula boasts no great plains; there is no part of the

landmass where the sky stretches across a flat horizon. The most significant agriculturally developed plains are concentrated along the lower reaches of the major rivers flowing into the Yellow and South Seas. These plains can be categorized according to how they first formed: there are alluvial plains, formed from the sedimentary deposits of meandering rivers; the *chimsik jeoji*, lowlands formed through erosion; and reclaimed land, created artificially by draining parts of the sea.

The heart of the peninsula's agricultural flatlands are its alluvial plains. These consist of alluvial fans on the upper stretches of the rivers, floodplains along the middle reaches, and fan deltas on the lower portions. However, alluvial fans and fan deltas are only weakly developed on the Korean Peninsula. In the case of alluvial fans, this is because Korea's old landforms were relatively free of transition points from massive sloping points that typically form the source of an alluvial fan formation. As to the lack of fan deltas, the Yellow Sea, into which most of Korea's major rivers empty, has a very large tidal range. As a result, most sedimentary deposits reach the estuary to be deposited on the seabed.

On the other hand, Korea's major rivers have relatively wide floodplains along their lower reaches. Floodplains may be divided into natural levees and backswamps. The natural levees found along the banks of rivers have high loamy soil embankments composed of roughly equal proportions of fine sand, clay, and silt, such that from very early times they were the focus of settlement and agricultural activity. The backswamps, situated beyond these natural levees and composed primarily of clay soils, sit at a lower altitude, making them

prone to frequent flooding. In the past, these backswamp areas were simply marshes along the natural levees, but today artificial embankments have been built around the backswamps and pumping stations installed, so that the majority of these areas have been transformed into paddy fields.

The topography of the floodplains along the lower reaches of the peninsula's major rivers reveals the contours of the final stage of the sea-level rise during the postglacial age. These floodplains were created by the accumulation of river sediment based on the current sea level along the deep ravines carved during the glacial period. Therefore, none of these floodplains exceeds 10 meters in height.

The erosional lowlands are situated along the periphery of the alluvial plains or in relatively low-lying watersheds between them. Though they sit a little higher in elevation compared with the alluvial plains, and are somewhat more undulating, they are nevertheless visibly more level and plainlike relative to mountainous areas. The weathered laterite soil of the bedrock is in narrow layers and tinged with red, making it readily distinguishable from alluvial soil. And, whereas the alluvial plains have generally been used as paddy fields, the erosional lowlands find use as dry fields, orchards, pasturage, and woodlands. The erosional lowlands are primarily distributed in the peninsula's western and southern regions, but can also be found in the erosion basins along the middle and upper stretches of major rivers.

Reclaimed lands have also been created through the construction of tidal embankments off the coasts of the plains distributed in the Yellow (West) and South Sea coastal areas. Such reclamation efforts date back as far as the Goryeo Dynasty (918–1392), when they were

practiced on a small scale. However, large-scale reclamation projects did not commence until the early twentieth century and continue to the present, with the result that Korea's tidal flats are in decline.

The peninsula's major plains include the Yongcheon Plains along the Amnokgang River, the Anju and Bakcheon Plains along the Cheongcheongang River, the Pyongyang Plains along the Daedonggang River, the Jaeryeong Plains along the Jaeryeonggang River, the Yeonbaek Plains in coastal southeastern Hwanghae-do, the Gimpo Plains along the Hangang River, the Pyeongtaek (or Anseong) Plains of the Anseongcheon Stream valley, the Yedang Plains of the Sapgyocheon Stream valley, the Nonsan Plains along the Geumgang River, the Gimje and Mangyeong Plains (Honam Plains) in the Dongjingang and Mangyeonggang River valleys, the Naju Plains along the middle reaches of the Yeongsangang River, and the Gimhae Plains along the Nakdonggang River. Korea's eastern coast also has plains, though on a more modest scale. The major plains of the eastern coast include the Suseong Plains along the Suseongcheon Stream, the Hamheung Plains along the Seongcheongang River, the Yeongheung Plains along the Yongheunggang River, and the Pohang Plains along the Hyeongsangang River.

The Coastal Regions and Seas of Korea

Coastal regions

Korea is surrounded by sea on three sides and so has a long coastline. Prior to large-scale land reclamation projects in the early twentieth century, which shortened Korea's coastline, it measured some 8,693 kilometers—17,269 kilometers if all of its islands were included.

Of particular note is the coast of Korea's southwestern province, Jeollanam-do, often cited as a world-class example of a deeply contorted ria coastline.

Korea's western and southern coastlines are highly uneven, with many large and small bays and inlets as well as a wealth of peninsulas. Notably large bays off the west coast include Seohanman Bay and Gyeonggiman Bay, while the smaller ones include Gwangnyangman Bay, Daedongman Bay, Haejuman Bay, Namyangman Bay, Asanman Bay, Garorimman Bay, Cheonsuman Bay, Julpoman Bay, and Hampyeongman Bay. Among the notable peninsulas of the west seacoast are the Cheolsan, Jangyeon, Ongjin, Taean, Byeonsan, Haeje, and Muan Peninsulas. On the southern coastline, notable bays include the Boseongman Bay, Suncheonman Bay, Yeosuman Bay, Gwangyangman Bay, Sacheonman Bay and Jinhaeman Bay; major peninsulas include the Haenam, Goheung, Yeosu, and Goseong Peninsulas. Some of these bays and peninsulas have lost their original shape due to land reclamation projects.

Korea's eastern coast has fewer inlets and peninsulas and is relatively monotonous compared with the country's western and southern coastlines. Besides Donghanman Bay, comparable in size to the west coast's Seohanman Bay, notable bays of the east coast include Ungiman Bay, Najinman Bay, Cheongjinman Bay, Hamheungman Bay, Yeongilman Bay, and Ulsanman Bay; while the Hodo Peninsula stands out as an east coast peninsula. It is known that Yeongilman and Ulsanman Bays owe their formation to faulting.

Examining the topography of the coastal terrain, there are clear differences between the east and west coasts, whereas the south coast has an intermediary character. The western coastline is characterized by its extreme irregularity and great tidal ranges, a reality that has resulted in the minimal development of sandy beaches but large tidal flats. One can, however, find some moderate sandy beach development on the west coast, but only in coastal areas or portions of islands that benefit from larger breakers formed by offshore landmasses, such as the Taean Peninsula, Anmyeondo Island, and the Byeonsan Peninsula.

Tidal flats are a ubiquitous part of the topography of Korea's western coast. Tidal flats are composed by the accumulation of mud, sand, and silt carried in by the tides. Covered during periods of high tide, these flats are exposed to the air during low tides. On the western coast the largest tidal flats are found around Gyeonggiman Bay, the effluence point of major rivers like the Hangang, Imjingang, and Yeseonggang. Large tidal flats have also developed at the estuaries of the Geumgang, Mangyeonggang, and Dongjingang Rivers as well as on the southwestern coast, the effluence point of the Yeongsangang River.

Because of its relatively even coastline, deep coastal waters, and active breakers, the eastern coast exhibits superior sand beach development. The larger of the sand beaches along the eastern coast are generally along major rivers. During periods of heavy rain the rivers running down the eastern coast carry seaward great quantities of soil, most of which is deposited on beaches. Windborne sand from these sand beaches has formed into coastal dunes beyond the beaches. These beaches and their topographical linked coastal sand dunes are also a major tourist attraction.

Along with sand beaches, the topography of the east coast is dotted with lagoons, sandbars, and land-tied islands. Along coastal Hamgyeongnam-do and Gangwon-do in particular, many coastal lagoons can be found in small coastal inlets, representative examples being Gwangpo in Jeongpyeong, Sangpo and Hapo in Yeongheung, Cheonapo and Gangdongpo in Tongcheon, Samilpo and Hwajinpo in Goseong, Yeongrangho and Cheongchoho in Sokcho, Hyangho in Jumunjin, and Gyeongpo in Gangneung. The east coast also abounds in coastal islands and sandbanks, so-called land-tied islands (*yukgye-do*), with two prime examples being the Galma and Hodo Peninsulas in Yeongheungman Bay (Hamgyeongnam-do, North Korea).

Seas

The Korean Peninsula is surrounded by the Yellow (or West) Sea, South Sea, and East Sea. The Yellow and South Seas sit entirely on the continental shelf and so are relatively shallow; the Yellow Sea reaches average depths of less than 50 meters, while the South Sea reaches on average around 100 meters. During the last ice age sea levels were about 100 meters lower than the present day, so what is now the Yellow Sea was entirely exposed land and what is today Jejudo Island was connected by land to the current mainland.

A marginal sea of the Pacific Ocean, the East Sea connects Korea, the Japanese archipelago, and the island of Sakhalin, all told covering an area of about 1 million square kilometers. Its average depth is about 1,700 meters, though at its deepest point it exceeds 4,000 meters. It has a very narrow continental shelf, where depths reach less than 200 meters.

The tidal range of the Yellow Sea is tremendous, one of the greatest in the world. This is the result of the sea's shallow depth and the way that it opens out to the East China Sea, which forms part of the Pacific Ocean. The mean spring tidal range for the Asanman Bay reaches 8.5 meters, with this number falling off as one moves north or south. It is 8.1 meters in Incheon, 6.2 meters in Nampo, 4.9 meters in Yongampo, 6.2 meters in Gunsan, and 3.1 meters in Mokpo. The tidal range for the South Sea decreases as one moves from west to east: 2.5 meters in Yeosu and 1.2 meters in Busan. Such extreme tidal variations are disadvantageous for seaports along these coasts.

The tidal range of the East Sea is limited, with the mean spring tidal range reaching only 0.2–0.5 meters. This minimal tidal range can be attributed to the presence of the Japanese archipelago and Sakhalin Island, which largely cut the East Sea off from the Pacific Ocean. The East Sea is an oceanic basin, a depression formed by tremendous fault activity during the early Cenozoic Quaternary.

The Korean Peninsula's littoral waters are heavily influenced by the warm Kuroshio Current, which flows from the Pacific Ocean east of the Philippines northward along the eastern shelf of the Asian continent. The Kuroshio Current is one of the world's most powerful. It divides to the southeast of Jejudo Island into the Tsushima Current and the Yellow Sea Current.

The Tsushima Current in turn splits as it enters the East Sea, with one branch flowing north along the Japanese archipelago and the other branch becoming the Donghan (East Korea) Current and flowing northward along the peninsula's eastern coast. The effects

of the warm Donghan Current are felt as far north as the littoral waters of Hamgyeongbuk-do, which has intense summers. The Bukhan (North Korea) Current, a branch of the Liman Current, which flows southward out of the Sea of Okhotsk, flows along the coasts of Hamgyeongbuk-do and Hamgyeongnam-do. The cold Bukhan Current contributes to the extreme winters felt as far south as Gangwon-do.

The Hwanghae (Yellow Sea) Current, which flows to the west of Jejudo Island and northward toward the Yellow Sea, is relatively weak. In summer, the Hwanghae Current flows north toward the Bay of Bohaiman, but in winter its power is weaker as a result of the northwest monsoons.

Volcanic Landforms and Karst Topography

Volcanic landforms

During the Quaternary Pleistocene period, the Korean Peninsula experienced sporadic volcanic activity. During this period, there was volcanic activity in such places as Mt. Baekdusan, Cheorwon-Pyeonggang, Ulleungdo Island, and Jejudo Island. There were, however, some very small-scale eruptions during the Goryeo Dynasty (918–1392) and the Joseon Dynasty (1392–1910). Extant historical records indicate that Jejudo Island experienced eruptions in 1002 and 1007 and that Mt. Baekdusan experienced them in 1597, 1668, and 1702.

Mt. Baekdusan (2,744 m), the highest mountain on the Korean Peninsula one with great spiritual significance for the Korean people, was formed through volcanic activity during the Quaternary

Figure 1-5 Lake of Heaven (Cheonji) on the summit of Mt. Baekdusan

Cenozoic period. Mt. Baekdusan towers over a wide lava plateau that sits at about 1,600 meters in altitude. This lava plateau was formed by large amounts of basalt ejected over time from lengthy fissures in the earth's crust. Mt. Baekdusan is a stratovolcano; after forming the lava plateau, continual eruptions from a single crater over time resulted in a building up of layers of hardened lava and pyroclastic materials.

Mt. Baekdusan's summit is thickly covered in a whitish pumice stone, and also snowcapped for about seven months of the year—thus the origins of its name, which means "white head." Volcanic pumice, a stone that is light enough to float in water, was ejected from the volcano as pyroclastic material during eruptions. At Mt. Baekdusan's summit is the Lake of Heaven (Cheonji), a caldera lake with a major axis of 5.3 kilometers and a minor axis of 3.5 kilometers

(Figure 1-5).

Basalt was expelled throughout the Mt. Baekdusan volcanic zone, which stretches down along the Macheollyeong Mountain Range. The Mt. Baekdusan volcanic zone stretches as far as Mt. Duryusan and includes several volcanic peaks towering above 2,000 meters, such as Mts. Ganbaeksan (2,162 m), Sobaeksan (2,174 m), Bukpotaesan (2,289 m), and Duryusan (2,309 m), all of them surrounded by lava plateaus. Mt. Duryusan, situated at the intersection of the Macheollyeong and Hamgyeong Mountain Ranges, is a tholoide volcano with trachyte tuff rocks that after forming at the end of the Tertiary period quickly became dormant.

The Cheorwon-Pyeonggang lava plateau was formed by lava spewing from fissures in the Chugaryeong tectonic valley. This lava, after filling the valley of the Hantangang River, a tributary of the Imjingang River, then flowed southward, and after passing present-day Cheorwon and Jeongok reached the area of Yulgok-ri in the city of Paju along the main branch of the Imjingang River. The distance from Chugaryeong to Yulgok-ri is about 120 kilometers, and the Cheorwon-Pyeonggang lava plateau was formed along this stretch of wide river valley. Basalt can also be found in Anbyeon to the north of Chugaryeong in the Namdaecheon Stream valley as well as in Goseong. Further, another extensive lava plateau, contemporaneous in its formation with the Cheorwon-Pyeonggang plateau, can be found in Singye-Goksan in Hwanghae-do.

Ulleungdo Island is a volcanic island, formed from the eruption of an undersea volcano some 2,000 meters below sea level. The exposed portion of the island is only about 984 meters in altitude, but the entire volcano is about 3,000 meters high, with a base area of some 1,300 square kilometers. Ulleungdo Island, with an area of about 73 square kilometers, is a severely eroded tholoide volcano composed of basalt and trachyte agglomerate and tuff. On the island's northern side is a caldera approximately 3.5 kilometers in diameter, in the center of which towers Albong, its central cone. The base of the caldera consists of the Nari Basin at approximately 250 meters in height and the Albong Basin at about 500 meters, which together form a two-tiered crater floor. These two basins are the only large plains on Ulleungdo Island.

Jejudo Island is a volcanic island formed atop the continental shelf. Recent dating of rock forms reveals that the volcanic activity on Jejudo Island began in the Cenozoic Quaternary period. With the exception of Mt. Hallasan's summit, a tholoide volcano formed of trachyte lava, the island of Jejudo is largely a gently sloping shield volcano. This sort of terrain was formed through repeated large-scale basaltic lava flows moving out in all directions. The crater at the summit of Mt. Hallasan contains a crater lake called Baengnokdam. Compared with typical caldera lakes, this one is smaller. Further, Jejudo Island is dotted with approximately 360 parasitic volcanoes of varying dimensions, as well as lava caves or tubes concentrated along its coasts, including the Manjanggul-Gimnyeonggul Caves (together designated Natural Monument No. 98) and the Hyeopjaegul-Ssangyonggul Caves (Natural Monument No. 236).

River formation on Jejudo Island is weak. Although the island receives large amounts of rain, much of that precipitation seeps underground through fissures in the island's basalt layer, resulting

in marginal surface water. Almost all the island's rivers and streams are so-called ephemeral rivers, flowing only during times of heavy rainfall. The water that seeps and flows underground later gushes up from springs along the coast. Thus, Jejudo Island water, before it seeps underground, is extremely precious.

Karst topography

Karst topography can refer to a variety of limestone formations carved by water. On the Korean Peninsula, notable karst formations can be found in Pyeongannam-do, Hwanghae-do, southern Gangwon-do, and northeastern Chungcheongbuk-do—places where the limestone layer of the Joseon Supergroup is widely distributed. Limestone caves and dolines are particularly prevalent in these areas.

Typically found clustered in groups on flat terrain, dolines are sinkholes that have been formed through the slow corrosion of the ground by rainwater. But because the Korean Peninsula's limestone is found primarily in mountainous regions, its dolines are mainly distributed on the flat river terraces found along the banks of rivers.

Korea's limestone caves are well known among the public. Every year many tourists flock to Gosudonggul and Nodonggul Caves in Danyang (Natural Monuments No. 256 and No. 262), Gossidonggul Cave in Yeongwol (Natural Monument No. 219), Baengnyongdonggul Cave in Pyeongchang (Natural Monument No. 260), Hwanseongul-Daegeumgul Caves in Samcheok (Natural Monument No. 178), and Seongnyugul Cave in Uljin (Natural Monument No. 155).

Climate

Special Characteristics of Korea's Climate

The climate of the Korean Peninsula exhibits four distinct seasons, with generally long summers and winters and brief springs and falls. Korea's distinct seasons are the lifeblood of its national spirit. Elongated as it is, the peninsula also has great variations in climate as one moves from north to south. In the northern region, the annual temperature range can be as much as 40°C, whereas in the southern coastal regions it is only about 20°C. A climate with such great variations between summer and winter is termed a continental climate. More precisely, Korea has what is called an east coast climate, meaning that as result of its location on the eastern edge of the Asiatic continent its winters are colder and its summers hotter than locations at approximately the same latitude but on the continent's western side.

Meanwhile, the Korean Peninsula is situated in the middle latitudes of the westerly belt. Because of this, migratory high-pressure systems from China as well as temperate low-pressure systems move toward Korea, such that meteorological changes typically begin in the west and then move eastward. These high- and low-pressure systems have a great effect on the weather of the peninsula.

Temperatures

Annual mean temperatures

Affected by the northwest monsoon, the Korean Peninsula has severe winters and so its annual mean temperature is lower than in other regions that share its latitude. The highest average tempera-

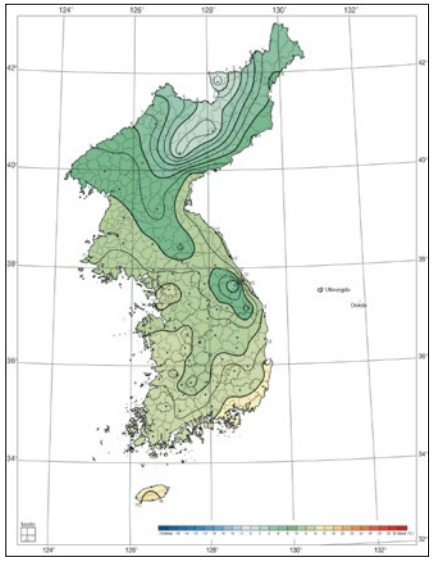


Figure 1-6 Average mean temperatures for the Korean Peninsula (1981–2010)

ture in Korea is 16.6˚C at Seogwipo on Jejudo Island. On the Korean mainland, average temperatures are highest in the southeastern coastal region—Changwon is at 14.9˚C, Busan and Tongyeong at 14.7˚C. The lowest annual mean temperature in South Korea is 6.6˚C at Daegwallyeong, while in North Korea it is 0.2˚C at Samjiyeon on the Gaema Gowon.

Generally, average temperatures drop as one ascends in altitude, so an isothermal temperature chart of the world will show average temperature values changing as one moves from sea level toward higher altitudes. However, an isothermal chart of the Korean Peninsula does not exhibit such a pattern.

Looking more closely at mean annual temperatures for the Jejudo Island locations Seogwipo (16.6˚C), Jeju City (15.8˚C), Gosan (15.6˚C), and Seongsan (15.4˚C), the average mean temperature for Jejudo Island as a whole is just over 15˚C (Figure 1-6). Besides Jejudo, other areas with mean annual temperatures above 13˚C include Tongyeong (14.7˚C), Geoje (14.2˚C), Busan (14.7˚C), Jinju (13.1˚C), Changwon (14.7˚C), Miryang (13.3˚C), Ulsan (14.1˚C), Daegu (14.1˚C), Pohang (14.2˚C), Gangneung (13.1˚C), Yeosu (14.3˚C), Mokpo (13.9˚C), Gwangju (13.8˚C), Jeongeup (13.1˚C), Jeonju (13.3˚C), and Daejeon (13.0˚C), all predominantly in the regions of Yeongnam (i.e., Gyeongsangnam-do and Gyeongsangbuk-do) and Honam (i.e., Jeollanam-do and Jeollabuk-do).

Areas with mean annual temperatures above 11˚C are generally located in the central region of Korea and include Yeongcheon (12.4˚C), Gumi (12.5˚C), Andong (11.9˚C), Mungyeong (11.8˚C), Yeongju (11.3˚C), Wonju (11.3˚C), Chuncheon (11.1˚C), Sokcho (12.2˚C), Namwon (12.3˚C), Gunsan (12.8˚C), Boryeong (12.4˚C), Cheongju (12.5˚C), Seosan (11.9˚C), Cheonan (11.8˚C), Chungju (11.2˚C), Icheon (11.6˚C), Suwon (12.0˚C), Incheon (12.1˚C), and the capital, Seoul (12.5˚C). Mean temperatures below 11˚C are generally limited to mountainous areas including Jangsu (10.5˚C), Boeun (10.9˚C), Bonghwa (9.9˚C), Jecheon (10.2˚C), Taebaek (8.7˚C), Hongcheon (10.3˚C), Daegwallyeong (6.6˚C), and Cheorwon (10.2˚C).

Winter temperatures

From the start of the Korean winter in November, temperatures drop precipitously as high-pressure systems develop in Siberia and bring on the northwest monsoons. The mean temperature on the Gaema Gowon in North Korea for the month of November is −4˚C, and by December this has dropped to −14˚C. In December, the mean temperature dips below freezing as far south as the central regions of the peninsula.

By January, the peninsula's coldest month, with the exception of Jejudo Island and the southern coastal region, mean temperatures Korea-wide have fallen below freezing. In January, the southern interior and the central regions have mean temperatures of between 0˚C and −5˚C, while in Huchang, Jaseong, and Ganggye in Pyeonganbuk-do, as well as in Samsu and Gapsan on the Gaema Gowon, the mean temperature for January is about −18˚C. The highest mean temperature for January is in Seogwipo on Jejudo Island (6.8˚C), while the lowest is in Junggangjin in Pyeonganbuk-do in North Korea (−20.8˚C). Thus, the temperature difference between north and south can surpass 25˚C.

Regarding mean January temperatures, a look at an isothermal map reveals a significant southward dip of the isothermal lines in the southern interior regions, indicative of the pronounced temperature differences between the inland and coastal areas. Further, comparing the January mean temperatures between the eastern and western coastal regions, we find that Gangneung on the east coast is at 0.4˚C and Incheon on the west is −2.1˚C, while in Hongcheon and Cheorwon in the interior mean temperatures dip as low as −5.5˚C. The reason for the higher January mean temperatures on the east coast compared with the west coast is that the Taebaek Mountain Range acts as a screen, blocking the frigid northwest monsoon winds, and the foehn phenomenon sometimes occurs as a result. The water in the East Sea is also slightly warmer than that in the Yellow Sea.

In February, the "Siberian High" high-pressure system shrinks and temperatures rise somewhat, yet the isothermal lines remain fairly unchanged from January. Mean temperatures for February include 7.8˚C for Seogwipo, 2.2˚C for Gangneung, 0.3˚C for Incheon, and −2.3˚C for Hongcheon and Cheorwon. In March, temperatures on the peninsula rise markedly as spring makes its definitive entrance.

The lowest temperature ever recorded on the Korean Peninsula was −43.6˚C at Junggangjin, in present-day North Korea on the Chinese border, on January 12, 1933. The lowest recorded temperature for South Korea is −32.6˚C, recorded at Yangpyeong in Gyeonggi-do on January 5, 1981, followed by −29.2 at Cheorwon on January 16, 2001; −28.9˚C at Daegwallyeong on January 24, 1974; −28.5˚C at Chungju on January 5, 1981; −28.1˚C at Hongcheon on January 5, 1981; −27.9˚C at Chuncheon on February 6, 1969; −27.6˚C at Wonju on January 5, 1981; and −27.4˚C at Jecheon on January 4, 1981.

Summer temperatures

Summer arrives in June and with the sun now higher in the sky the days grow longer and temperatures gradually rise. Mean temperatures in June range from 14–18˚C on the Gaema Gowon in North Korea to 20–22˚C elsewhere on the peninsula. By July, with the exception of the Gaema Gowon, temperatures peninsula-wide reach about 25˚C as the summer heat wave begins in earnest.

With the end of the summer rainy season (*jangma*) in August the peninsula comes under the influence of the North Pacific high-pressure system, with most areas experiencing their hottest temperatures of the year. During this time almost all areas south of a line between the North Korean cities of Sinuiju in the west and Hamheung in the east experience mean temperatures between 24˚C

and 26˚C, with the exception of the area around Mt. Taebaeksan, which has a cooler mean of 21˚C.

In areas to the north of the aforementioned line, temperatures are higher in July than August. For July, the Gaema Gowon and adjacent areas experience highs between 18˚C and 20˚C, while the mountainous region of Pyeonganbuk-do experiences July highs of 22˚C–24˚C, surpassing its August averages. The highest average high occurs in Seogwipo on Jejudo Island—27.1˚C during the hottest month of August. Compared with the lowest average high of 18.7˚C in Pungsan in July, we can note an average difference of over 9˚C in high temperatures.

The highest temperature recorded on the Korean Peninsula was 40˚C at Daegu on August 1, 1940. Other record highs in South Korea include 39.8˚C at Chupungnyeong on August 21, 1939; 39.4˚C at Miryang on July 20, 1994; 39.4˚C at Yeongcheon on July 20, 1994; 39.4˚C at Gangneung on July 25, 1942; 39.3˚C at Sancheong on July 20, 1994; 39.2˚C at Gimhae on August 10, 2013; 39.2˚C at Hapcheon on July 20, 1994; and 39˚C at Changwon on July 20, 1994.

Annual temperature ranges

In Korea, the mean temperature range between the hottest and coldest months, termed the annual temperature range, becomes more pronounced both as you move south to north and as you move from coast to interior. The smallest annual temperature range is at Gosan on Jejudo Island, where on average only 20˚C separates the hottest from the coldest days, while the greatest annual range is 43.5˚C at

Junggangjin in North Korea on the border with China. In Seoul, the annual temperature range is 28.1˚C. The annual temperature range of the West Coast city of San Francisco in the United States, though it sits at roughly the same latitude as Seoul, is only 8.5˚C. And London, which actually occupies a much higher latitude than Seoul, experiences an average temperature range of only 13.4˚C. This illustrates the differences between weather on eastern and western coasts.

Precipitation

Average mean rainfall

The Korean Peninsula receives less annual precipitation than neighboring Japan but rather more than such countries as the United States and France. From a global perspective, the Korean Peninsula may be categorized as a high-precipitation area. The areas that receive the most rainfall are Jejudo Island and the southern coastal areas. The area with the most annual precipitation is Geoje

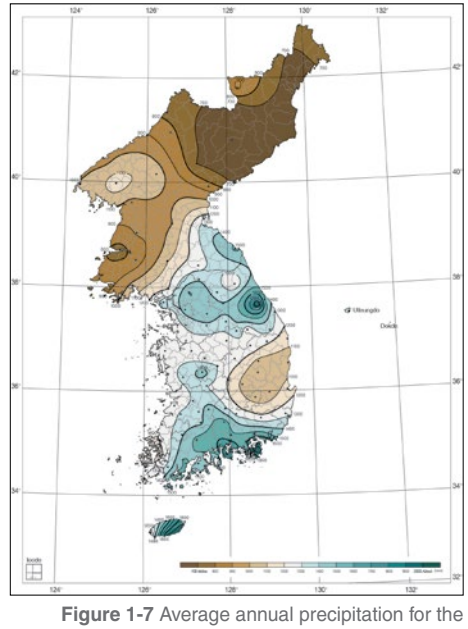


Figure 1-7 Average annual precipitation for the Korean Peninsula (1981–2010)

in Gyeongsangnam-do, with over 2,000 millimeters annually, while Seongsan and Seogwipo on Jejudo Island each receive over 1,900 millimeters. The areas with the least annual precipitation are the Gaema Gowon, which is shielded by the Hamgyeong and Nangnim Mountain Ranges, effectively blocking outside moisture, and the eastern coastal region of Hamgyeongbuk-do, which receives the cold coastal current. Of particular note is Cheongjin in Hamgyeongbuk-do, which receives a mere 615 millimeters of rainfall per year.

As Figure 1-7 illustrates, the following locales have annual average precipitation rates exceeding 1,500 millimeters: Geoje (2,007.3 mm), Seongsan (1,966.8 mm), Seogwipo (1,923.0 mm), Changwon (1,545.4 mm), Busan (1,519.1 mm), and Jinju (1,512.8 mm). Areas with annual precipitation above 1,300 millimeters include: Jeju City (1,497.6 mm), Gangneung (1,464.5 mm), Daejeon (1,458.7 mm), Tongyeong (1,450.8 mm), Seoul (1,450.5 mm), Yeosu (1,439.0 mm), Sokcho (1,402.2 mm), Gwangju (1,391.0 mm), Jecheon (1,387.8 mm), Namwon (1,380.4 mm), Chuncheon (1,347.3 mm), Wonju (1,343.6 mm), Taebaek (1,324.3 mm), Jeongeup (1,317.3 mm), Jeonju (1,313.1 mm), and Suwon (1,312.3 mm).

Average annual precipitation rates and their distribution are closely linked to terrain and atmospheric pressure patterns. The reason for the high annual precipitation rates along the southern coastal region and the mountain region around Mt. Jirisan is not just topography; the north-south shifting rainy season front also makes a prolonged stay in the region, and these areas also feel the effects of typhoons.

Areas that receive on average over 1,100 millimeters of annual precipitation include Yeongju (1,290.9 mm), Seosan (1,285.7 mm), Ulsan (1,277.1 mm), Mungyeong (1,259.8 mm), Boryeong (1,244.3 mm), Cheongju (1,239.1 mm), Incheon (1,234.4 mm), Miryang (1,229.4 mm), Cheonan (1,226.5 mm), Chungju (1,212.7 mm), Gunsan (1,202.0 mm), Mokpo (1,163.6 mm), Pohang (1,152.0 mm), and Uljin (1,119.0 mm).

Those regions of the peninsula that receive less than 1,100 millimeters of average annual precipitation are generally limited to the Yeongnam region. They include Yeongdeok (1,072.7 mm), Gumi (1,072.5 mm), Andong (1,066.4 mm), Daegu (1,064.4 mm), Yeongcheon (1,046.8 mm), and Uiseong (1,031.7 mm). Annual rainfall is particularly slight in the interior regions of Yeongnam, which essentially forms a gigantic basin shielded to its west and north by the Sobaek Mountain Range, to its east by the Taebaek Mountain Range, and by high peaks to its south.

Summer precipitation

With the exception of some insular regions, during the Korean Peninsula's rainy season between June and September almost all areas receive over 60 percent of their annual precipitation (Table 1-2). And among these months it is July that records the highest rainfall. However, the rates of annual precipitation can vary from year to year, depending on the influence of the rainy season and typhoons.

The rainy season begins with the expansion of the North Pacific high-pressure system and the northward movement of the rainy season front. Generally, the rainy season begins on the Korean Peninsula in late June and continues into late July. The rainy season front, forming between the North Pacific high-pressure and polar

high-pressure systems, is also known as the polar front. The rainy season front stretches for some 300 kilometers; meanwhile, the approach of the lower-pressure system that develops in the Yangtze River region in China also brings with it heavy rainfall. The rainy season front reaches the peninsula's southern coast in late June, makes its way to the central regions by mid-July, and by late July reaches as far as the Amnokgang River region on the Chinese border.

As the rainy season front moves northward toward Manchuria, the hot and humid North Pacific air mass begins to dominate the Korean Peninsula and the sweltering high summer season begins in earnest. During this time, although there are localized thunderstorms, there is not much rainfall. The rainy season front that moved northward will shift south again, resulting in the briefer autumn

Table 1-2 Average rainy season precipitation and annual average precipitation for Korea's major cities, 1981–2010 (millimeters)

City	June	July	August	September	Total rainy season (A)	Annual average precipitation (B)	Precipitation outside the rainy season (A/B)
Seoul	133.2	394.7	364.2	169.3	1,061.4	1,450.5	0.732
Incheon	112.0	319.6	285.8	153.5	870.9	1,234.4	0.706
Daejeon	206.3	333.9	329.5	169.7	1,039.4	1,458.7	0.713
Gwangju	181.5	308.9	297.8	150.5	938.7	1,391.0	0.675
Daegu	142.6	224.0	235.9	143.5	746.0	1,064.4	0.701
Ulsan	176.8	232.3	240.3	168.2	817.6	1,277.1	0.640
Busan	206.7	316.9	255.1	158.0	936.7	1,519.1	0.617

Source: Korean Meteorological Association

rainy season in September.

During the high summer months, between the summer and autumn rainy seasons, the Korean Peninsula often experiences rain-packed typhoons. Generally, the months between July and September see the approach of typhoons, with very powerful storms striking the southern regions on average every other year, and the central regions once every four years. While the economic damage caused by typhoons has increased exponentially with urbanization and industrialization, the effective dissemination of meteorological information has gradually reduced the human casualties.

Winter precipitation

On average, winter precipitation accounts for only 10 percent of the Korean Peninsula's total annual precipitation. The northwest seasonal monsoon that blows out from the Siberia high-pressure system is cold and dry. However, after picking up moisture as it passes over the Yellow Sea, these winds can result in heavy snowfalls once they encounter mountainous regions. The alpine coastal regions of Korea's west coast, covering parts of Jeollabuk-do and Jeollanam-do and including such cities as Jeongju, Jeongeup, Gochang, and Yeonggwang, can experience heavy snowfalls brought in by the northwest monsoons, often resulting in transportation disruptions.

The heavy snowfalls that often hit the Yeongdong region (corresponding to the coastal provinces of Gangwon-do in both North and South Korea) in February are usually the result of northeasterlies that blow down from a migratory anticyclone pattern as it passes over the northern part of the peninsula after

having separated from the Siberian high-pressure system. The heavy snowfalls in the mountainous regions are usually the result of moisture-laden winds blowing in from the sea.

The area of Korea with the heaviest recorded snowfall is Ulleungdo Island, which on January 31, 1962, recorded 293.6 centimeters of snow. On this snow-prone island, a unique form of dwelling called the *udegi* developed to cope with the adverse conditions. Even today, after a heavy snowfall, residents will don snowshoes called *seolpi*.

Variations in annual precipitation

The Korean Peninsula belongs to the humid climatic zone. However, average precipitation levels vary widely, resulting in frequent flooding and drought. Generally speaking, extreme precipitation is more than three times more common than extreme dryness. In Seoul, for example, there was 633.7 millimeters of precipitation in 1949, while in 1990 the corresponding figure was more than 3.7 times higher at 2,355.5 millimeters. Over the past decade, the highest annual precipitation level for Seoul was 2,044 millimeters and the lowest was 1,212 millimeters (Table 1-3).

Because the Korean Peninsula receives the bulk of its rainfall in the summer months, annual precipitation figures correlate closely

Table 1-3 Annual precipitation for Seoul, 2001–2010 (millimeters)

Year	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Annual precipitation	1,386	1,388	2,012	1,499	1,358	1,682	1,212	1,356	1,564	2,044

Source: Korean Meteorological Association

with summer precipitation figures. In terms of peninsula-wide rainfall, the years 1939, 1942, 1944, 1988, and 1994 were years of low precipitation; while 1925, 1941, 1948, 1963, 1998, and 2003 were years of high precipitation. These were, respectively, years of drought and severe flooding.

Most weather-related disasters in Korea are the result of severe flooding brought about by typhoons or heavy rainfall. The years 1998, 1999, 2002, 2003, and 2006 stand out as years in which South Korea experienced over KRW 1 trillion (US$1 billion) in precipitation-related damage. The year 2002 was particularly bad. On August 31 of that year, Typhoon Rusa dumped 870.5 millimeters of rain on the Gangneung region on South Korea's east coast, with the heaviest hour recording 100.5 millimeters. In the Gangneung area alone there were sixty-eight storm-related casualties, including forty-six deaths, five people reported missing, and seventeen people injured. Property damage exceeded KRW 800 billion (US$800 million).

Wind

The prevailing winds in Korea are the northwest seasonal monsoons that blow in the winter months. These winds emerge out of the Siberian high-pressure system, one of the most powerful high-pressure systems on the planet. In the summer the peninsula is greatly affected by the North Pacific high-pressure system. However, this system is not as strong as winter's Siberian high-pressure system, and so in summer Korea does not experience winds from a single direction such as might be termed prevailing winds. However, somewhat dominant during the summer are the southern winds—

the southwesterly, southerly, and southeasterly. Along the western coast, although the southwesterly wind is slightly more dominant than the southeasterly, once winter comes the southwesterly is much weaker than the blowing northwest monsoons.

In the spring and fall, migratory anticyclones and temperate cyclones that form in China will often pass through the Korean Peninsula, resulting in changes in wind direction on the ground. These migratory anticyclones and temperate cyclones blow out of the west and toward the east, because westerlies are continuously blowing in the upper atmosphere of the Korean Peninsula.

In terms of local winds, representative examples are the maritime breezes that blow toward the coastal regions in the summer months, and the so-called *nopsae* wind that blows toward the Yeongseo region (the interior areas of Gangwon-do in both North and South Korea) in late spring and early summer. The maritime breezes are the result of differences in temperature between the sea and land, and on sunny days in high summer can blow quite vigorously. These *nopsae* winds, northeasterlies that originate from the Sea of Okhotsk, create a foehn phenomenon as they pass over the Taebaek Mountain Range, becoming warm, dry winds as they blow down into the Yeongseo region of the interior. *Nopsae* is a traditional Korean word for a northeasterly wind. The *nopsae* winds create a temperature variance between the Yeongdong and Yeongseo regions of between 5 and 7.5°C (41–45.5°F), though this can be as great as 10°C (50°F). Naturally, if these foehn winds are very powerful, not just the Yeongseo region but a wide swath of territory, including Gyeonggi-do, Chungcheongnam-do, Chungcheongbuk-do, and Hwanghae-do, will be affected.

Fog

Fog frequently occurs in fall, with its large diurnal temperature range, as well as in the humid months of summer. The area of the peninsula with the highest occurrence of fog is at Daegwallyeong (a mountain pass in the Taebaek Mountain Range in eastern South Korea), which has recorded more than 130 days of fog annually. Fog is particularly common at Daegwallyeong during the rainy season between June and September. Fog here is caused mainly by wet air coming off the East Sea, which then forms clouds as it rises over the Taebaek Mountain Range.

In fall, fog-prone locales like Suncheon and Jinju can also experience as many as ninety foggy days. Each of these two locations is adjacent to a reservoir—Juamho Lake and Jinyangho Lake, respectively—and encircled by mountains. As a result, these areas have abundant water vapor and cooler air flowing down from the nearby mountains. That and the naturally occurring radiative cooling of the earth's surface bring about temperature inversion and frequent fog. Locations like Imsil, Chungju, and Andong have similar conditions and also experience many foggy days. Cities such as Hongcheon, Yeongwol, Hapcheon, and Geumsan, situated near large rivers and surrounded by high mountains, are likewise fog-prone.

In the southwest coastal region, more than 60 percent of the year's foggy days occur in the summer. In early summer, the group of islands between Heuksando and Jindo Islands off the southwest coast of the peninsula frequently experience advection fog, a fog caused by a hot and humid wind blowing over relatively cool water. Meanwhile, in the northern portion of the peninsula, places like

Unggi, Cheongjin, and Seongjin on the eastern coast experience frequent fog during June and July as a result of the cold North Korean current. Because sea fog tends to persist longer than ground inversion fog, it can interfere greatly with sea transport.

Frost

Frost is formed when moisture-laden air comes into contact with a cold ground surface to form minuscule ice particles. The areas on the Korean Peninsula experiencing the earliest frost are Samsu and Gapsan on the Gaema Gowon in North Korea, where the first frost arrives around September 10. Following this, frost first makes its appearance in Korea's central interior and on the entirety of the Jinan Plateau in the south around October 10, with Busan receiving its first frost around December 20. The last area to receive frost is Gosan on Jejudo Island, which receives its first frost around January 20.

Frost begins to disappear first in the south with the rising temperatures of spring. It does so first in Gosan, around January 30. Samsu and Gapsan have the longest period of frost, and it does not go away until around May 10. Frost persists on the Jinan Plateau until approximately the end of April.

The longer the frost-free period—the time between the last frost of spring and the first frost of fall—the more advantageous for agriculture. On the Korean Peninsula, areas with the shortest frost-free periods are Samsu and Gapsan, where there are about 120 days without frost. Conversely, Gosan has the longest frost-free period at 350 days. The Jinan Plateau has a frost-free period of about 160 days, much briefer than that of surrounding regions.

Seasonal Change and Weather

Winter

Winter conditions on the Korean Peninsula are influenced by the rise and fall of the Siberian high-pressure system. With a maximum central pressure of 1,050 hectopascals, the Siberian high-pressure system is an extremely powerful system. Looking at the Korean Peninsula, the winter atmospheric pressure is representative of the "high west, low east" pattern, wherein its pressure is influenced by both the Siberian high-pressure system and the Aleutian atmospheric pressure. When the Siberian high-pressure system is at its strongest, the difference in central pressure between the two systems can reach 80 hectopascals. During this time the cold, dry northwest seasonal monsoons blow vigorously and temperatures plummet. During these cold spells the weather is generally clear, though snow can fall on the western slopes of the Noryeong and Sobaek Mountain Ranges as well as on Ulleungdo Island and the upper altitudes of Jejudo Island.

When the Siberian high-pressure system recedes, the "high west, low east" pattern of atmospheric pressure weakens. With the retreat of the Siberian high-pressure system, a migratory high-pressure system moves over the peninsula, winds become varied, and temperatures rise. And when a low-pressure system that has formed behind this migratory high-pressure system moves over the peninsula, weather conditions deteriorate and there can be snowstorms.

Influenced by the rise and fall of the Siberian high-pressure system, Korean winter weather exhibits a seven-day pattern called "three cold, four warm." In reality, however, the peninsula's winter

temperatures can be very irregular from year to year, with some years exhibiting very low temperatures and others having long spells of warmer weather. When the Siberian high-pressure system is very developed and dominant, the "west high, east low" pattern is seen and Korea experiences a cold winter. However, when this atmospheric pressure is not very developed the Siberian high-pressure system tends to extend further south and the northwest seasonal monsoons are weak, resulting in warmer winter temperatures on the peninsula.

Spring

With the arrival of spring the Siberian high-pressure system gradually retreats and the northwest seasonal monsoons also weaken. As the Siberian high-pressure system retreats, the migratory high-pressure system moves in. Because this migratory high-pressure system has a low-pressure system behind it, spring brings with it the most extreme weather changes of the year. The migratory high-pressure and low-pressure systems generally transit the peninsula every three or four days.

After the low-pressure system and its rain has passed through, weather on the peninsula gradually becomes warmer. However, if the Siberian high-pressure system is prolonged, the northwest seasonal monsoons will blow and the result will be a spell of severe spring cold. Sometimes the migratory high-pressure system slows down in its transit across the peninsula, resulting in a long spell of clear, dry weather, and poses the threat of a serious spring drought.

In Korea, spring is the season of the "yellow dust" (*hwangsa*) blowing in from China. This yellow dust carried in on the westerlies not only brings in pollutants but also worsens visibility. When the yellow dust is especially severe, the atmosphere can become so hazy that it appears foggy. What's more, in late spring and early summer there are frequent *nopsae* winds caused by the foehn phenomenon.

Summer

From late spring to early summer, the Okhotsk high-pressure system extending down from the northeast has a strong influence on the peninsula's weather. As the Okhotsk high-pressure system with its cool and humid northeast air extends toward the East Sea off the Korean Peninsula and becomes dominant there, it brings a cooling effect while also effectively blocking the movement of the yellow dust from the west, and thus improving visibility. These developments take place before the arrival of the summer *jangma*, or rainy season.

With the extension southward of the North Pacific high-pressure system, the seasonal rain front moves north and the peninsula's rainy season begins. Korea's *jangma* is associated with the polar front that forms between the North Pacific and polar high-pressure systems. The strength of these two air masses will affect the timing of the rainy season's arrival as well as the scope and impact of the rainfall it brings.

Once the rainy season commences, heavy rainfalls are experienced throughout the peninsula. The rains mainly arrive over a two- or three-day stretch as a weak low-pressure system that forms from the rain front in the Yangtze River basin area in China moves eastward toward Korea. However, when either a migratory low-pressure system emerging from North China moves southeast or the Okhotsk high-pressure system expands southwest, Korea's rainy season front can be pushed southward briefly, resulting in a re-

spite from the rains. This break usually lasts one or two days but can stretch to four or five. If the rainy season makes landfall late or passes over the peninsula too quickly, the result can be a summer drought.

Around late July, the rainy season front moves north toward Manchuria and under the influence of the powerful North Pacific high-pressure system high summer begins, with temperatures on the peninsula surpassing 30˚C (86°F). In high summer, the North Pacific high-pressure system dominates over a wide swath of the southern portion of the Korean Peninsula, while in the northern portion a low-pressure system forms, such that a "high south, low north" pressure pattern occurs. Under the domination of the North Pacific high-pressure system, Korea's high summer is characterized by sweltering heat and high humidity. However, if the North Pacific high-pressure system retreats temporarily, then the rainy season front will shift back south, resulting in worsening weather conditions but a temporary respite from the intense heat.

In years when the North Pacific high-pressure system is exceptionally weak the result is a colder-than-normal summer, with a negative impact on agriculture. Conversely, in years with an exceptionally powerful North Pacific high-pressure system, abnormally high temperatures become a problem. The year 1980 is a representative example of a year with a cool summer. That year in Seoul, there was only a single day in which the temperature exceeded 30˚C, with average summertime highs ranging between 17 and 20˚C (62.6–68°F). The year 1994 is an example of a year with abnormally high temperatures. Temperatures for July of that year were on average 2–5˚C higher than normal, with peninsula-wide temperature extremes.

The period from late August to early September sees the development of the Siberian high-pressure system as the high summer pressure pattern collapses. The rainy season front that had moved north now shifts south again and brings the early-autumn rainy season. The early-autumn rainy season persists the longest on Jejudo Island.

Autumn

After early September, one migratory high-pressure system after another emerging out of the Siberian high-pressure system passes through the Korean Peninsula, bringing with it pleasant autumn conditions, lower temperatures, and clear skies that continue for an extended time. However, the trough that follows these migratory high-pressure systems brings with it the autumn rains.

The autumn pressure systems are similar to their spring counterparts. After October, with the emergence of the Siberian high-pressure system, a "high west, low east" pressure pattern sometimes develops, and the blowing of the northwest seasonal monsoons announces that winter is not far off.

Soil and Vegetation

Soil

Classification according to general soil characteristics

Factors that determine the characteristics of soil include such things as climate, vegetation, rocks, and terrain. In terms of its climate and vegetation, the Korean Peninsula's representative soil type is brown forest soil. This type of soil is typical of regions with high summer

temperatures and ample rainfall distribution, and in Korea can be found throughout the peninsula's central and southern regions. In the Gaema Gowon in the north, podzol soils are well developed, reflecting the area's low temperatures and rich organic matter.

Because the most basic component of soil is rock, the properties of any given soil are intimately related to rock types. Coarse, crystalline granite rock is widely distributed in Korea, and in such places the soil is sandy and has good drainage. On the other hand, in regions with microcrystalline gneiss, clayey soils are prevalent.

Terrain conditions also have a significant impact on soil characteristics. Floodplains, for instance, are rich in alluvial soils due to the sedimentation of the rivers, though the ratios of sand, silt, and clay in these alluvial soils will vary by location. For instance, soils around natural levees are loamy—they have equal proportions of sand, silt, and clay—while the soil of backswamps is predominantly clayey soil. Due to its good drainage and water-holding capacity, loamy soil is optimal for agricultural fields, whereas clayey soil is often converted to wet paddy fields due to its poor drainage. In the reclaimed land of the southern and western coastal regions, saline soil can be found. This type of soil is actually quite rich once the saline is removed.

Laterite: red soil

Usually termed "loess," laterite soil or red soil is found extensively in regions where there are gently sloping, low-lying hills (under 150 meters in altitude). The laterite soil layer is about 1–1.5 meters in depth, with the topsoil portion red in color and the subsoil portion a red to reddish-yellow color. A distinguishing characteristic of laterite soil is its heavy clay component; this is because it consists of weathered gneiss. Soil created by weathered granite is gravelly and has a heavy sand component.

Another characteristic of laterite soil from weathered gneiss is that it does not exhibit soil layering. While laterite soil has extremely low levels of alkalis and organic matter, it is rich in silica, iron oxide, and aluminum oxide. This type of laterite soil is produced under hot and humid climatic conditions. There is still wide debate among scholars as to whether this laterite soil was created under the hot and humid conditions that currently characterize the Korean Peninsula or whether it was created in more extreme climatic conditions in the distant past. However, there is broad support for the view that laterite soil was formed during the Cenozoic Tertiary period.

The U.S. Soil Taxonomy System

In 1975, the United States Department of Agriculture (USDA) introduced its Soil Taxonomy System, which classifies soils according to their soil profiles. This system has gained widespread use worldwide and has become the primary classification system in such fields as geography.

According to the USDA Soil Taxonomy System, among the twelve types of soil found worldwide, seven are found in the central and southern parts of the Korean Peninsula (i.e., in South Korea). These are inceptisol, entisol, ultisol, alfisol, andisol, mollisol, and histisol. The most widespread of these soils in South Korea is inceptisol, which has no discernible soil layering. Inceptisol covers some 6.67 million hectares in South Korea, or about 74.71 percent of the national territory (Table 1-4). This reflects the development

Table 1-4 Main soil types in the central and southern regions of the Korean Peninsula (or South Korea)

Soil Type	Inceptisol	Entisol	Ultisol	Alfisol	Andisol	Mollisol	Histosol
Percentage of Total	74.71	15.06	4.99	3.67	1.47	0.09	0.01

Source: Rural Development Administration

of Korea's natural environment—namely, a very mountainous landscape and a climate with rainy summers, resulting in the continual loss of topsoil as well as sedimentation, which hinders the development of soil cross-stratification. Further, a hot and humid summer climate inhibits the accumulation of layers of organic material, while freezing in winter also makes soil cross-stratification difficult.

In general, we know that the climatic characteristics of the central and southern regions of the Korean Peninsula contribute to the development of alfisol and ultisol. However, because of Korea's highly mountainous topography, clay minerals tend more often to migrate along the surface rather than vertically. Accordingly, in the southern and central regions of the Korean Peninsula, inceptisol and entisol are more widely distributed than alfisol and ultisol.

Vegetation

Warm temperate forest zone

In Korea, the warm temperate forest zone (evergreen broad-leaved forest zone) extends in the interior as far as 35 degrees north latitude, while on the coasts it extends to 35°30′ north latitude. In the southern coastal and coastal island areas, where annual mean temperatures average 14°C or above, one finds a mixture of temperate broad-leaved

evergreens and deciduous broad-leaved trees. In terms of species, this zone has *Quercus acuta* (Japanese evergreen oak), *Quercus myrsinaefolia* (bamboo-leaf oak), the *sieboldii* variety of the *Castanopsis cuspidata* (a species of castanopsis), *Cinnamomum camphora* (camphor), *Camellia japonica* (camellia), *Quercus glauca* (ring-cupped oak or glaucous-leaf oak), *Cinnamomum japonicum* (Japanese cinnamon), *Machilus thunbergii* (a species of evergreen shrub), *Neolitsea sericea* (a medium-sized evergreen tree), and *Euonymus japonicus* (an evergreen shrub). Vine species include the *Piper kadsura* (Japanese pepper), *Trachelospermum asiaticum* (Asiatic jasmine), *Kadsura japonica* (Kadsura vine), *Ficus thunbergii,* and *Stauntonia hexaphylla*.

Temperate forest zone

With the exception of high alpine regions, the temperate forest region (deciduous broad-leaved forest zone) is found between 35 and 43 degrees north latitude. Typical of the species found here are *Acer palmatum* (Japanese maple), *Quercus mongolica* (Mongolian oak), *Quercus dentata* (Japanese emperor oak), *Quercus serrata* (Bao Li), *Quercus aliena* (Oriental white oak), *Betula platyphylla* var. *japonica* (Japanese white birch), *Zelkova serrata* (Japanese elm), *Styrax japonicus* (Japanese snowbell), *Styrax obassia* (a species of flowering plant), *Carpinus tschonoskii* (Asian hornbeam), *Lindera erythrocarpa* (red-fruited spice bush), *Lindera obtusiloba* (blunt-lobed spice bush), and the *Acer pictum* subspecies *mono* (painted maple). The annual mean temperature of the deciduous broad-leaved forest region ranges between 5°C and 14°C, and it can be subdivided into southern, central, and northern subzones, according to geographic location and botanical composition.

The southern temperate forest subzone lies between 35 and 36 degrees north latitude, though it stretches as far as the thirty-eighth parallel along the eastern coast and to 37˚30′N on the west coast. Main species found in this region include ones typical of the temperate forest zone, including the *Carpinus tschonoskii* (Asian hornbeam), *Lindera erythrocarpa* (red-fruited spice bush), *Meliosma myriantha* (a flowering shrub), *Pourthiaea villosa* (Oriental photinia), *Zanthoxylum schinifolium* (Szechuan pepper), *Acer palmatum* (Japanese maple), *Sapium japonicum* (Neoshirakia), *Platycarya strobilacea* (Platycarya), *Celtis sinensis* (Chinese hackberry), and the *Lindera glauca* (greyblue spice bush), as well as some common to the warm temperate forest zone, such as the *Euonymus japonicus* (an evergreen shrub), *Euonymus fortunei* var. *radicans* (fortune's spindle), *Daphniphyllum macropodium* (daphniphyllum), and varieties of bamboo like *Phyllostachys bambusoides* (madake or giant timber bamboo) and *Sinoarundinaria nigra* var. *henonis* (black bamboo). Additionally, there are warm temperate zone species such as *Pinus densiflora* (Japanese red pine), *Cephalotaxus koreana* (Korean plum yew), and *Pinus thunbergii* (black pine).

The central temperate forest subzone stretches to 40 degrees north latitude on the eastern coast, 39 degrees north latitude on the western coast, and to 38˚30′N in the interior. Primary deciduous broad-leaved species found here include *Zelkova serrata* (Japanese elm), *Styrax japonicus* (Japanese snowbell), *Quercus mongolica* (Mongolian oak), *Quercus serrata* (Bao Li), *Quercus aliena* (Oriental white oak), *Quercus urticifolia*, *Lindera glauca* (greyblue spice bush), *Lindera obtusiloba* (blunt-lobed spice bush), and the *Betula dahurica* (a species of birch). Warm temperate zone species such as the *Juniperus chinensis* (Chinese juniper), *Abies holophylla* (needle fir) and *Pinus densiflora* (Japanese red pine) can also be found here.

The northern temperate forest subzone sits north of the central subzone and extends as far as the borders with China and Russia. Major deciduous broad-leaved species of this area include *Tilia amurensis* (Amur tilia), *Tilia ovalis* (Manchurian tilia), *Prunus maackii (Manchurian cherry), Acer tegmentosum* (Manchurian striped maple), *Acer komarovii* (Komarov maple), *Acer ukurunduense* (Ukurundu maple), *Lonicera chrysantha* var. *crassipes* (a deciduous shrub), *Tilia vulgaris* (common tilia), *Betula schmidtii* (Schmidt birch), *Quercus mongolica* (Mongolian oak), *Corylus heterophylla* (Asian hazel), *Betula costata* (Manchurian birch), and *Syringa patula (*Manchurian lilac*),* along with needle-leaved evergreens such as the Abies holophylla (needle fir) and *Pinus koraiensis* (Korean pine), as well as deciduous conifers such as the *Larix olgensis* (Olgan larch).

Mixed forest zone

The mixed forest zone refers to forest containing a mixture of conifers and broad-leaved trees. There are many planted forests that exhibit trees of all the same species, but natural forests are generally mixed forests. Generally, to speak of a mixed forest means the percentage of neither broad-leaved nor coniferous trees make up more than 75 percent of the total.

The vegetation of the Hamgyeong, Taebaek, and Sobaek Mountain Ranges, which together form the spine of the Korean

Peninsula, is composed of approximately 60 percent deciduous forest and 30 percent mixed deciduous and coniferous forest. Representative trees of the Taebaek and Sobaek Mountain Ranges are the *Quercus mongolica* (Mongolian oak), *Quercus serrata* (Bao Li), *Acer pseudosieboldianum* (Korean maple), *Pinus densiflora* (Japanese red pine), *Fraxinus sieboldiana* (Siebold ash), *Quercus variabilis* (cork oak), *Fraxinus rhynchophylla* (mountain ash), *Pinus koraiensis* (Korean pine), *Quercus dentata* (Japanese emperor oak), and the *Acer pictum* subspecies *mono* (painted maple). In terms of small shrubs, common species include the *Rhododendron schlippenbachii* (royal azalea), *Rhododendron mucronulatum* var. *mucronulatum* (a variety of rhododendron), *Lindera obtusiloba* (blunt-lobed spice bush), *Tripterygium regelii* (Regel's threewingnut), *Sasa borealis* (a species of bamboo), *Lespedeza maximowiczii* (Maximovich lespedeza), *Weigela subsessilis* (canary weigela), *Symplocos chinensis* (Chinese symplocos), *Rhus trichocarpa* (bristly fruit sumac), and *Lespedeza bicolor* (shrubby bush clover). And regarding varieties of grasses and flowering plants, one finds *Carex humilis* var. *nana* (dwarf ground sedge), *Carex lanceolata* (a species of carex), *Aster scaber* (a perennial herb known to Koreans as *chamchwi*), *Ainsliaea acerifolia* (a perennial woodland herb), *Spodiopogon cotulifer* (a species grass), *Artemisia keiskeana* (a kind of mugwort), *Disporum smilacinum* (a flowering perennial), *Astilbe chinensis* (Chinese astilbe), *Atractylodes japonica* (Japanese atractylodes), and *Melampyrum koreanum* (Korean melampyrum).

The mixed forest zone boasts a variety of species that are not only very resistant to climatic disasters, forest fires, and environmental pollution, but play an excellent role in nature conservation. Therefore, many deciduous trees are now being mixed in with what were originally artificial coniferous forests to create new mixed deciduous and coniferous forests.

Needle-leaved evergreen zone

Needle-leaved evergreen coniferous forest zones can be found in high alpine areas in the south, central, and northern parts of the peninsula where the mean annual temperature is 5°C or below and where the January mean temperature is −12°C or below. Primary species found in this zone have adapted to the frigid winters and short growing season and include the *Abies holophylla* (needle fir), *Picea jezoensis* (Jezo spruce), *Abies nephrolepis* (Manchurian fir), *Picea koraiensis* (Korean spruce), *Pinus koraiensis* (Korean pine), *Pinus pumila* (Siberian dwarf pine), *Thuja koraiensis* (Korean thuja), and *Taxus cuspidata* (spreading yew), along with evergreen broad-leaved and deciduous coniferous species such as the *Larix olgensis* (Olgan larch), *Larix olgensis* var. *amurensis* (Amur larch), and even deciduous broad-leaved trees such as the *Betula costata* (Korean birch) and *Betula platyphylla* (Japanese white birch).

Vertical vegetation zone

Vertically, the Korean Peninsula may be divided into zones according to latitude and altitude. From the lowest to highest these are, along with the types of vegetation found there: the colline or hilly belt (evergreen and deciduous broad-leaved forests), the piedmont belt (deciduous broad-leaved forests and mixed forests consisting of broad-leaved de-

ciduous trees and needle-leaved evergreens), the subalpine belt (coniferous forest), and the alpine belt (shrub and alpine grassland). As one ascends from the alpine meadow zone, dense alpine forests make their appearance. In the low mountains of the peninsula's southern region, these forests are a mixture of broad-leaved evergreen and deciduous trees. As one climbs in altitude one encounters primarily broad-leaved deciduous trees; however, the highest alpine forests have a mixture of evergreen conifers and broad-leaved deciduous trees.

At high altitudes one reaches the forest line or timberline, after which no commercially viable trees will grow. Proceeding higher one reaches the tree line, where growing conditions are so poor that trees cannot grow more than 3–5 meters. In the subalpine belt, which stretches from the timberline to the tree line, one can find varieties of coniferous evergreens such as the *Abies koreana* (Korean fir), *Picea jezoensis* (Jezo spruce), *Abies nephrolepis* (Manchurian fir), and *Pinus densiflora* (Japanese red pine), as well as varieties of birch and rhododendron, including *Rhododendron schlippenbachii* (royal azalea), which Koreans call *cheoljjuk*. However, the species of trees found in the subalpine belt will vary somewhat by region.

Above the tree line one reaches the alpine belt, subdivided into alpine shrubland and grassland. In the alpine shrubland are found short woody shrubs and bushes, while above this area sits the alpine grassland. All the vegetation in the alpine zone is short, with roots that burrow deep and are relatively elongated compared with its stems and branches. Alpine belt shrubs tend to grow close to the ground, while plants here have thickened leaves with hairs on their surface to better capture moisture while also providing an advantage against cold temperatures.

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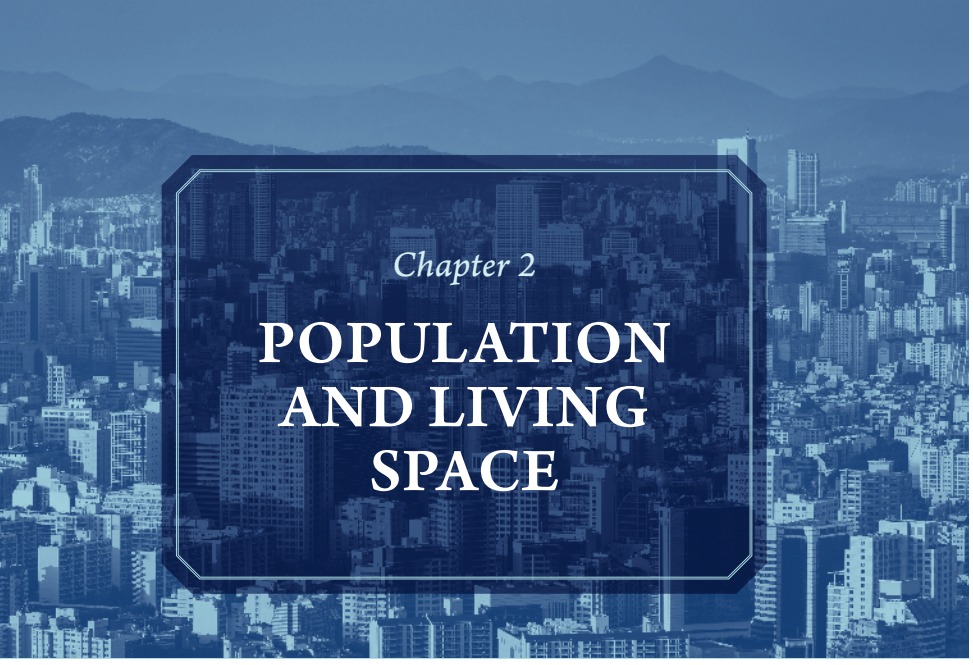

Chapter 2

POPULATION AND LIVING SPACE

Population

Population refers to the total number of individuals inhabiting a given area. As the most basic component of a society or country, it is very important as an indicator of various social phenomena. Further, population can reflect a given society's or country's natural, economic, and cultural conditions, and is also critically important because of its tremendous influence on the long-term development and even survival of that society or state.

Population Growth

The most basic concept in discussions of population is population size, and generally when we speak of changes in population size we are talking about population fluctuations. At this time, a population

fluctuation refers to a quantitative change in the population of a given area or country over a given amount of time, to include both increases and reductions in population. Population change can be achieved either naturally through changing rates of births and deaths or as a result of social phenomena such as migration. Population change will naturally vary by state and region and can be influenced by such factors as economics, religious and ethical systems, population policy, and the presence or absence of a health-supporting living environment.

Understanding the varied aspects of population and population change requires accurate population statistics. Modern censuses began in Korea as early as 1925 and have been undertaken every five years since that time. But even prior to this, there were population surveys as far back as ancient periods for purposes of taxation or corvée labor, though very little documentation is extant and records that have survived are fragmented. We have some population statistics from the Joseon Dynasty (1392–1910), and population data can also be culled from such things as gazetteers, maps, and historical records.

Korea's Population Change

From ancient times through the Joseon Dynasty

From extant historical documents and gazetteers we can estimate that around the start of the Common Era the population of the Korean Peninsula was about three million. During the Goryeo Dynasty (918–1392), a regular population census was initiated, though almost nothing is extant from these surveys. In the tenth century, during the early Goryeo period, it is estimated that the

population of the peninsula was seven million, while scholars have estimated that by the end of the Goryeo period in the fourteenth century the peninsula's population was somewhere between 5.5 million and ten million.

Extant census data from the Joseon Dynasty (1392–1910) period is relatively abundant. Through this material, we can paint a general picture of population trends during the Joseon period, and see that between the fifteenth and sixteenth centuries the peninsula's population steadily increased, something attributable to advances in agricultural production and the relative peace that characterized the period. From the late sixteenth through the early seventeenth centuries, Korea suffered through two large-scale conflicts: the so-called *Imjin Waeran*, or Japanese Invasion of Korea (1592–1598), and the *Byeongja Horan*, or Manchu Invasion of Korea (1636–1637). The result of these conflicts was a significant drop in the population of the peninsula. Following this, up to the nineteenth century we see a pattern of rising and falling in the population. Overall, this period saw a cumulative rise in Korea's population; but epidemics, social turmoil, poor harvests, and famines brought on by natural disasters did result in elevated death rates for certain periods and concomitant drops in the population.

In sum, Korea of the Joseon Dynasty was a typical agrarian society and as such had both high birthrates and high death rates, so its population levels were fairly stable and exhibited only incremental increases. During the Joseon Dynasty, it is estimated that the crude birth rate (the number of births per thousand people over a given period, usually a year) held steady at the high rate of thirty-five to

forty-five births, while the crude death rate is estimated to have also been high at thirty to thirty-five deaths per thousand people.

During the Japanese Occupation period (1910–1945)

The Korean Peninsula experienced a tremendous population change during the period of Japanese occupation. Starting in the late nineteenth century, Western medicine and medical facilities were introduced to Korea, and with the subsequent Japanese colonization these changes spread nationwide as sanitary conditions also improved. Thus, in the 1920s, Korea's death rate began to decrease while its birth rate maintained its high level.

This drop in the death rate and continued high birth rate resulted in a rapid natural increase in Korea's population. In 1915, the natural annual population growth rate was a mere 0.4 percent, while after 1935 it had increased to 2.0 percent. Thus, while the total population of the peninsula was around 17.4 million in 1910, by 1930 this was about twenty million, and a 1944 census gave the population as 25.1 million. In the course of thirty-four years—from 1910 to 1944—Korea's population had increased by 7.7 million. However, during this thirty-four-year period, some 3.3 million Koreans had also emigrated abroad, and so the total population increase was more like eleven million. The result of this rapid population increase was greater population pressures on the land, especially in rural areas, which experienced a variety of problems as a result. This was compounded by the Japanese policy of exploitation of Korea's rural economy, and as rural conditions worsened there began a mass exodus from the country's agricultural areas.

From national liberation to the present day

The population of the Korean Peninsula was further influenced by the nation's liberation, its subsequent division into North and South, and the Korean War (1950–1953). Following the peninsula's division into North and South in 1948, population data from North Korea has become very difficult to attain and what we have is of dubious reliability, so population changes on the peninsula since that time can only accurately be detailed for South Korea. In 1949, the population of South Korea was 20,166,756. Following this, despite the many North Korean refugees who fled to the South during the Korean War, the cumulative effects of human casualties from that war, as well as the loss of the densely populated regions of Gyeonggi-do and Hwanghae-do to the North, meant that the South experienced a total population decline of about 1.3 million. However, when the Korean War ended in an armistice, stability was restored and the population began to increase exponentially. By 1960, South Korea's population had reached the level that had been recorded for the entire Korean Peninsula just prior to liberation in 1945. During the years 1955–1960, despite the almost total lack of any social increase in the population (i.e., an influx of refugees or other population increases not attributable to domestic births), South Korea experienced its most rapid population increase, with an average annual growth rate of 3 percent, or some seven hundred thousand people a year. This population explosion can be attributed the post–Korean War "baby boom." The introduction of new medicines, antibiotics, and medical technologies also played a significant role in increasing the country's population by reducing the death rate.

This rapid population growth continued through the 1960s. In the period 1960–1966, annual population growth averaged 2.6 percent, and by 1967 South Korea's population had surpassed thirty million. Faced with this, the government initiated a population control policy to reduce the associated pressures. As part of this policy, in 1962, the government established a family planning program. Led by the central government, the family planning project had a profound impact on birthrates: by the late 1970s, the national population was increasing by only about six hundred thousand per year. During this period, the lower national birth rate accompanied a lower national death rate. This decrease in the death rate can be attributed to the

Table 2-1 Population of South Korea following liberation (1949–2010)

Year	Population	Sex ratio	Population density (people/km²)
1949	20,166,756	100.1	204.9
1955	21,502,386	100.1	218.4
1960	24,989,241	100.8	253.9
1966	29,159,640	101.4	296.4
1970	30,882,386	100.8	320.4
1975	34,706,620	101.3	351.1
1980	37,436,315	100.5	378.8
1985	40,448,486	100.2	408.8
1990	43,410,899	100.7	437.7
1995	44,608,726	100.7	449.4
2000	46,136,101	100.7	463.9
2005	47,278,951	99.5	474.5
2010	48,580,293	98.7	485.6

Source: Korean Statistical Information Service (http://kosis.kr)

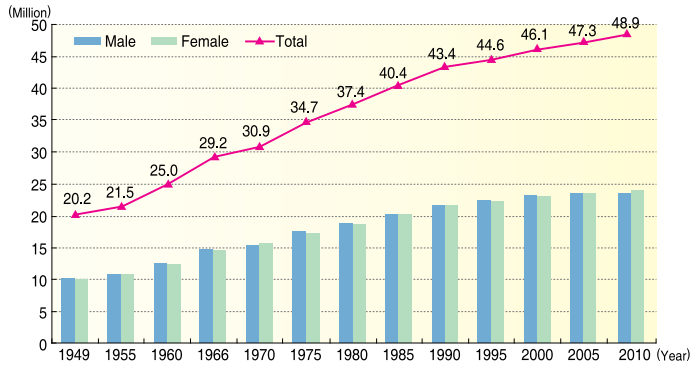

Figure 2-1 Population trends for South Korea (1949–2010)

country's advancing economic development and the resulting improvement in living standards, as well as to the expansion of health and medical services. The total population of South Korea was over forty million in 1984; the 2010 census revealed a total population of 48,580,293. Currently, South Korea's population is experiencing stagnant growth because the death rate has gradually declined but the birth rate has fallen much more rapidly. In the course of sixty years, South Korea has undergone a demographic transition, from a society with a high birth rate and a high death rate to one with both a low birth rate and a low death rate. This stands in sharp contrast to the much slower transitions that many Western nations underwent, which took approximately 150 to two hundred years.

Population Structure

Population structure refers to the composition of a given population and an examination of differences in the socioeconomic status

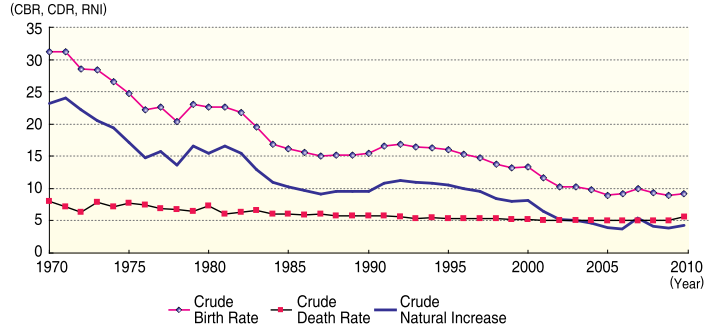

Figure 2-2 Crude birth rate, crude death rate, and population trends in South Korea (1970–2010)

of that population under certain temporal and spatial conditions. Population structure statistics can classify population according to various categories, such as sex, age, industry, occupation, social class, marital status, and education level. Among all these categorizations, the most fundamental in terms of population structure are sex and age.

Demographics of gender

In terms of population, gender is the most significant characteristic affecting fertility. When examining the gender structure of a given population, we speak of its sex ratio—that is, the number of males per hundred females. Since 1955, the sex ratio in South Korea has been generally balanced. Until 2000, there were slightly more males, with the ratio fluctuating between 100.1–100.4 males per hundred females. In 2005, however, females had the slight advantage with a ratio of 99.5, an advantage that by 2010 had increased to 98.7. These

most recent changes in sex-ratio statistics can be tied to the aging of the population. When breaking down the sex ratio by age, we generally find that at birth, the sex ratio favors males at about 105. Due to the higher death rate for boys and young men, it becomes more or less balanced by the time the children in question reach their twenties and thirties, and then gradually begins to favor females. Because women live longer than men, for octogenarians and older people the figure is forty men per hundred women or even lower.

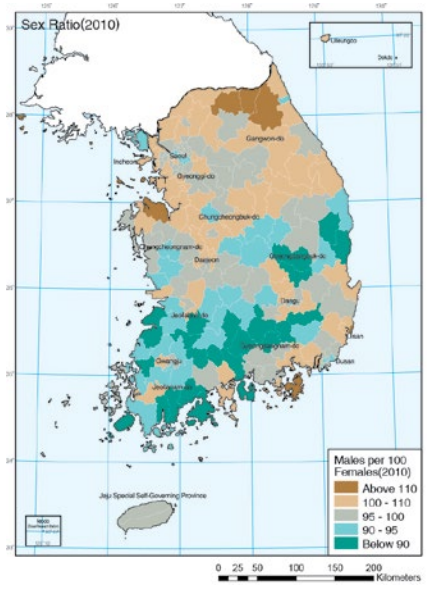

Figure 2-3 Regional breakdown of sex ratio for South Korea (2010)

Thus, although the overall sex ratio may be balanced, large differences open up when we approach it from an age perspective. Because Koreans have traditionally favored the birth of males, we generally see a higher sex ratio at birth compared with other countries. This continued into the 1990s, with the sex ratio at birth for 1993 standing at 115.3, though more recently this trend has abated and the sex ratio at birth for 2012 recorded 105.7.

Further, the sex ratio in a given age group can also show great variation between urban and rural regions. With increasing industrialization and urbanization in the 1960s, many rural residents migrated to cities, with rural young women in particular seeking working opportunities there. The result was a critical gender imbalance in the marriageable-age population of rural agricultural communities. In 2010, the sex ratio among twenty-five- to twenty-nine-year-olds in rural agricultural communities (understood here as those residing in townships) was 141.2, a reality that has made it extremely challenging for young men to find marriage partners in rural areas, and increasing the trend toward seeking foreign brides.

Regional variations in sex ratio can be attributed to the primary economic activity of the region in question. In regions with industries requiring typically male labor, such as the heavy chemical industry, more males can be found, while areas with more businesses that rely on typically female labor, such as those in the service sector, have more females.

Age-specific population structure

Changes in South Korea's age-related population structure over the last fifty years well illustrate the process of its demographic transition. In 1960, children under age fifteen accounted for 42.9 percent of the total South Korean population. By 2010, this figure had fallen significantly to 16.2 percent. Similarly, the elderly (those aged sixty-five and over) made up 3.3 percent of the population in 1960, but 11.3 percent by 2010, a 400-percent increase. This reduction in the population of children and the corresponding increase for

young adults and especially the elderly are related to modernization, industrialization, urbanization, falling birthrates, and lower death rates than in past years.

South Korea's aggressive family planning policy was effective in lowering its population growth rate, but the resulting low birth rate has, in recent years, become a serious issue. The total fertility rate refers to the average number of children a woman bears in her lifetime. In 2012, this number for South Korea was 1.3. If this trend continues, the drop in the country's productive population and the resulting economic stagnation will become critical concerns. Causes cited for this rapid decline in the fertility rate include women's changing role in society, the rising cost of maternity care and childcare, and a growing trend toward singlehood or late marriage. The plummeting fertility rate has meant the South Korean government has abandoned the birth control policy it had been pushing for over thirty years and implemented instead a variety of policy initiatives meant to increase the country's fertility rate.

The realities of a declining fertility rate and an aging population have become critical issues facing Korean society. In 2006, South Korea's elderly population surpassed 7.1 percent, making it an aging society. If this trend continues, it is anticipated that by 2026 the elderly will make up 20 percent of the population, making South Korea a "super-aged society." The primary factors in creating a super-aged society are a declining fertility rate coupled with an increase in the average lifespan due to medical advances. The fallout from this will not only include labor shortages and increasing welfare costs, but also have the potential to diminish social vitality and even give rise

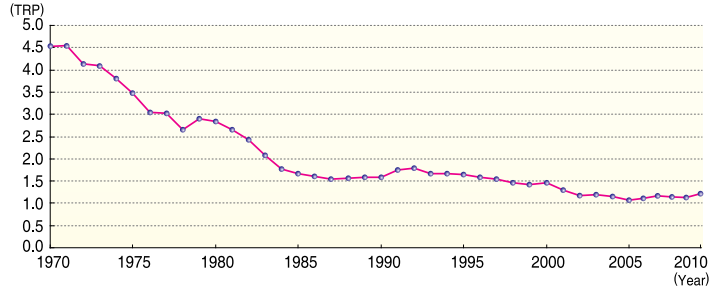

Figure 2-4 Changes in the total fertility rate for South Korea (1970–2010)

to intergenerational tensions and conflicts.

This being said, there is a difference between the age demographics of rural and urban areas. Because many young adults have fled the countryside for the city, the rural population tends to have a relatively high rate of elderly people. Conversely, urban areas tend to have relatively high concentrations of young adults.

Regional Distribution of the Population

Generally, population distribution is determined by natural conditions such as topography, climate, soil quality, and resources, along with such man-made conditions as politics, economics, and social and cultural factors. Climate, perhaps the most decisive factor determining the availability of resources on a global scale, can also be decisive within a single country. Particularly in countries or regions centered on agriculture, climate will have a profound impact on population distribution. In terms of topography and soil conditions, for instance, population will be much denser on flat and fertile plains or in water-abundant valleys than in barren mountains. With regard

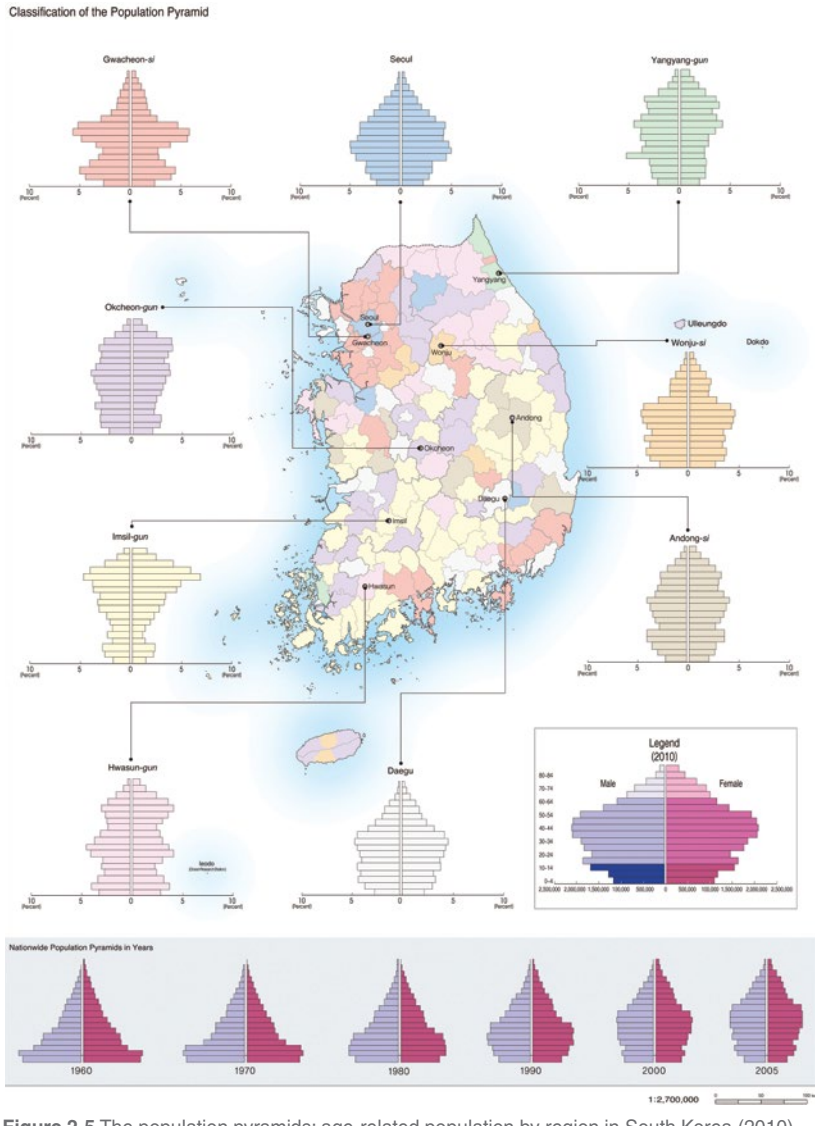

Figure 2-5 The population pyramids: age-related population by region in South Korea (2010)

to man-made conditions, the most decisive factors include the type and scale of a given society's economic activities, while the social and political climate can prompt people to move and thus influence population distribution.

Through the Joseon Dynasty (1392–1910), Korea was a traditional agricultural society and as such the population distribution depended heavily on the availability of agricultural land. Thus, in the plains and coastal areas of the southern and western portions of the peninsula, with their flat terrain and abundance of agricultural land as well as their milder climates, the population was denser; whereas in the mountainous regions in the north and east, with their colder climates and craggy, less arable terrain, the population was sparse. This situation had changed little by the modern era; however, with rapid industrialization and attendant urbanization beginning in the 1960s, a significant amount of the rural agricultural population migrated to the cities, resulting in overcrowded cities and metropolitan areas as well as the depopulation

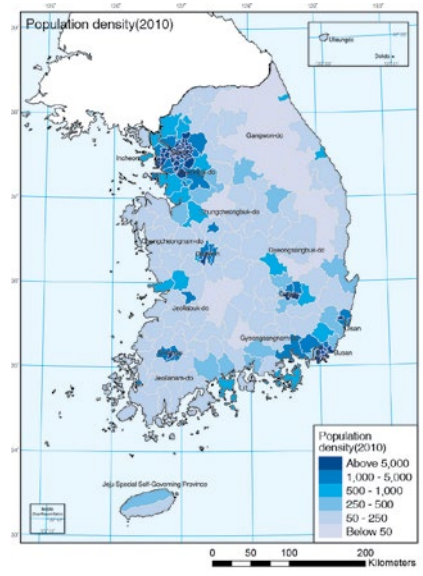

Figure 2-6 Population density of South Korea (2010)

of rural villages.

The urban-centered population trend continues to this day, with 91 percent of South Korea's population residing in cities in 2012. Particularly striking in South Korea's case is the concentration of the populace in the capital region. Here the capital region refers to the city of Seoul and its environs, including Incheon and Gyeonggi-do. Comprising only 12 percent of South Korea's total land area, this capital region is home to half of the country's population.

The population density index is the most common tool for comparing population distribution by region. South Korea's population density is 485.6 persons per square kilometer, making it one of the most population-dense countries on earth. A comparison of the country's different regions reveals that the coastal region and plains of the peninsula's southwest have a high population density, while the mountainous regions of the northeast have a low population density. The populace is especially concentrated in places like industrial cities, transportation centers, and large-scale residential "new cities."

Migration

Migration is driven primarily by political, economic, and social factors. There has been migration in Korea from the very earliest times, but a lack of data makes it very difficult to ascertain the patterns and nature of this migration. In premodern society the major drivers of migration included climate abnormalities, natural disasters, and war. Many people fled famine or epidemics brought on by natural disasters; others sought to escape wars and conflicts. What's more, circumstances forced many of these migrants to resettle on the frontiers

for purposes of national defense. During the Joseon Dynasty, the government moved many of its people from the southwestern region to the northern frontiers to bolster the nation's defense capabilities.

Internal migration

Liberation from Japan in 1945, national division in 1948, and the Korean War from 1950 until 1953: These three historical events resulted in the migration of peoples on a scale that has rarely been seen. Liberation in 1945 brought many Koreans back home after living overseas; national division triggered a wave of refugees from the North toward the South; and the Korean War increased the population of South Korea's large cities, as country dwellers sought refuge from the conflict and North Koreans defected to the South.

With rapid economic growth starting in the 1960s, the urbanization of South Korean society accelerated. The latter half of the 1960s witnessed a rural exodus toward urban centers, with over half of all migrants during this period moving from rural areas to cities. Migration to the country's large cities—namely, the capital region (primarily Seoul and Incheon), Busan, Daegu, Gwangju, and Daejeon, as well as industrial urban centers on the southeast coast, such as Ulsan, Pohang, and Changwon—proceeded at a brisk pace. Over the past thirty years South Korea's internal migration rate has averaged about 20 percent, very high compared with other countries such as Japan (5.3 percent), Taiwan (7.4 percent), and Norway (4.1 percent). However, if one examines this migration pattern more closely, one finds that it is more often a case of short-distance moves within the same city rather than long-distance relocations between cities.

Migration can be related to familial, economic, and educational factors, among others. For males, the primary factor is economic, whereas for females it is generally familial—women relocate either for purposes of marriage or as a result of the relocation of the head of the household. Education-related migration is very common in Korea. Korean parents place a very high value on education, resulting in migration to large cities where the best educational opportunities are available.

The unequal population distribution brought about by the growing concentration of the populace in cities has created a problem of inefficient land use. For South Korea, there is a growing need for effective population policies to address this problem.

International migration

In premodern Korea, international migration was very rare. In Korea, emigration began at the end of the Joseon Dynasty when destitute farmers migrated beyond Korea's northern frontier to Manchuria and Russia's Maritime Province. This migratory trend accelerated during the Japanese colonial period (1910–1945), when many Koreans fled to China and Russia to escape Japanese colonial exploitation. During the period 1903–1905, some Koreans also emigrated to Hawaii—then a U.S. territory—and to Mexico, as laborers. Korean immigration to Hawaii was soon discontinued under pressure from Japanese authorities, who wished to protect the Japanese laborers there. During the Japanese colonial period there was also some Korean emigration to Japan, particularly after 1939 when a military and labor conscription system was initiated; between a hundred thousand and two hundred thousand Koreans were mobilized to Japan annually. As mobilized labor they were sent to work in coal mines and industrial complexes. By the time of national liberation in 1945, the number of Koreans living overseas had reached about five million.

Even after liberation, international migration continued. The year 1962 marked a notable development with the passage of the Overseas Emigration Act. As emigration became a matter of national policy, rates of emigration increased. During the 1970s, with the collapse of South Vietnam and the deterioration of the political situation in South Korea, international migration increased further. For about a decade starting in the mid-1970s, over thirty thousand South Koreans per year emigrated abroad. After this, however, with the growth of the national economy emigration gradually dropped off. Looking at the distribution of ethnic Koreans residing overseas, the greatest numbers are in China, with about 2,489,000 Koreans living there as of 2010. This is followed by the United States (2,102,000), Japan (913,000), Canada (223,000), and Russia (222,000). The destination of most Korean emigrants since 1945 has been the United States.

Meanwhile, the number of non-Koreans immigrating to South Korea is on the rise. In 2006 South Korea had more incoming migrants than outgoing migrants. The majority of foreign residents of South Korea are migrant laborers or the spouses of Koreans as well as their children. Korean Chinese account for the largest number of these foreign residents. With the influx of foreign residents into Korea, the number of culturally mixed marriages is increasing, transforming South Korea into a multicultural society.

Villages and Rural Communities

The locales where people settle down to live can be categorized into rural and urban settlements. Generally, a settlement that centers on a single primary industry will be a rural settlement, while a settlement that has a sizable population centered on secondary and tertiary industries will be an urban settlement. The Korean term *maeul* (village) designates a rural settlement comprising single-family dwellings, and forms the basic unit of social life.

A rural settlement consists of houses and ancillary facilities, roads, waterways, agricultural land, forests, and religious structures. The features of a village will vary according to the natural environment, the primary industry or livelihood of its inhabitants and their social or cultural characteristics, and the historical development of the village in question. For instance, rural villages can be large or small in scale and can be regular or irregular in layout. Land and dwelling use can also vary depending on whether villagers are engaged primarily in agriculture or in the fishing and aquaculture industries.

Location and Features of Rural Villages

The physical place where a rural settlement is situated is termed its location. A settlement's distinguishing features will vary according to its location. Rural settlements located on wide and flat plains will for the most part exhibit agricultural features, while those situated on seacoasts will largely be engaged in fishing. Meanwhile, rural settlements located in mountainous areas will have more varied features incorporating forestry and agricultural activities.

Farming villages

As the name implies, the inhabitants of farming villages—which comprise the bulk of South Korea's rural settlements—are dedicated primarily to agricultural work. The population of South Korea's farming villages has dropped precipitously from historical levels, and though agriculture's role in the South Korean economy as a whole has declined, farming villages remain important.

Because such factors as topography, climate, and soil conditions play such a critical role in agriculture, a farming village's location is intimately connected with the natural environment, especially as concerns the distribution of arable land and water supply. In Korea, the clearing of agricultural land first took place on hills along minor rivers rather than on the alluvial plains of major river basins. This avoided the dangers of flooding while maintaining easy

Figure 2-7 Farming village in Goseong-gun, Gangwon-do

access to water. Later, with the development of water management technology, agriculture expanded to the fertile alluvial plains along major rivers.

Thus it is that so many of Korea's farming villages are located in the hills—more specifically, at the feet of hills or mountains—though there are also cases of farming villages situated deep within carved-out valleys. In Korea, such a location is the traditional setting for a rural village, following the custom of *baesan imsu*, or "mountain in the rear, water in the front." The village is typically situated on a gentle south-facing slope where the mountain meets the plains. In this way it not only receives the full sun but the water table is also low, making potable water easy to acquire while also putting the village out of danger of flooding. What's more, such a location offers protection from the northwest monsoon winds in

Figure 2-8 Rice farm in Gimje-si, Jeollabuk-do

winter while the mountains to the rear provide a source of firewood, building materials, and a variety of foods. Along the river or stream flowing in front of the village are found banks suitable for farming. By the tenets of feng shui (*pungsu* in Korean), which play such an influential role in determining the locations of rural settlements, this type of location is considered propitious. Even after agricultural activities were extended to the alluvial plains of large rivers, there was little change in the locations of the villages themselves. Though farming could now take place on the alluvial plains, the typical village was still situated in the foothills at the periphery of these plains. This choice of location helped protect it from floods.

Rice cultivation has long been the primary activity of most of Korea's farming villages. The typical features of such farming villages include the wet paddies for cultivating rice and the irrigation facilities such as reservoirs and waterways that supply them with water. In order to improve operations, from the 1970s agricultural fields began to be made square and agricultural roads constructed to connect village with farmland. Within the individual village households are found storehouses for the harvest and farm equipment. A large central courtyard used for a variety of farming-related tasks and operations is another particular feature of village homes.

Fishing villages

The residents of fishing villages make their primary living in fishing-related industries. As a peninsula, surrounded on three sides by the sea, Korea is abundant in fishing villages. However, rather than relying entirely on fishing, many of Korea's fishing villages get their livelihoods partly from fishing and partly from agriculture.

Many fishing villages are situated on low, rocky coasts. These rocky coasts are found not far from mountainous hinterland, and through long erosion by waves the bedrock has been exposed. Thus, compared with the wide sandy beaches found on sandy coasts, the waters here are deep, making the launching of fishing vessels convenient. The nearby seabed abounds in reefs, the habitat of shellfish and seaweed, while the sea itself is rich in sea life, giving such locales the ideal conditions for the development of fishing industries.

More specifically, Korea's fishing villages have developed on narrow plains at the embayment between headlands protruding out to sea. In this way the headlands act as natural breakwaters, protecting the settlement from rough waves and high winds. During extreme weather conditions such as typhoons, they protect the fishing vessels, while even under normal conditions they act to keep the coastal waters tranquil. Further, many fishing villages face south and are

Figure 2-9 Fishing village in Uljin-gun, Gyeongsangbuk-do

situated in valleys surrounded on three sides by mountains or hills with only one side open toward the sea. The surrounding hills serve as good resources and the village's orientation gives it ample sunlight, which is useful in the drying of fish or seaweed. In the past, many rural settlements that were situated on sandy coasts were dedicated more to agricultural activities than to fishing. Because of their sandy beaches, not a few of these villages are now popular tourist spots.

Some of the major features of fishing villages are docks and marinas for the boats, breakwaters, and lighthouses; while in those villages that focus on tourism, one sees beaches, restaurants, inns, and parking facilities. Village dwellings are typically on slopes overlooking the village port area, while surrounding the homes can be found small-scale agricultural plots. The homes in fishing villages are smaller than those in farming villages and have narrower yards. This is because most activity takes places at sea or on the coast, and so the home is only a space for rest.

Mountain villages

With mountains comprising almost 70 percent of its territory, Korea naturally has many mountain villages. But it is difficult to distinguish mountain villages from farming villages, since there are many mountainous regions where farming is still the main industry; few villages in mountainous regions have industries based on mountain resources, such as forestry or mining. Mountain villages are found in areas with extreme variations, and even villages within a given geographical range may have very different natural conditions depending on altitude. Because of this, a given mountain village's

primary activity will vary by location.

Compared with farming villages, mountain villages face adverse weather and farming conditions and poor transportation links. In the past, agriculture in these areas was usually limited to subsistence farming, augmented perhaps by some cash income derived from timber production or the collection of firewood.

Major change came to these mountain villages in the 1960s with the country's natural resource development initiatives. In particular, mining villages formed around the development of coal and limestone mining in the Taebaek Mountainous Region in the country's eastern region. With the expansion of rail and road networks in this area for the transport of anthracite and cement, the region experienced more diverse development than the typical mountainous region. The cool summer climate favored highland agriculture and the cultivation of crops such as radishes and cabbage, while the creation of grasslands for the raising of such livestock as beef and dairy cattle is also on the rise. More recently, the tourism industry, taking advantage of the region's unspoiled natural environment and beautiful scenery, has experienced rapid growth. The expansion of the sports and leisure industry in mountainous areas, bringing with it ski resorts, recreational forests, and condominium development, is also bringing major changes to life in the mountain villages.

The positioning of mountain villages does not differ much from that of farming villages. Because living conditions become increasingly austere as one gains altitude, at least in South Korea villages are rarely found over 1,000 meters above sea level. Further, because the period of daylight is briefer in mountainous regions, directional placement

is more crucial here than in the farming villages on flatter terrain and most mountain villages are oriented toward the south. The homes in mountain villages are typically situated on small plots and on sloping ground. Because the temperatures in these areas are relatively low and the winds harsh, homes are usually enclosed. The work that in a farming village is usually carried out in a home's courtyard is, in a mountain village home, done inside the house. In more traditional times, even the livestock barn was located within the home.

Form and Structure of Rural Villages

The rural village constitutes one type of human planning project in response to the natural environment. Accordingly, the village's spatial form and structure represent the distinctive character of its inhabitants. The form and structure of a village will vary according to the natural environment of its location, historical background, socioeconomic factors, and the values and lifestyle of the villagers themselves.

Village forms

Villages can be classified into clustered rural settlements (i.e., those with homes built close together) and dispersed rural settlements. Clustered rural settlements can be further subdivided according to their road networks and geometric layouts into compact villages, row villages, and street villages.

Korean rural villages are largely clustered rural settlements. The primary reason for the formation of clustered settlements has to do with topography. Most rural villages in Korea are found in valleys or foothills, where land for building homes is limited compared

with the plains, and for this reason homes here tend naturally to be concentrated. What's more, locations that are safe from flooding and which have easily accessible drinking water are also limited. The limited availability of sites considered auspicious under the principles of feng shui (*myeongdang* in Korean) was an additional factor. .

The scarcity of land and the cooperative culture of farming communities were other major influences in the "clusterization" process of rural settlements. The time savings and labor efficiency that result from village homes being situated adjacent to, or even amid, the village farmland, is self-evident, and thus having homes that were dispersed would be of little use. The Confucian culture that permeated village life as well as the large number of single-clan villages were other contributing factors. Finally, with the passage of time and accumulated history, the formation of clustered settlements was encouraged more and more. Put another way, a village with a long history is more likely a clustered settlement, whereas a village with a short history is more likely a dispersed settlement.

By contrast, dispersed rural settlements in South Korea are more or less limited to places like the Taebaek Mountainous Region in Gangwon-do, the Taean Peninsula in Chungcheongnam-do, and orchard communities on Jejudo Island. Dispersed rural settlements not only have shorter histories than clustered settlements, but are also generally engaged in dry-field farming. Rather than geometrically shaped, most clustered rural villages are irregular in shape. Homes in the typical compact village are packed closely together and separated by walls or fences with narrow and winding alleyways running between them. Though the houses are small, their courtyards are

Figure 2-10 Clustered rural settlement in Muju-gun, Jeollabuk-do

relatively expansive. The reason is that, over time, homes were built to fit in with the appearance of the land. This type of clustered village developed in harmony with its surroundings and with nature.

Row villages are situated in foothills or along the coasts and follow natural features, roads, or waterways. Among these, those rural settlements that have a particularly close relationship with the road and which are formed parallel to it are termed street villages. Korea does not have many rural settlements of the row village type. Row villages can be seen among some of the planned communities found in coastal areas on reclaimed land.

Street villages, which form along roadways and which are en-

gaged primarily in commercial activities, less common in Korea than in other countries. In traditional Korean society commerce was downplayed, the management of the country's roadways was neglected, and much of the populace lived away from the main roads. Moreover, in traditional Korean society, many viewed roads as avenues of infectious diseases, malevolent spirits, and ideas that undermined public morals. As a result, the formation of street villages did not really begin in Korea until the eighteenth century with the rapid development of national commerce.

Village structures

It is difficult to generalize about the structure of rural settlements as they can differ from community to community. That said, if one looks at those shared elements of Korean traditional villages, one often finds that to enter a village from the outside world one first had to cross a stream or pass over a hill. Though often such an approach was the natural and inevitable result of the principle of "mountain in the rear, water in the front," which played such a decisive role in the choice of village location, it was also not uncommon for villages to intentionally plan it this way. This is because, by compelling the traveler to pass by and stop for a moment at a site sacred to the village, the villagers were imposing a sort of rite of passage.

The village entrance had spatial elements that carried symbolic meaning, elements that harmonized aspects of indigenous folk beliefs, *pungsu*, and Confucianism, all of which profoundly influenced Korean traditional modes of thought and ways of life. In terms of *pungsu*, there was the selection of the auspicious spot—one that best channeled and captured positive chi energy—for the village's

Figure 2-11 *Jangseung*, or village guardian totems, in Gwangju-si, Gyeonggi-do

location. From the aspect of indigenous beliefs, one could find such features as *dolmuji* (stone mounds just outside the village that prevented calamities), *sotdae* (a sort of sacred pole for communicating with the heavens), *jangseung* (village guardian totems), and either a solitary *nogeosu* (literally, an "old and enormous tree" that was considered sacred) or groves of sacred trees. From the aspect of Confucianism one could find such things as steles to honor filial behavior or chaste and loyal women, erected to both educate and inspire the village residents in Confucian ideals of filial piety and loyalty or to display village exemplars of such behavior to any outside visitors. Among these elements, the *dolmuji*, village guardian shrine, and sacred tree, as symbols of the village's hopes for peace and prosperity, were also sites where the villagers would gather

every year to offer up prayers and make sacrificial offerings. Though such symbolic village features could vary somewhat in their configurations from village to village, most villages had at least one such element—more often, they had two or more. Among these, perhaps the most common feature to be seen at the entrance to a traditional Korean village was the sacred tree or grove. These not only held symbolic meaning but were places for the villages to gather for relaxation or recreation, or to hold councils.

Moving to the village interior, what is immediately noticeable is that the village's center or highest point is occupied by its largest home. This is because the village's wealthiest residents, and those with the highest social status, occupy the most geographically advantageous—or, from a geomancy perspective, the most auspicious—locations. In what is termed a clan village (where most residents belong to extended branches of the same clan), this location is usually occupied by what is called the *jongga* (literally, "lineage house")—the home belonging to the head family of the clan in question. On the other hand, the homes of residents of lesser socioeconomic status are located on the village periphery and on relatively lower ground. Thus in traditional times it was possible to distinguish the two groups by reading the landscape.

The village also contains communal space, of which the most representative is perhaps the village well. As the source of the village's household water, the well was of critical importance, and it was not uncommon for villages to form around wells. The well was also a site for the village women to interact socially and exchange important news.

A clan village will clearly distinguishable structures, such as the village shrines, pavilions, and schoolhouse. Village shrines were sites for memorializing and performing rites for ancestors—displays of loyalty, filial piety, or scholarship—and as such were typically located in the village interior. Pavilions, as sites of recreation and study, were usually situated in scenic and tranquil spots along streams or woods a short distance from the village. The village schoolhouse, or *seodang*, was established with the aim of educating the children of the clan. Though this structure had a clear and important practical function, it also served to display the prestige of the village and the authority of the village's leading families to outsiders.

Figure 2-12 Village pavilion in Damyang-gun, Jeollanam-do

A traditional Korean village is typically situated on the side of a hill or mountain. One will often notice that the mountain or hill behind the village is scattered with grave mounds shaped to resemble

a Korean mountain.

The landscape of the traditional Korean village began to change with the urbanization and industrialization of the 1960s. In particular, the "New Village Movement" (Saemaeul Undong) of the 1970s saw the reconfiguration of the village's traditional landscape. The entry points to villages, along with village streets, were expanded and straightened and the village entrances underwent major changes, with many of their traditional symbolic features lost and new ones taking their place—for example, village meeting halls, communal warehouses, and community centers for elderly residents. Clan villages in particular suffered severe population drains due to urbanization, even as changes in social values resulted in the severe weakening of clan ties. Many village structures like shrines, the village *jongga*, and pavilions, were left devastated, falling into neglect and losing their roles as symbols of clan prestige and authority.

Changes in Rural Settlements

With Korea's rapid industrialization starting in the 1960s, many residents began leaving villages for cities. With the ever-growing rural exodus and the increasing population concentration in cities, not only did an urban-rural economic gap open up, but so did gaps in other areas such as culture and education. Though this has obviously meant tremendous changes in village life, these changes have differed for villages situated in the environs of urban centers and those situated far away.

Rural settlements near urban centers

Urbanization and industrialization had a tremendous influence on those "suburban villages" located in the environs of urban centers.

Most importantly, there was large-scale construction of factories, warehouses, and residential buildings. The population of such villages has seen an increase with the establishment of stores, financial institutions, and other such service-related businesses. In particular, along the main roads linking suburban villages to cities one can find a concentration of service businesses such as large department stores, other retail stores, and restaurants.

If urbanization proceeds in this way, land prices in these suburban villages increase. Farmers end up selling their agricultural land to build rental housing units, and they either abandon farming altogether to commute to the urban center for work or else become part-time farmers. The homes and lifestyles in the village eventually differ very little from those in the nearby city.

Meanwhile, to cater to the nearby urban residents, the suburban village farmers began the intensive cultivation of fruits, vegetables, and flowers. To this end, greenhouses and hothouses are erected on agricultural land near the city to provide a variety of products to the city residents throughout the year.

Rural settlements far from cities

In villages located far from city centers one typically finds residents with strong bonds, the result of living communally through the generations. Residents here traditionally collaborated to carry out any number of village activities, from farming to weddings and funerals. However, with urbanization many of these villagers left for the city, resulting in great changes in village life. The attrition of the young adult population in particular has meant the serious aging of such village populations. With depopulation it becomes extremely diffi-

cult for the villagers to maintain their standard of living, and village production drops off significantly.

The further that a village is from a city, the more serious such problems become and the less use it gets out of its arable land. What's more, schools see their student numbers plummet or close altogether. Hospitals, retail shops, and cultural facilities can close down or relocate, and with the cancellation of bus service living conditions in the village become even worse. If the symptoms are serious enough, the result can be the devastation of the entire village.

A number of measures have been presented to deal with these problems. Plans have been introduced to resolve the income gap between urban and rural areas and to attract public facilities and resources related to education, culture, and medical services. Most recently, the rising consumer trend toward environmentally friendly agricultural products has spurred an increase in organic farming. There is even a tourism market catering to city dwellers who wish to get closer to nature, or to experience life in a traditional rural village. Many villages are now boosting their incomes by targeting this tourist market—for example, by operating inns or tourist farms. With the rise in farmer incomes, we are even seeing a rise in reverse migration from the city back to rural settlements.

Cities: Concentrated Metropolitan Regions with More Apartment Complexes

In Korea, an area with a population of over fifty thousand people is designated a city, while an area whose population surpasses one

million is a metropolitan area. As of 2010, Korea has two special autonomous cities (Seoul and Sejong City), six metropolitan areas, and seventy-five designated cities. The population of these cities and metropolitan areas amounts to some 85 percent of the country's total population. Meanwhile, as of 2010 there were 214 *eup* (sometimes translated as "township"), areas with urban infrastructure and facilities but with populations between twenty thousand and fifty thousand. The combined populations of both cities and townships amounts to about 89.6 percent of South Korea's total population, reflecting the trend toward much greater urbanization than in the past.

Urban Population Distribution Highly Concentrated in Metropolitan Areas

When one looks at the population of South Korea's urban areas, what stands out is the degree to which the population is concentrated in Seoul and its environs. For example, the capital region comprises Seoul, Gyeonggi-do, and Incheon. Though this area makes up only about 11 percent of the nation's territory, it contains about 50 percent of the country's population. Next are Busan, Ulsan, and Daegu, large cities in the Yeongnam region (meaning Gyeongsangnam-do and Gyeongsangbuk-do), followed by Daejeon, Cheonan, and Cheongju in the Chungcheong region (Chungcheongnam-do and Chungcheongbuk-do), and then the relatively smaller cities of Gwangju (Jeollanam-do) and Jeonju and Iksan in Jeollabuk-do.

Looking at the distribution of cities as of 2010, several features stand out. First, we see increasing numbers of major cities growing toward metropolitan status, such as Incheon Metropolitan City,

Daejeon Metropolitan City, and Gwangju Metropolitan City, as well as gaps in the living areas that are centered on these major urban centers. Second, we also notice a Seoul–Busan urban corridor, with urban centers forming along this axis; and third, we see the heavy urbanization of the capital region (centered on Seoul Special City). These peripheral urban centers reflect suburbanization—the dispersal of dwellings, and along with them services and government-related infrastructure, to the areas outlying the capital.

The remarkable growth of the capital region has resulted in more opportunities there in terms of education, jobs, income, and a host of other services relative to other areas, as well as its accessibility due to its transportation linkages with other urban areas. Due to the concentration of the population in the capital region as well as that region's advantages compared with other regions in terms of services, real estate prices in the capital region have increased, triggering a wave of real estate speculation. Additionally, the concentration of the population in the capital region has resulted in traffic congestion and serious air pollution, the reduction of leisure space, and a deterioration in overall quality of life. Therefore, it is vital that efforts be made to strike a balance between the capital region and other areas in terms of development.

With the aim of dispersing the concentrated population of the Seoul capital region and promoting the balanced development of the country, policies have been enforced to curb the population growth of the capital region. In 1990, a policy was initiated to disperse central government administrative offices to Daejeon and in 2009 some ten government agencies were moved to the Daejeon Government

Complex. These included Statistics Korea, the Korea Intellectual Property Office, and the Military Manpower Administration. In 2003, then-President Roh Moo-hyun had established the Special Law for the New Administrative Capital with the aim of relocating the capital entirely to Daejeon. However, South Korea's Constitutional Court ruled this law unconstitutional, stating that such a move could only come about through a constitutional amendment. Consequently, the government pushed ahead with amended plans for the construction of a multifunctional administration city called Sejong City (named after one of Korea's most celebrated monarchs), and in 2012 Sejong Special Autonomous City was formally founded.

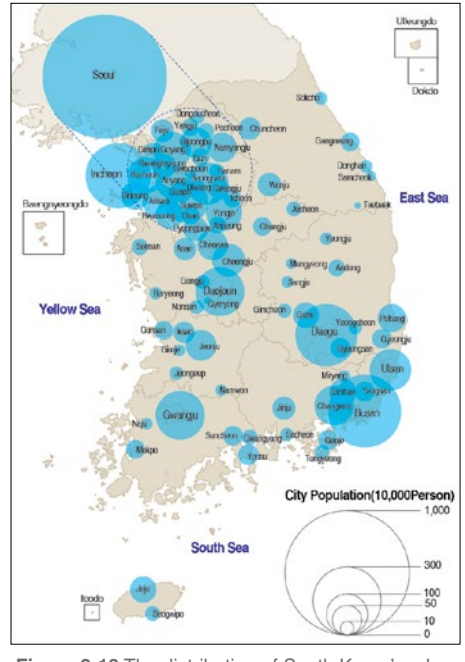

Figure 2-13 The distribution of South Korea's urban population

Urban Structure

Due to the restrictions imposed by distance in traditional times,

Korea's urban structure in the past consisted of large cities that formed the centers of somewhat independent regions with their own hinterlands. But, gradually, with the development of communication and transportation, this hierarchical system of cities weakened and the capital region emerged as the nation's undisputed center. In particular, as the country industrialized and its industrial urban centers underwent rapid growth, their economic structures increasingly began to emphasize service industries, thus weakening them relative to the capital. As the high-value-added service industries grew stronger within the Seoul area, the country's other major cities saw their advanced industries grow comparatively weaker, thus eroding their status as powerful urban centers within their respective regions.

Looking at Korean cities in terms of population, in 1970 the most populous was Seoul, followed by Busan, Daegu, Incheon, Gwangju, Daejeon, Jeonju, Masan, Mokpo, Suwon, and Ulsan. With the exception of Incheon, whose status as a large city was closely tied to that of neighboring Seoul, the country's large cities were spread out across the country in their own self-sufficient hinterlands. Jumping ahead to 1990 and 2010, we see that by 1990 Seoul had experienced more rapid growth than other cities, but also note the rapid growth in the populations of Incheon, Gwangju, and Daejeon, as well as the emergence of new major cities like Ulsan, Bucheon, Seongnam, and Suwon. Ulsan, Bucheon, and Suwon were industrial cities, outgrowths of the country's industrialization. Seongnam's situation as part of the capital region played a role in its population growth, while in Suwon population growth was spurred by industrialization

and the resulting influx of people. Meanwhile, traditional regional cities such as Chungju, Cheongju, and Gongju, and cities that emerged out of the development of rail networks, such as Daejeon and Cheonan, lagged behind and saw no major growth. In contrast, cities connected to the capital region, such as Asan and Cheonan, experienced growth as a result of overcrowding in the capital and the resulting relocation of people and services along with advancements in transportation and communications.

By 2010, further variations in the rankings of Korea's major cities were apparent, with Incheon overtaking Daegu and Gwangju being surpassed by Daejeon. Meanwhile, cities like Ulsan, Suwon, Changwon, Seongnam, Goyang, and Yongin emerged as major cities. With regard to metropolitan areas, figures reflect the continuing growth of the capital region, while Daejeon also saw growth due to the development of transportation links that allowed it to take on some of the nearby capital's administrative functions and

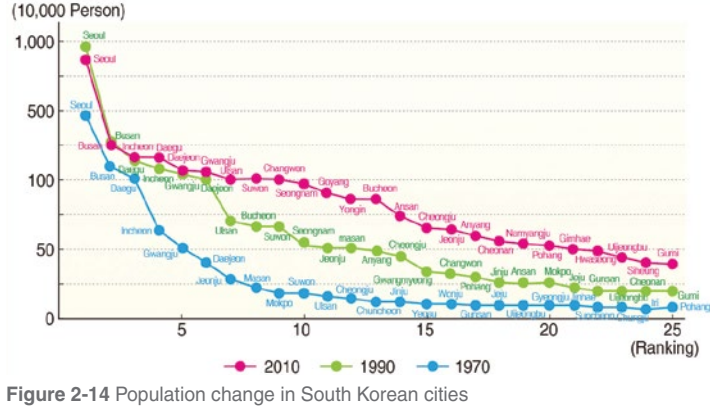

Figure 2-14 Population change in South Korean cities

research facilities.

Seoul is the country's primary city and its undisputed center, with a population more than double that of its second-largest city, Busan. Seoul's expansive growth has made it the country's business and commercial hub, while the major regional cities have become peripheral regions, and small cities have been relegated to a subordinate role, such that a centralized hierarchical urban structure of "capital ▸ large metropolitan cities ▸ cities" has emerged.

Looking at the centrality index for Korea's cities (Table 2-2), we

Table 2-2 How South Korean cities rank on the Centrality Index

Rank	Centrality Index Score	Urban Center
I	100 and above	Seoul Special City
II	36.16	Busan Metropolitan Area
III	23.4-12.87	Daegu Metropolitan Area, Incheon Metropolitan Area, Gwangju Metropolitan Area, Daejeon Metropolitan Area
IV	8.92-3.37	Ulsan Metropolitan Area, Suwon, Seongnam, Bucheon, Cheongju, Jeonju, Anyang, Goyang, Pohang, Changwon, Ansan, Cheonan, Masan, Jeju City, Jinju, Gumi, Pyeongtaek
V	3.11 or below	Yongin, Gimhae, Wonju, Uijeongbu, Mokpo, Chuncheon, Gangneung, Yeosu, Gyeongju, Suncheon, Siheung, Iksan, Gunsan, Hwaseong, Chungju, Namyangju, Yangsan, Andong, Gwangmyeong, Geoje, Gyeongsan, Paju, Gunpo, Icheon, Guri, Asan, Gimpo, Jecheon, Tongyeong, Pocheon, Seosan, Gwangju, Gwangyang, Gimcheon, Nonsan, Yeongju, Sokcho, Jinhae, Gongju, Donghae, Anseong, Sacheon, Jeongeup, Yangju, Boryeong, Seogwipo, Miryang, Sangju, Osan, Yeongcheon, Namwon, Hanam, Naju, Mungyeong, Gimje, Samcheok, Dongducheon, Uiwang, Taebaek, Gwacheon, Gyeryong

Centrality Index scores are calculated on the basis of a city's location and facilities.
Source: National Geographic Information Institute, 2010

see that Seoul and Busan are the leaders, followed by four metropolitan cities; these are followed in turn by a group consisting of Ulsan, six cities on Seoul's periphery, and eleven regional cities; and finally by subregional urban centers.

Korea's urban system has developed into a centralized system with Seoul as the clear focus. But with advancements in communications and transportation, accessibility is improving and connectivity is becoming more important than a hierarchical urban structure.

Urban Features

Korea's cities have by and large evolved into administrative centers, providing a variety of services to the surrounding areas. The majority of cities have developed into consumer or commercial cities with very developed administrative and business infrastructures, while since the 1970s the importance of their industrial capabilities have also grown. With industrial development came rapid population growth as people migrated from the countryside to the cities, creating large metropolises, centralized service providers with specialized functions.

Looking at a breakdown of cities by major industry (determined by calculating the number of residents employed in it; see Table 2-3), one notes that major manufacturing centers are Gumi, Changwon, and Gimhae in the country's southeast industrial region as well as cities located in the capital region of Seoul. Hwaseong is a particularly important manufacturing center with chemical, machinery, and automobile factories. Cities with a high concentration of commercial activities, to include producer services, include Seoul, Gwacheon,

Suwon, and Daejeon, due in large part to Gwacheon's and Daejeon's connections with Seoul and Suwon, respectively, as administrative centers. Though in terms of specialization the financial and insurance industry does not stand out relative to other industries, Seoul, as a regional center, employs a relatively large number of workers in the sector, testament to its role as a regional service provider.

Cities with important consumer and wholesale and retail trade industries include Seoul and neighboring Hanam as well as regional urban centers, with Seoul serving as a retail center not only for its

Table 2-3 Dominant industries in South Korea's cities

Industry type	1 < Z < 2	2 < Z < 3	3 < Z
Manufacturing	Asan, Siheung, Gimpo, Gumi, Yangju, Yangsan, Pocheon, Geoje, Ansan, Gimhae, Changwon, Anseong, Pyeongtaek, Paju, Icheon, Gwangju	Hwaseong	
Commercial	Seongnam, Anyang, Pohang, Cheongju	Suwon, Daejeon Metropolitan City	Gwacheon, Seoul
Finance and insurance	Suncheon, Seoul, Jeju City, Tongyeong, Guri, Mungyeong, Mokpo, Masan, Gangneung, Andong, Jeonju, Chungju, Seogwipo, Jinju		
Wholesale and retail distribution	Mokpo, Guri, Sokcho, Seogwipo, Suncheon, Seoul, Yeongju, Jecheon, Andong, Jeonju	Hanam	
Food and logding (tourism)	Jeju City, Gyeryong, Boryeong, Chuncheon, Gangneung, Donghae, Mokpo, Taebaek, Jinhae, Gyeongju		Seogwipo, Sokcho

Cities sorted only by major industries

Source: National Geographic Information Institute, 2010

immediate environs but also for the more distant hinterland. The food and lodging industry is very important in the tourist spots of Seogwipo (on Jejudo Island) and the eastern coastal city of Sokcho; it also plays a key role in other cities with major tourist attractions, such as Jeju City, Chuncheon, Donghae, Jinhae, and Gyeongju.

Rather than a classification system based on a city's key industries, looking at a ternary plotting of cities according to major industries we find that about 48 percent of cities are primarily manufacturing-based, 35 percent are based on wholesale and retail distribution, and 17 percent fall into other categories, such as commercial or finance/insurance (Figure 2-15). However, the service industries are also important in major cities where producer service functions are significant.

However, with the exception of Seoul and Busan, the country's major cities fulfill most of the same functions. As a city grows, it tends to assume those functions necessary to meet the needs of the populace. For this reason, large cities typically develop into multifunctional urban centers while those cities that tend to be more specialized in their functions are small or midsized cities. Examples include

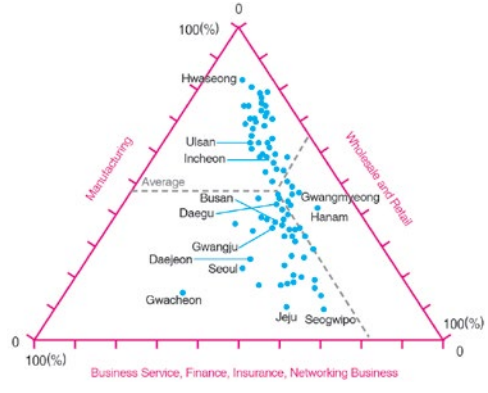

Figure 2-15 Ternary plot showing which industries are dominant in South Korea's cities

Hwaseong, which focuses on manufacturing; Jeju-do's Seogwipo, which specializes in retail and wholesale; and Gwacheon, which excels in producer services.

Korea's system of centralized urban centers emerged out of the rural-to-urban population shift that accompanied the country's industrialization. However, more recently, with the globalization of the national economy, the lowering of foreign production costs, and the expansion of international markets, Korean manufacturing has been moving overseas, and the reduction of domestic manufacturing has also slackened the pace of urban growth. With more recent advancements in transportation and communication along with job specialization, and the increased dominance industries that require face-to-face contact, we have seen a rise in the importance of producer services at the expense of manufacturing, with jobs in the latter sector dropping off severely.

With the movement of manufacturing overseas or to the peripheries of major cities domestically, the country's large cities are moving from production-based industries to consumer cities focused on retail, education and training, and residential apartments. Thus, the salient characteristic of Korea's urbanization today is the increasing concentration of producer services in major cities and the transformation of manufacturing cities into cities based on consumer services.

Urban Planning, the Urban Landscape, and the Characteristics of Korea's Cities Today

Among the distinctive characteristics of the Korean urban landscape today are such things as development-restricted greenbelts, new

cities, and urban renewal projects, urban planning trends that have emerged as part of an effort to promote sustainable development and improve the quality of life of urban dwellers.

Greenbelts are created to preserve the natural environment and ensure healthy living conditions for urban residents by protecting green spaces along the city's edge and controlling urban sprawl. To this end, areas are established on the periphery of cities where in principle there are strict regulations to control such things as the construction of new buildings, the extension of existing buildings, changes of property use, the subdivision of land, and alterations to the shape of the land. Such greenbelts date back to the early 1970s when they first began to be established in Seoul and then in large provincial cities. Since the early 2000s, however, some of these development restrictions have been gradually eased in favor of national-level or regional projects as means to improve living conditions.

One could cite Hwaseong, which dates to the Joseon Dynasty, as an example of Korea's earliest new town (or planned city), but the real development of planned cities commenced with the country's full-scale industrialization drive as a way of both fostering industry and alleviating overcrowding in the capital region. New towns like Changwon and Yeocheon were established to promote industry, while in new towns around the capital region large-scale residential complexes were constructed with the aim of resolving Seoul's housing problems. In the first phase of new town construction around the capital in the mid-1990s, Bundang, Ilsan, Pyeongchon, Sanbon, and Jungdong were built with the goal of providing two hundred thousand dwellings and bringing in 1.17 million total residents. The

Figure 2-16
Distribution of new towns in the Seoul vicinity (phases 1 and 2)

second phase encompassed ten new towns with 470,000 total residences and a combined population of 1.27 million.

The most recent planned city, or "new town," is Sejong Special Autonomous City, established as the new home for various central administrative departments and associated agencies as a way of relieving the excessive concentration in the Seoul capital region and as part of efforts to promote a more balanced national development. Further, as a way of encouraging regional growth, ten cities (Busan, Daegu, Naju, Ulsan, Wonju, Jincheon-gun, Jeonju–Wanju-gun, Gimcheon, Jinju, and Seogwipo) in "growth pole regions" were selected as innovation cities and sites for industry and the locations for public agencies previously in the capital region. To foster economic activity, five locations (Wonju, Chungju, Muan, Taean, Muju, and Yeongam-Haenam) were designated new towns and "enterprise cities" with the development there of industrial, research, and business facilities as well as sufficient residential, education, and cultural functions.

The urban landscape of major cities is often characterized by so-called greenbelts, areas on a city's periphery where development has been restricted in order to curb urban sprawl and preserve the natural environment. The establishment of greenbelts, dating back to the 1970s, has served to clearly differentiate the rural from the urban landscape; however, the restrictions on property rights for those residents living within such developmentally restricted zones created problems, and so in the early 2000s a gradual easing of such restrictions began. The result has been an urban renewal of the inner city, characterized by the construction of high-rise commercial buildings and apartments.

Starting in the 1950s, Korea undertook efforts to redevelop its inadequate housing but to little effect. In the 1970s, such urban redevelopment efforts took on a new vigor, and in the case of the central urban areas, where infrastructure was inadequate to the demands of rapid urbanization, there was a shift from a manufacturing to a service-based economy. The business environment was changing, and the response was the improvement of land use. The greater demand for commercial space and the presence of more cars meant a need for wider roads and more parking lots. Efforts were thus made to craft more efficient land-use policies and to procure more space for public facilities. Within city centers, aged facilities and residences were transformed into manufacturing and commercial areas. The focus was on meeting the increased demand for more comfortable

housing, improving quality of life, and expanding infrastructure through the redevelopment of residential space. In this way, city planners sought to address problems associated with older housing, as well as to improve the cities' image and urban aesthetics. This involved demolishing single-family dwellings to make way for the construction of new apartment complexes.

Poor and dilapidated residential districts were sometimes found in the central parts of old cities, but usually they were in hilly areas on the city's periphery (called in Korean *daldongne* or *sandongne*). Attempts were made to demolish and redevelop most of these areas, but this led to conflicts between developers and the original residents, not to mention the disintegration of traditional communities. For instance, consider the case of Nangok village, built on a steep hill in Seoul's Sillim-dong neighbourhood within the district of Gwanak-gu. The village's original population had moved there as a result of the government's 1967 policy of demolishing shantytowns. This population was then heavily augmented by migrants from the countryside. Its thirteen thousand inhabitants and 2,600 households were crammed into single-room dwellings along narrow hillside alleys, such that it was nicknamed the "neighborhood in the sky." In 1995, this neighborhood became the focus of redevelopment—the homes were demolished and replaced with apartment complexes. However, as the original residents were unable to afford this new housing, they ended up having to relocate. As a result, more recently, urban planning has taken a different tack.

Busan's Gamcheon village may be highlighted as an example of this newer approach to redevelopment, one which seeks to broaden

the participation of the original residents and help them resettle successfully and retain a sense of community by taking advantage of the existing dwellings. Gamcheon village was formed by refugees from the Korean War (1950–1953) who resettled on the hill by creating terraces, with the first generation of residents consisting of some three thousand households. In 2009, the village won the Ministry of Culture, Sports, and Tourism's "Village Art Project" contest and with the collaboration of artists and university students the village was designated a space for culture and the arts. The village's vacant homes were converted into book cafés and photo galleries, handmade sculptures were installed in its maze of narrow lanes, and the terraced homes were painted in pastel colors. Gamcheon village became an example of an alternative approach to the redevelopment of poor hillside neighborhoods, one that embraced renewal rather than simply renovation and helped to preserve the place's sense of locality.

Apartments have become the standard type of residence in Korean cities today and are a typical feature of the urban landscape. As of 2010, the percentage of apartment dwellings was significant: of some 17,320,000 total residences, 8,170,000 (47 percent) were apartments, while single-family homes numbered 8,870,000 (39 percent), multifamily homes 1,230,000 (7.1 percent), and townhouses five hundred thousand (2.9 percent). In Seoul, in 1985, apartments made up 26.1 percent of the total residences but by 2005 accounted for 54.2 percent, nearly doubling over the course of twenty years. Though the apartment penetration rate is somewhat high in Seoul compared with other areas, it is actually relatively low compared with Gwangju (70 percent), Ulsan (64.1 percent),

Daejeon (63.8 percent), and Daegu (60.1 percent). Since the 1990s apartments also began to change the landscape of small and mid-sized cities.

Korea's apartment phenomenon reflects its rapid modernization. The early stages of modernization saw the massive influx of the rural population into cities, where migrants were cramped into housing and home ownership for most was a fanciful dream. Even up to the 1970s, the type of home most favored by Koreans was a house with a small attached garden. However, with the gradual concentration of the population in major cities like Seoul, available land grew scarce and the construction of apartment complexes began. In the 1980s, Seoul began to build many high-rise apartment complexes aimed at the middle class so that gradually the apartment became that class's representative dwelling type. And as apartments began to appear conveniently near high-end shops and good schools, and to include various amenities, they acquired an image as modern and luxurious living spaces. Today, high-end apartments in Seoul and Busan that tower sixty floors or more high are regarded as luxury homes for the wealthy.

Large-scale construction of apartments is the most efficient means of providing housing in an environment characterized by high population density and steep land prices. High-density housing, such as apartment complexes, can be beneficial for people in low-income brackets; however, housing construction in Korea could not keep pace with urban population growth. This led to speculative investments in real estate and the standardization of apartment styles. Further, the government provided cheap land to the private con-

Figure 2-17 Gamcheon village in Busan's Saha-gu neighborhood
Left: the village in 1957 (Source: Gamcheon Cultural Village Museum)
Right: the redeveloped village in 2012 (Source: Busan Saha-gu office)

tractors; its role as credit guarantor has allowed for the large-scale supply of apartments. The demand for apartments pushed up prices, thereby increasing the returns on investment and spawning the construction of yet more apartments. After 2000, with the precipitous rise in housing prices in Seoul and the capital region, increasing numbers of households turned to bank loans to finance their home purchases, such that by 2012, some 63 percent of households were operating in debt. However, with the gradual drop in population growth, the retirement of baby boomers, and the economic recession, housing prices are seeing a drop and the original functional role of the apartment is returning. With the formation of such large-scale, densely populated apartment complexes, Korean cities are

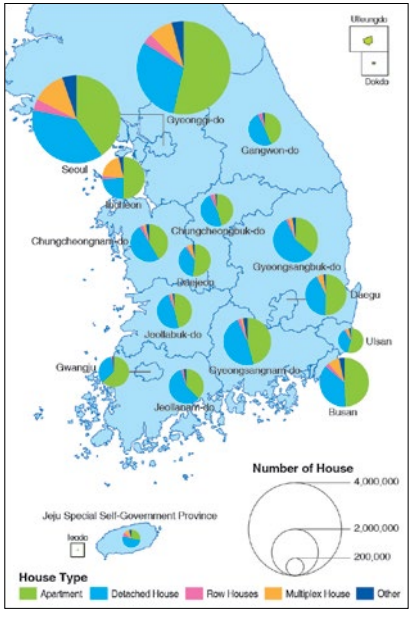

Figure 2-18 Kinds of housing in South Korea (2010)

seeing the emergence of self-sufficient apartment communities with their own individual education services. In major cities, attention is shifting toward the changing functionality and form of the city, with the rise of single-person households and the departure of some retiring baby boomers back to their home villages in search of a more satisfying lifestyle.

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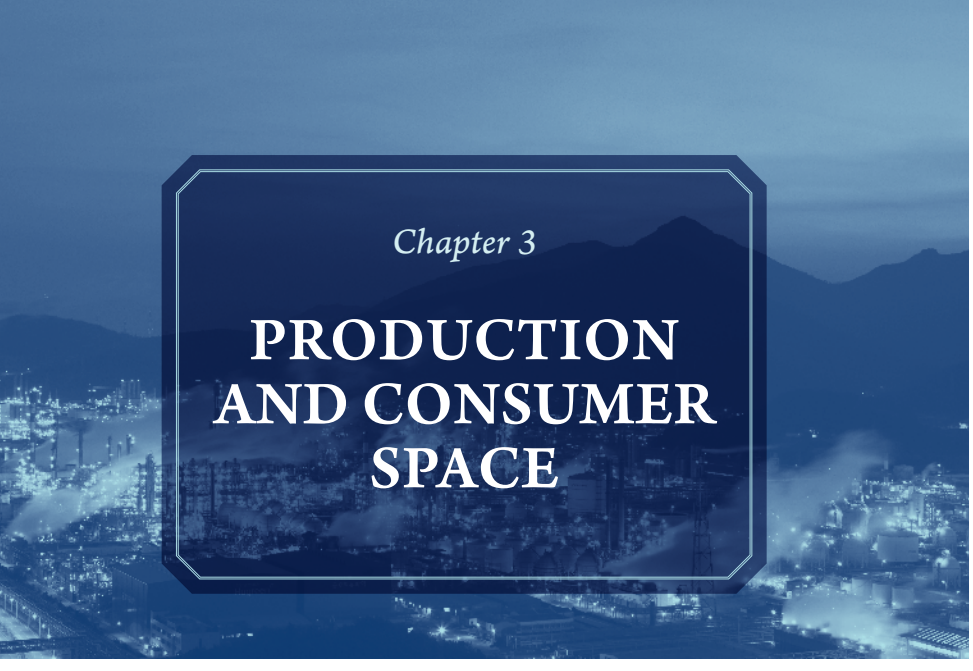

Chapter 3

PRODUCTION AND CONSUMER SPACE

Korea is perhaps unrivaled in the rapidity of its economic development. One of the world's poorest countries at the end of the Korean War in 1953, by 2011 its economy had grown to US$1.5 trillion GDP, the twelfth largest in the world. In the face of scarce natural resources, for which the country depends on external suppliers, Korea's economic growth can be attributed to a state-led policy of creating an export-driven manufacturing industry. This, along with domestic-oriented industries like agriculture, forestry, fisheries, and service industries providing basic daily necessities, constitute the entire Korean economy. Korea's production and consumer spaces may be distinguished in that the former involve the utilization of various resources to produce consumer products, while the latter are geared toward providing the various services necessary in daily life.

Resources and Energy: A Country Strapped for Natural Resources and Dependent on Foreign Supplies

Resources are vital as the basic component of economic development. Although it has a limited national territory and is not rich in natural resources, Korea has over long geological time been bequeathed a variety of mineral deposits. However, the majority of the peninsula's natural resources are metallic minerals such as iron ore and copper and are distributed largely in what is now North Korea, so that only a small portion of the key raw materials used in South Korea's steel industry are produced domestically, most being imported from places like Australia, Brazil, and India. However, nonmetallic minerals such as limestone and kaolin are relatively abundant in South Korea, with large deposits of limestone—a key component in cement manufacturing—found in Gangwon-do and Chungcheongbuk-do. Deposits of kaolin, used widely in the manufacture of such things as ceramics, refractory bricks, paper products, and cosmetics, can be found in places like

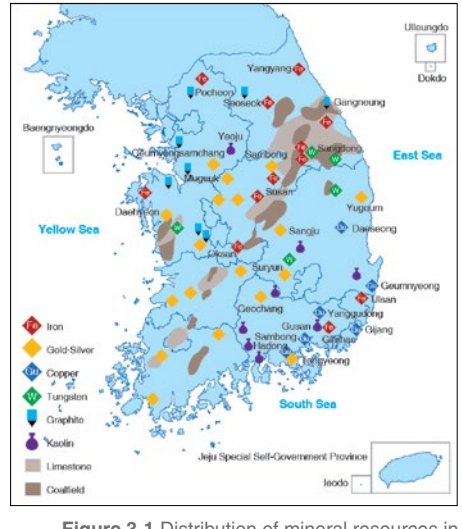

Figure 3-1 Distribution of mineral resources in South Korea

Hadong-gun and Sancheong-gun in western Gyeongsangnam-do.

Energy resources include such things as petroleum, coal, natural gas, and the newly emerging renewable energy, which is playing an increasing role in the country's energy structure. In terms of consumption levels, petroleum is currently the largest energy provider in South Korea, with supplies imported from Southwest Asia, followed by coal. Coal is a long-established energy resource and until the 1970s, when South Korea became a full-fledged petroleum-consuming nation, it was the country's most important energy resource. One significant development to come out of the oil crisis of the 1980s was the emergence of natural gas as an energy resource and the gradual reduction in petroleum use. Even today, coal, which remains the country's second-most-important energy resource, is used for thermal power generation in the form of bituminous coal, which is not produced in South Korea but imported from abroad. The once-vigorous production of anthracite coal, which in the form of coal pellets has household uses, fell off as deep mining and wages eroded profitability, and in the late 1980s the government implemented a coal industry readjustment policy aimed at cleaning up the economically failing coal mines through a focus on fostering economically efficient mines.

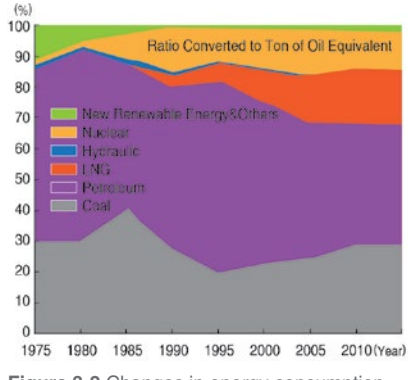

Figure 3-2 Changes in energy consumption (1975–2010)

Korea has seen a rapid rise in the use of natural gas, a result of advances in liquefaction technology, developments in transportation, the ease and affordability of its use, and the fact that it emits fewer pollutants relative to other fossil fuels. The Donghae-1 gas field in the seas off of Ulsan is a small-scale domestic producer of natural gas, but the majority of Korea's demand is met by imports and as demand increases efforts are being made toward developing a pipeline to import the gas directly from Russia. Let us now turn to the use of nuclear, new, and renewable energy as sources of electricity production.

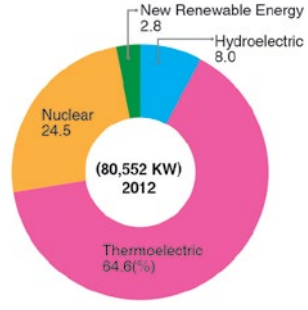

Figure 3-3 South Korea's energy mix (2012)

The majority of Korea's electrical power needs are met through thermoelectric or nuclear energy production, followed by hydroelectric production. New and renewable energy does provide some electricity but its contribution to the overall total is still minimal. One of the advantages of thermoelectric energy is that it can be produced in close proximity—in both time and space—to power demand, while the advantage of nuclear energy is its ability to produce power in large quantities and with minimal greenhouse gas emissions, which has resulted in increased demand. But due to the greenhouse gas emissions associated with fossil fuels and the risk of radioactive leaks associated with the disposal of nuclear fuel byproducts, there is a growing interest in new and renewable energy sources.

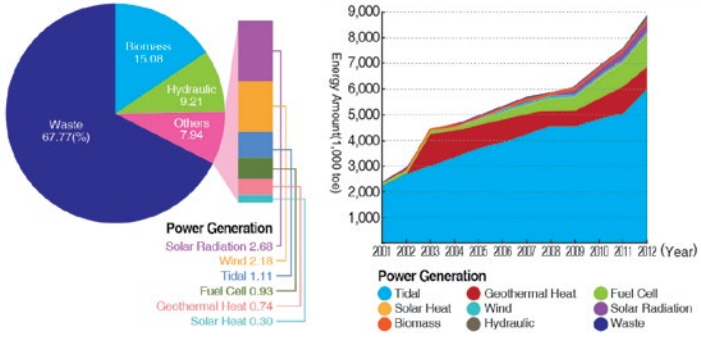

Figure 3-4 Renewable energy supply and changes in supply (2001-2012)

Though the percentage of energy supplied by new and renewable energy sources is minimal, it is undergoing a a steady rise. The economic efficiency of such energy resources as solar and wind power is still low compared with that of fossil fuels, but investment in these alternative energy resources is increasing due to their negligible environmental footprints and limitless supply. In terms of sources of renewable energy in Korea, the highest percentage (75 percent) is derived from waste reprocessing, followed by hydroelectricity (10 percent), and biomass (9.5 percent). Of the total energy supply, wind and solar energy together account for about 2 percent.

As a country, South Korea is resource-strapped and highly dependent on foreign energy resources. In view of the country's economic development and its higher standard of living, the consumption of such energy resources is increasing. Looking at power demand by type, industrial demand accounts for more than half, or 50.2 percent, of the nation's total energy demand. This is followed by household and business demand, which together account for 42.8

percent. Therefore, investments continue to be made in order to secure overseas resources, while diversity in type of resource imports is also being promoted so as to ensure a safe and steady supply.

Though Korea does possess some varied energy resources, its reserves are limited and of inferior quality, and so it is dependent upon imports for the majority of its energy resources. Korea's industrial development has meant increased production, and this coupled with the rise in the standard of living has resulted in a rapid increase in energy consumption. The country is self-reliant for only about 3 percent of its energy needs, and thus very highly dependent on overseas sources to meet demand.

With soaring prices due to the irregular supply of energy resources, and the tendency toward "resource nationalism" in countries with particularly valuable resources, efforts by Korean firms to pursue the development of overseas resources are meant to ensure a stable re-

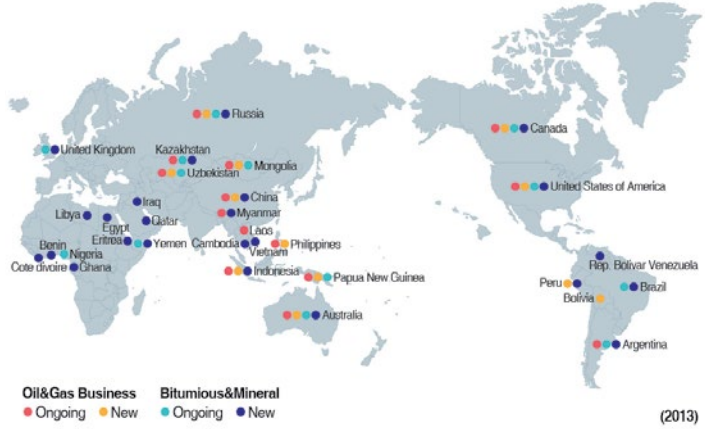

Figure 3-5 Overseas resource development by South Korea (2013)

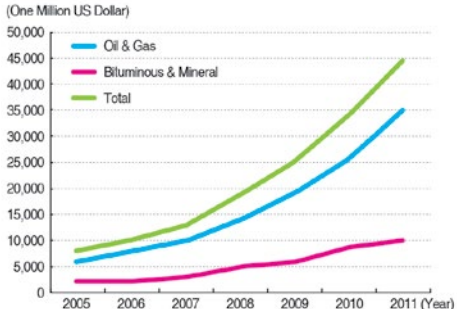

Figure 3-6 Investment in overseas resource development (2005–2011)

source supply. These efforts are focused not solely on energy resources; they are expanding to encompass mineral resources as well, as evidenced by recent efforts to secure development rights in a salt desert in South America for the exploitation of lithium, a key component in rechargeable cell phone batteries.

Agriculture, Fisheries, and Forestry: Shrinking Industries Witnessing a Rebound

In 1960, eight out of every ten Koreans lived in a rural environment. By 2010, not even one in ten Koreans did. A mere fifty years ago rural Korea was the center of the country's primary industries, among which farming was the most important. As a result of industrialization , which began in the 1960s under state-led industrial development policies, the prominence of the farming, fisheries, and forestry industries within the economy as a whole progressively declined. By 2011, these industries together accounted for only 2.4 percent of the national economy; of this small fraction, farming accounted for 80.6 percent, forestry 3.6 percent, and fisheries 15.7 percent.

As of 2012, South Korea's agricultural industry was made up of

1,151,000 households and engaged a population of 2,912,000 people; the forestry industry included ninety-eight thousand households and 248,000 people; whereas fisheries involved sixty-one thousand households and 153,000 people. Compared with households nationwide, the size of households involved in the agricultural, forestry, or fisheries industries has shown a more rapid downward trend. Two-person households, the most predominant kind, account for 25.2 percent of households nationwide, but make up 48.9 percent of agricultural households, 51.9 percent of fisheries households, and 52.9 percent of forestry households. Though the large proportion of two-person households in the agricultural, forestry, and fisheries industries reflects the overall aging of the South Korean population, compared with the nationwide percentage of elderly (11.8 percent), elderly make up 35.6 percent of the agricultural population, 27.8 percent of the fisheries population, and 34.1 percent of the forestry population. All agricultural, forestry, and fisheries households are seeing a decline, and the agricultural sector will continue to experience a decline in both full- and part-time farmers. As of 2010, approximately 625,000 farming households (54.3 percent) were engaged in farming full-time, while 525,000 (45.7 percent) were part-

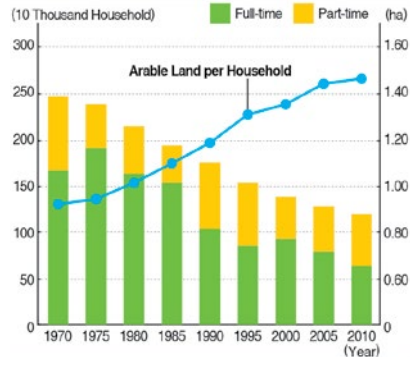

Figure 3-7 Amount of farmland per household (1970–2010)

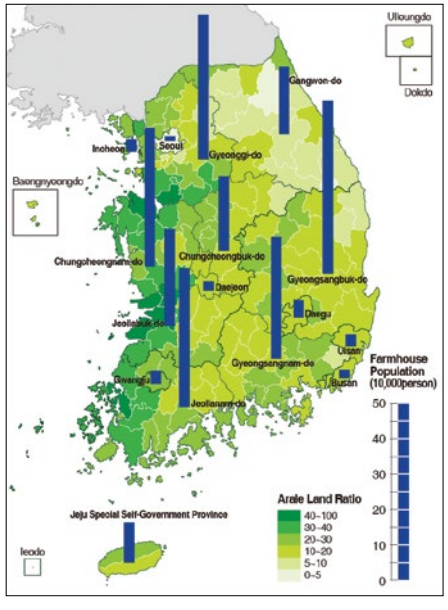

Figure 3-8 Arable land and farming households in South Korea

time. Though arable land has been reduced through urbanization and industrialization, a more rapid trend has been the increase in cultivated land being worked per household as a result of the overall decline in farming households. Looking at a map of cultivated farmland, one sees that the majority is found in the country's hinterland. In terms of the number of farming households by province, Gyeongsangbuk-do leads with 196,000 (17 percent), followed by Jeollanam-do with 164,000 (14.3 percent) and Chungcheongnam-do with 147,000 (12.8 percent).

In terms of amount of arable land, about 750,000 farming households (65.2 percent) cultivate 1 hectare or less, and ninety-nine households (8.6 percent) cultivate over 3 hectares, while large-scale farming (cultivating over 3 hectares) is on the rise. But due to the aging of the rural population and the concomitant decrease in the young and middle-aged populations, the rate of arable land utilization is also seeing a decline.

The two aspects of the forestry industry are the forested land itself and the forestry households connected to its cultivation. In terms of South Korea's forested land area, as with the country's arable land, though it has witnessed a gradual reduction in the face of the twin forces of industrialization and urbanization, this has also meant a great concentration and total amount of harvestable wood relative to area. Forestry households can be subdivided into those involved in forest cultivation and those that are not. The large majority are cultivating households—accounting for some eighty-six thousand, or 88 percent, of all forestry households. Among these, the highest percentage are those involved in the cultivation of astringent persimmons (29.7 percent), followed by wild edible greens—what Koreans call *sannamul* (18.3 percent), ornamental plants or horticulture (18.1 percent), medicinal plants (17.2 percent), and chestnuts (16.0 percent). As for noncultivating households, the highest percentage (9.4 percent) are involved in forest-gathering activities, followed by forestry industries (9.4 percent), and logging and nurseries (1.2 percent). Among forest-gathering households, the highest percentage (60.2 percent) are involved in the harvesting of mushrooms, followed by tree sap (14.6 percent), and bracken, or *gosari* (13.9 percent). Though as of 2012, the number of forestry households was insignificant, the industry has seen some slight growth due to a growing consumer demand for natural and health-promoting products.

Korea's fishery industry is a natural outgrowth of its geographic setting, surrounded as it is by sea on three sides. In terms of region, Jeollanam-do has the highest percentage of the country's fishery households at twenty-two thousand (35.1 percent), fol-

lowed by Gyeongsangnam-do with 9,800 (15.9 percent), and Chungcheongnam-do with 9,500 (15.5 percent). Of the country's total fishery households, about nineteen thousand (30.2 percent) are full-time, while some forty-three thousand (69.8 percent) are part-time. The number of fishing households is in decline, a result of the aging of the population, the depletion of fish populations, and the loss of coastal fishing grounds due to land reclamation. The number of fishery households involved in a type of fishing that utilizes fishing vessels is twenty-seven thousand (or 43.3 percent), while about eighteen thousand households (29.3 percent) do not use fishing vessels for their work, and seventeen thousand households (27.3 percent) are involved in fish farming. About 46.8 percent of the country's total fish production comes from shallow coastal farming, followed by 34.3 percent from deep-sea fishing, 18.1 percent from coastal sea fishing, and 0.9 percent from inland fishing. Until 2005, deep-sea fishing was the largest producer, but after that time it was overtaken by coastal farming. The origins of this change go back to the early 1990s with a shift in government policy toward fish farming and away from trawling. From 1998, with the entry into force of the Korea–Japan Fisheries Agreement, fishing rights were curtailed and there was a resulting drop in the number of fishery households, while government efforts at buying back offshore fisheries also resulted in an increase in the number of households abandoning sea fishing. Looking at the average household capital investment required by fishing type—under KRW 10 million (US$9,000) for fishing without a vessel, between KRW 10 million and KRW 100 million (US$9,000–90,000) for fishing with

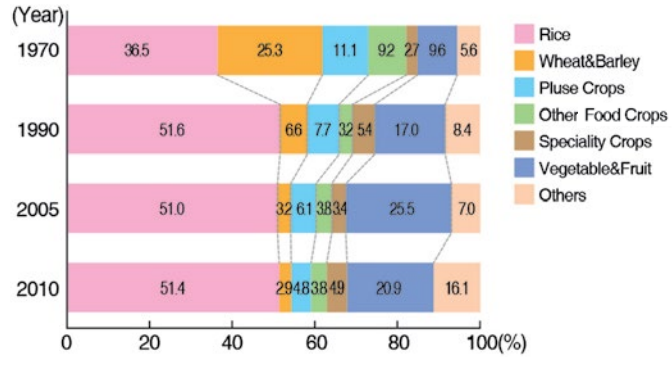

Figure 3-9 Changes in crop cultivation patterns (1970–2010)

a vessel, and over KRW 100 million (US$90,000) for fish farming or aquaculture—gives us an idea of relative production output for each of these types. The primary types of sea life harvested by Korean fisheries are, for aquaculture, shellfish (60.5 percent) and seaweed varieties (25.1 percent); for coastal fishing, various varieties of fish (31.7 percent) and crustaceans (31.3 percent); and in deep-sea fishing, such varieties as tuna, whiting, and pike. For inland fishing, eels and freshwater clams dominate. In terms of markets for Korean maritime products, the majority of such products (36.6 percent) are sold to the National Confederation of Fisheries Cooperatives, followed by direct sales to dealers in sea products (28.5 percent), direct sales to consumers (18.1 percent), and restaurants (5.8 percent).

Rural Korea has undergone fundamental change as a result of industrialization and urbanization, but in contrast to the drop in full-time farming households, the country is witnessing a rise in part-time farming households. Another distinguishing feature of

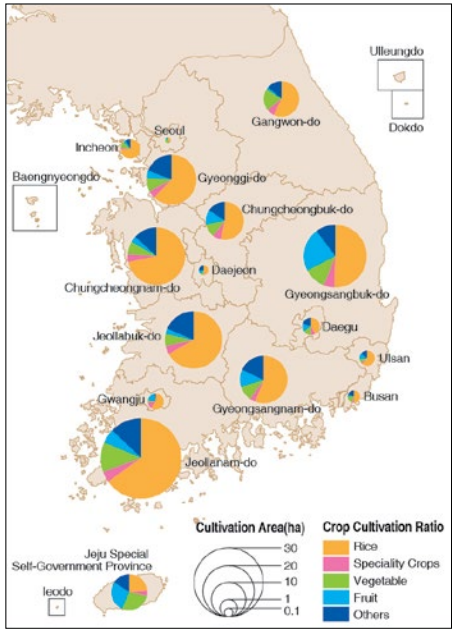

Figure 3-10 Hectares of cropland devoted to different crops

agriculture in today's Korea is the diversification and commercialization of agriculture, as seen in the increase of corporate agriculture and commissioned agricultural companies, which are expanding the scale of farming, and the rise in cash crops and corresponding decline in former staples.

Looking at the types of crops under cultivation, the staple rice is the most widely cultivated, particularly in the more temperate and flatter Jeollanam-do and Jeollabuk-do. However, in recent years the country's rice cultivation has seen a drop due to the opening of the country's market and a decrease in consumer demand. Due to lower consumer demand and profitability, the practice of double-cropping with barley in between rice crops has also declined. Barley cultivation is relatively high in Jeollanam-do, Jeollabuk-do, and Gyeongsangnam-do. As national living standards have risen, so has demand for fruits and vegetables, resulting in increased acreage dedicated to these cash crops. Compared with other areas of the country, the cultivation of fruit crops is widespread in Gyeongsangbuk-do and Jeju-do.

The World Trade Organization and free trade agreements have worked to accelerate the opening of Korea's agricultural markets and weakened the price competitiveness of Korean agricultural products. In response to this, there is a need to strengthen competitiveness though such measures as adopting more scientific agricultural management practices, focusing on high-end products, and cultivating eco-friendly, organic produce. Currently, the importance of agriculture in the national economy is waning, and to strengthen the competitiveness of the agricultural industry efforts are being made in such areas as increasing brand identity, improving product sophistication and quality, and producing agricultural products that promote health. Because sales are so critical, a strategy has been implemented to indicate products by geographical region of origin in order to both differ-

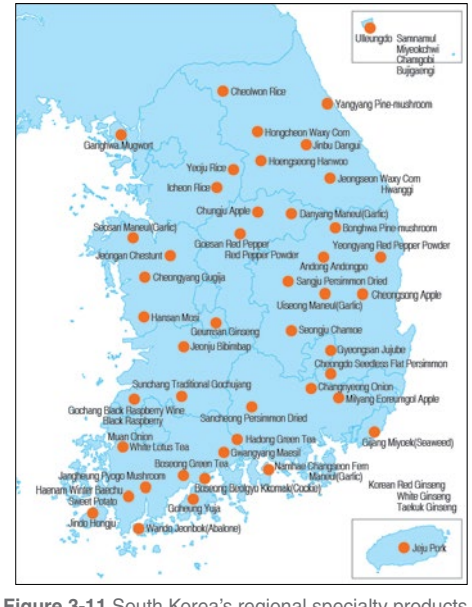

Figure 3-11 South Korea's regional specialty products

entiate them and raise their profile. This strategy promotes regional specialty products, such as rice, apples, or green tea, that reflect the special climatic, topographical, and soil characteristics of different regions. Such specialty products range from Boseong green tea (officially recognized as the number one regional specialty crop by the Korean government), to Seongju *chamoe* (Korean melons), and Danyang garlic. Further, these regions have launched festivals to highlight their local specialties and distinctive characteristics.

Environmentally friendly agriculture emerged to meet the varied needs of consumers arising out of improved standards of living and in an effort to differentiate domestic agricultural products from imported ones through the cultivation of high-quality crops through organic farming. With Korea's rapid economic growth over the past forty years, the country's rural areas have suffered a large population drain as residents migrated to urban areas. However, since the mid-2000s, in view of the economic recession and a growing population of retiring baby boomers, the country's rural regions and farming are witnessing a steady growth in population. Whereas the country had some 880 households return to rural residency and agriculture in 2001, this number grew gradually to 10,503 returning households by 2011, only to skyrocket in the course of a single year to record twenty-seven thousand in 2012. This resurgence of the rural population is made up of retired professionals and office workers realizing their dreams of taking up country life, while the mainstream is composed of younger people taking up farming for the first time. This phenomenon serves to both invigorate the rural economy and at the same time to infuse it with a new vitality as a result of a migrant younger population. Yet another ingredient in the mix is the presence of young foreign brides.

Industry: Electronics, IT, and Shipbuilding

Korea's premodern industry was centered on cottage industries that used indigenous raw materials – for instance, bamboo products from Damyang, *hwamunseok* products (woven from stems of a type of indigenous rush plant) from Ganghwado Island, and linen from Hansan. During the Japanese colonial period (1910–1945), the country's industry was developed as part of a colonial-service economy, centered on consumer industries in the Seoul–Incheon area and on mining industries in what is today North Korea. At the end of Japan's occupation of Korea in 1945, the country still faced a host of difficulties, including national division, a lack of raw materials, political turmoil, and social unrest. However, from the 1960s, South Korea embarked on rapid industrialization, moving from the promotion of import substitution industrialization to full-fledged export-oriented industrialization. Today, South Korea is a major exporter of semiconductors, electronics, and refined petroleum products and a leader in shipbuilding. The country can boast world-class competitiveness while its economy is a driving force in the world economy.

Major Industries and Industrial Areas

From the 1960s the South Korean government implemented a policy of full-scale promotion of the country's export industries.

Achieving this through government support, from the 1970s the government moved from substitution industrialization and began large-scale investments to promote export-oriented heavy industries. If this period was one of quantitative growth through concentrated capital investment, the 1980s saw increased in investment in human capital and research and development aimed at improving productivity rather than just increasing output. The fastest-growing industries during this period would prove to be the engines driving the long-term growth of the South Korean economy.

Korean industry got its start in construction with the founding of large-scale companies and the undertaking of massive building projects in the 1960s and early 1970s. After this came the growth of heavy industries like steel, automotive, and shipbuilding, while the electronics industry also saw rapid development. The growth of construction was in the context of the country's First Economic Development Plan (1962–1966), which sought to secure energy resources such as electricity and coal and to focus national efforts on the foundation of economic development through the expansion of key industries and infrastructure such as road and rail networks. Accordingly, large-scale civil engineering projects were implemented, such as the construction of refineries, cement plants, thermal power plants, and bridges over the Hangang River, the Seoul–Incheon double-track line, hydroelectric plants, and multipurpose dams.

With the Industrial Complex Development Act, part of the Second Economic Development Plan (1966–1971), locations such as Gumi, Changwon, Pohang, and Banwol became the sites of industrial complexes. Also during this period the Seoul–Incheon and Seoul–Busan expressways were constructed. Through such large-scale national development projects, the domestic construction industry gained notable technical skills. Such experiences and the technical proficiency they brought established a foundation for the nation's economic development. In the mid-1970s, the government threw its support behind the development of the six strategic industries of steel, chemicals, nonferrous metals, electronics, machinery, and shipbuilding.

In response to the rapid growth in demand for steel, the government in the 1960s attempted the construction of steel mills but found itself hampered due to an inability to secure the required funds. Eventually, through funds acquired as compensation from Japan for its period of colonial rule over Korea, as well as secured loans, by 1973 the Pohang Integrated Steelworks (today's POSCO) was completed, which made possible the smooth supply of the steel required for domestic industrial, construction, and public infrastructure development. Since that time, with the establishment of Dongguk Steel and Hyundai Steel, South Korea's steel production continues to grow. As of 2012 it had an annual output of nearly 35 million tons, making it the sixth-largest producer of steel in the world.

Though Korea possessed some shipbuilding capabilities in the 1960s, full-scale growth did not begin until the establishment of the shipyards of Hyundai Heavy Industries in 1973, followed soon thereafter by those of Samsung in 1977 and Daewoo in 1978. These shipyards were capable of building large-scale vessels. As of 2011, South Korea claimed the top market share in new shipbuilding or-

ders, accounting for 51.2 percent of the world's orders, compared with 31.2 percent for China and 4.7 percent for Japan. In recent years, the manufacture of various equipment used in the oil and gas extraction industry, such as LNG carriers, ice-breaking tankers, and oil rigs, are also claiming a higher market share.

South Korea's automobile industry had its real beginnings when in 1962 Saenara Automotive established a plant in Bupyeong, Gyeonggi-do. The Shinjin, Saehan, Hyundai, and Kia assembly plants soon followed, producing semifinished American and Japanese car models. However, automobile production didn't begin until 1973 when Kia Motors established an assembly line production plant in Gwangmyeong, Gyeonggi-do. This was followed in 1975 by Hyundai Motor Company building a comprehensive automobile plant in Ulsan equipped with modern equipment. With the production and export to the U.S. market of the Pony Excel (or Hyundai Excel), the country was on its way to becoming an automotive powerhouse. However, after the financial crisis hit in the latter part of the 1990s, Hyundai Motor Company acquired Kia Motors, Daewoo was sold to GM, and Samsung Automotive was sold to Renault. SsangYong was eventually purchased by the Shanghai Automotive Industry Corporation. In the wake of these changes, the South Korean automobile industry gradually regained a competitive place in the world market, rising to fifth in the world in terms of automobile sales.

The electronics and telecommunications industry may be called the heart of Korean manufacturing. From the 1970s Lucky Goldstar (now LG) and Samsung have been surrounded by intense competition in the electronics industry. With an eye toward the development of an export-driven economy, in 1971 the government spearheaded the development of the Gumi Electronics Industrial Complex, as well as other companies such as Anam Electronics and the Taihan Electric Wire Group.

In the semiconductor industry, due to its low labor costs South Korea from the late 1960s attracted such international companies as Motorola as a base for the assembly of its products. In 1966, the Korea Institute of Science and Technology was founded to further national efforts at technological research and development. Through efforts led by the private sector but with government support, the country's semiconductor industry gradually reduced the gap between its output and the products of developed nations. By 1993, South Korea led the world in D-RAM sales and in 1996, it successfully commercialized CDMA service for digital mobile communication. Though South Korea's electronics industries began to emerge only in 1994, the country soon led the world in the sales of such technologies as semiconductors, cell phones, and digital displays.

South Korea's industrial development began in the 1960s with labor-intensive light industries such as textiles, clothing, and shoes in major cities such as Seoul with large labor pools. During the 1970s and 1980s, capital and technologically intensive heavy industries such as the steel, petrochemical, shipbuilding, and oil refinery industries began to be developed while industrial areas in the country's southeastern coastal region were built to facilitate the import of raw materials and the export of the country's industrial output. From the 1990s, knowledge- and technology-intensive industries

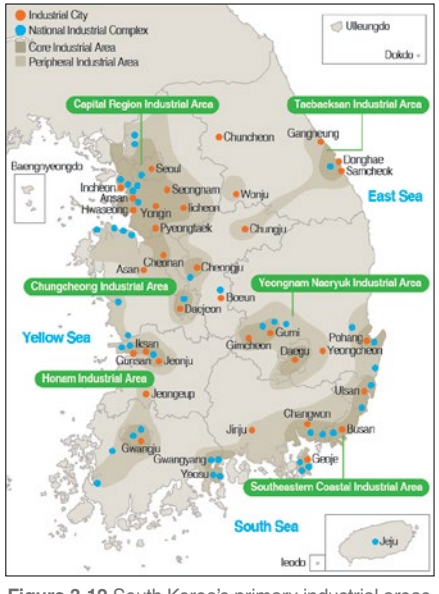

Figure 3-12 South Korea's primary industrial areas

like computers and semiconductors developed, concentrated in urban centers that provided the most advantageous conditions for their growth and development.

Looking at the salient characteristics of South Korea's industrial areas, urban zones with their convenient transportation nodes, wealth of capital and labor, and large consumer markets are the country's largest manufacturing centers with an established tradition of evenly developed light, heavy, and high-tech industries. The country's southeastern coast industrial zone is advantageously situated for the import of raw materials and export of industrial products. Government policy has led the growth of this area as locus of the country's heavy industries, such as steel (in Pohang and Gwangyang), petrochemicals (Yeosu and Ulsan), automobiles (Ulsan), shipbuilding (Geoje and Ulsan), and machinery (Changwon). The Yeongnam (a geographical term referring collectively to Gyeongsangnam-do and Gyeongsangbuk-do) inland industrial zone is labor-rich and conveniently situated for rail and road transport, making it a center of labor-intensive industries such as textiles and electronics. However, the area is experiencing a recession due to the rise in worker wages and continuing transfer of factories overseas. Rich in raw materials, the Taebaek industrial zone has developed industries such as cement that are based on raw materials. With its proximity to China, the Honam (referring collectively to Jeollanam-do and Jeollabuk-do) industrial zone has a high potential for growth as the country's second coastal industrial zone (after the southeastern coast zone) with a focus on trade with China. Benefiting from convenient transport links and proximity to large urban centers, the Chungcheong (Chungcheongnam-do and Chungcheongbuk-do) industrial zone is an area for the distribution of urban-based industries, with the development of heavy industries in the Seosan-Dangjin region and high-tech industries in the Daejeon-Cheongju area.

As of 2012, in addition to a being major producer of cell phones, South Korea is also a world leader in semiconductor sales (second worldwide), shipbuilding orders (second worldwide), and automobile production (fifth worldwide). In this, government policies have played a key role in South Korea's achieving, in the short period of about thirty years beginning in the 1960s, the technological independence necessary to attain industrial competitiveness and gain worldwide recognition as a technological powerhouse.

The Government's Development Policy

South Korea's national development is the outcome of government policy, with the Fourth National Comprehensive Territorial Plan

currently under implementation. The First National Comprehensive Territorial Plan, implemented in the 1970s, sought national industrialization and economic growth by adopting a "growth pole" approach, prioritizing for development those regions with high potential for growth and adopting strategies to maximize efficiency. To this end, industrial zones were created in the capital region and in the country's southeastern coastal region and infrastructure were expanded. Though this led to rapid growth, it also increased regional disparities and created significant environmental pollution.

The Second National Comprehensive Territorial Plan sought a compromise between growth pole development and balanced development. The goal was to eliminate regional inequalities and disperse the fruits of growth by expanding development potential nationwide. However, by most assessments the plan largely failed to resolve the problem of regional disparities.

The Third National Comprehensive Territorial Plan, the government's blueprint for the 1990s, focused on balanced development and also encompassed conservation of the national environment. The primary policy goal was to strengthen both national and re-

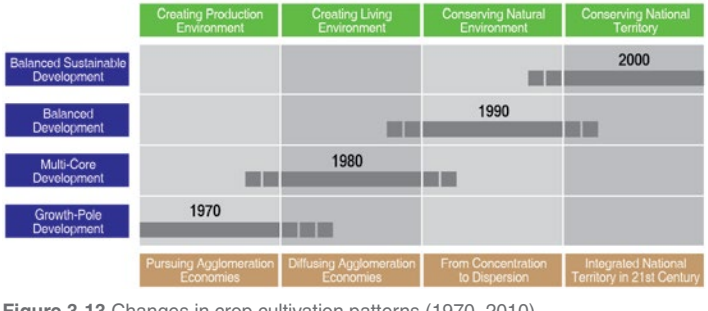

Figure 3-13 Changes in crop cultivation patterns (1970–2010)

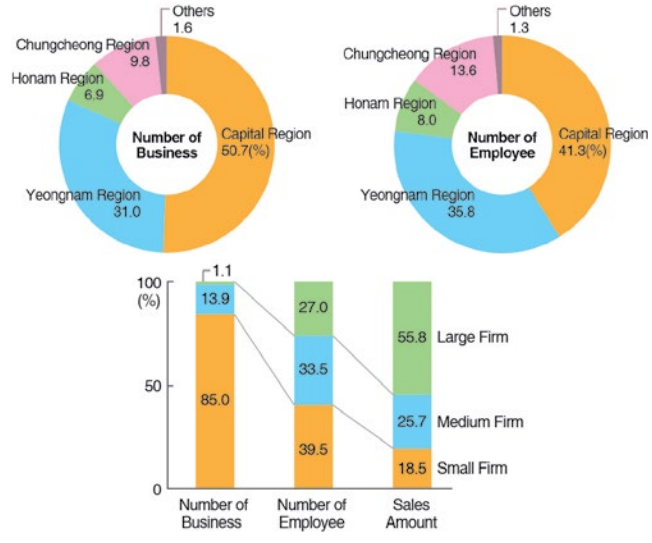

Figure 3-14 Economic importance of South Korea's different regions

gional competitiveness by encouraging regional development, reducing concentration in the capital region, promoting new industrial zones, and building integrated high-speed transport networks. Even at the conclusion of this plan's implementation period, however, there appeared to be considerable regional disparities.

The Fourth National Comprehensive Territorial Plan, the implementation of which commenced in 2000, omitted the vocabulary of development and aimed instead at strengthening national competitiveness and promoting Korea as a "global green nation"—a nation based on sustainable and eco-friendly policies and open to the world. The attempt here is the formation of a national spatial structure with a focus on the notion of 5 + 2 economic regions,

promoting hub city regions and through linkages and cooperation with the economic regions with the intention of inducing regional self-sustaining development.

The nature of South Korea's economy—its dearth of natural resources and concomitant high reliance on foreign imports, as well as its focus on the export of its industrial production—favored the development of industry in the coastal regions. But industry was far too heavily concentrated in the country's capital region and the Yeongnam (Gyeongsangbuk-do and Gyeongsangnam-do) region, resulting in disproportionate development. The government's policy of fostering the development of an export-driven economy resulted in its support being concentrated in conglomerates, such that there emerged a dual industrial structure with a large economic gap between the country's industrial conglomerates and small and midsized enterprises.

The excessive development of industry in the country's capital region and its southeastern coast industrial zone has brought a number of disadvantages to those areas: rising land costs, traffic congestion, and rising logistical costs, among others. In response, a factory location limit system has been implemented for the capital region. This system was initiated to curb the concentration of manufacturing in the capital region by regulating the expansion of new factories, while at the same time promoting state-of-the-art industries in the capital region with its excellent urban infrastructure, highly educated populace, and abundance of research facilities. To disperse industry and promote balanced regional development, regional industrial complexes have been created, industrial clusters

have been designated, and so-called "innovation cities" have been established.

Initiatives toward Balanced Regional Development

Efforts to maintain the country's competitiveness and to foster balanced regional development can be seen in initiatives to establish industrial zones and promote clusters, as well as in policies to create such things as innovation cities.

South Korea's industrial complexes date back to the 1960s as the driving forces behind the nation's rapid industrialization. Beginning with the creation of the Ulsan Industrial Complex, these complexes continued to be established. There are various advantages to establishing an industrial complex, including the granting of industrial land with infrastructure and government tax breaks and financial support, all of which serve to reduce initial investment costs. Further, the clustering of industrial enterprises allows for a synergy that promotes production, while on a national level the clustering of factories promotes more efficient land use while reducing social and environmental costs. However, a supplier-oriented use of industrial land resulted in a regional supply-and-demand imbalance. This, along with the aging of infrastructure, the environmental damage caused by environmentally reckless development, and the failure to respond appropriately to changes in both domestic and foreign industry have given rise to many problems.

Industrial complexes can be categorized into large national industrial complexes, regional industrial complexes, and agricultural industrial complexes. As for large national industrial complexes, these

emerged from the Minister of Land and Transportation's fostering of key industries as well as advanced scientific and technical industries. Regional industrial complexes are established through the designation of industrial areas by relevant city or provincial heads as a way of stimulating the local economy. Agricultural industrial complexes are set up in agricultural areas by the relevant town, county (*gun*), or district (*gu*) head with the aim of attracting and promoting industries to the area as a way of raising local incomes. Regional industrial complexes can be subdivided into general industrial complexes and high-tech urban industrial complexes. While general industrial complexes are largely manufacturing-oriented, high-tech urban industrial complexes, as the name implies, are geared toward the knowledge/culture/ICT industries through the establishment of such things as private venture complexes, cultural industry complexes, software development complexes, and industrial technology complexes.

As of 2012, South Korea had a total of some 960 industrial complexes, to include forty national industrial complexes, 488 regional industrial complexes, and 432 agricultural industrial complexes. In terms of area, they cover a total of about 111 million square meters, with over half of that (56 percent) taken up by national industrial complexes. Of the 64,788 enterprises distributed among these complexes, about 62.4 percent are found in national industrial complexes, 29.4 percent in regional industrial complexes, and 8.2 percent in agricultural industrial complexes. And in terms of workers, all together the complexes employ about 1.74 million individuals, with national industrial complexes employing the majority (56 percent), followed by regional industrial complexes (36 percent), and agricultural industrial complexes (7.9 percent).

Although in terms of dispersal across the country, regional industrial complexes are the most numerous, they only account for about 30 percent of the total number of enterprises and workers, while agricultural industrial complexes account for the smallest number of both enterprises and workers. Though numbering only forty—the smallest number among the three types of industrial complexes—large national industrial complexes are the most important, as they account for the highest number of enterprises and employees.

South Korea's first national industrial complex dates to 1962 with the establishment of the Ulsan-Mapo National Industrial Complex. This was followed by three complexes founded in the 1960s: the Korea Export Industrial Complex in both Seoul and Incheon and the Gumi Industrial Complex in Gyeongsangbuk-do. The 1970s saw the establishment of some fifteen complexes, including ones at Iksan, Okpo, Ulsan, Changwon, Yeosu, and Asan. Seven industrial complexes were set up in the 1980s in places such

Table 3-1 Overview of National Industrial Complexes (2012)

	Number of complexes	Total area (m^2)	Number of enterprises*	Number of employees
National industrial complexes	40	566,074	40,436	977,434
Regional industrial complexes	488	482,103	19,025	627,519
Agricultural industrial complexes	432	68,666	5,327	138,306
Total	960	1,116,843	64,788	1,743,259

*Operating enterprises

Source: Korean Industrial Complex Corporation, 2012

as Gwangyang, Jinhae, Incheon, Gunsan, Gunjang, and Daebul. The 1990s saw the establishment of eight more complexes, including one in Gwangju (Jeollanam-do), a petrochemical industrial complex in Chungcheongnam-do, and the Osong Industrial Complex in Chungcheongbuk-do. Finally, in more recent years, seven complexes were set up in the 2000s, including ones on Jejudo Island, in Daedeok, and in Daegu, bringing the total of national industrial complexes nationwide to forty as of 2012.

South Korea's industrial complexes play a major role in the country's total production and exports. Taken together, the country's industrial complexes' total output value amounted to KRW 987 trillion (US$925 billion) in 2011. Of this, national industrial complexes contributed 65 percent, regional industrial complexes contributed 30 percent, and agricultural industrial complexes contributed only about 5 percent. In terms of exports, the large role played by national industrial complexes is seen in the fact that in 2011 they

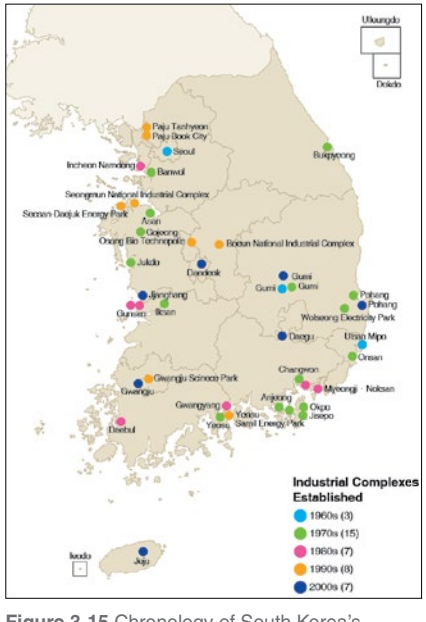

Figure 3-15 Chronology of South Korea's industrial complexes

contributed US$412 billion worth of exports, some 74 percent of the total value of national exports of US$555 billion. The output from such industrial complexes continues to rise steadily, with national industrial complexes in particular seeing increases in output and continuing to play a significant role in the nation's exports.

Examining overall production output and export output by industrial complex according to region, not only are conditions in such complexes ideal for production but together the six regions of Ulsan, Gyeonggi-do, Jeollanam-do, Gyeongsangbuk-do, Gyeongsangnam-do, and Chungcheongnam-do, whose industrial complexes have a high number of large petrochemical and electronics companies, account for some 79 percent of the nation's industrial output and about 85 percent of its total exports.

Since 2005, to strengthen competitiveness in the nation's con-

Table 3-2 Production and export volume of Korea's industrial complexes in 2011

Total		National Complexes	
Production (in trillions of KRW)	Exports (in hundreds of millions of US$)	Production (in trillions of KRW)	Exports (in hundreds of millions of US$)
987	4,120	643	2,758
−100	−100	−65.3	−66.9

Regional Complexes		Agricultural Complexes	
Production (in trillions of KRW)	Exports (in hundreds of millions of US$)	Production (in trillions of KRW)	Exports (in hundreds of millions of US$)
292	1,239	50	123
−29.6	−30.1	−5.1	−3

Source: Korean Industrial Complex Corporation

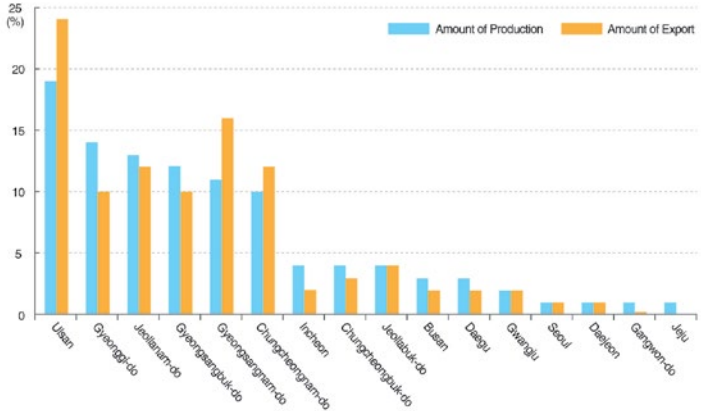

Figure 3-16 Production and exports for industrial complexes in different regions in 2011 (as percentage of total)

glomerated industrial areas, the focus has shifted from the existing concentration on labor and capital input and production to a regional strategic industry approach of fostering creativity and innovation through the formation of "industrial clusters." This strategy not only has one company in charge of production, but puts a university in charge of research and development, and service providers in charge of various research institutes and support functions. Thus, more than simply concentrating production in one geographic location, the fostering of such clusters aims to add value throughout the production process.

Recently established large-scale industrial clusters include Daegu Textiles, Ulsan Marine Shipbuilding, Gyeongnam (Gyeongsangnam-do) Knowledge-Based Machinery, and Ulsan Automotives. A variety of strategic industries have also been organized into small and midsized clusters. In pursuing a regional

economic development policy since 2008, the government seeks to gradually shift the economic unit to that of the economic region. Linking national and general industrial complexes with clusters

Table 3-3 Competitiveness of regional strategic industries

	Number	Regional Strategic Industries		
Large-scale clusters	4	Daegu: textiles	Gyeongsangnam-do: knowledge-based machinery	Ulsan: automotives
		Ulsan: marine shipbuilding		
Medium-scale clusters	10	Busan: port logistics	Busan: machine parts	Busan: tourism and conventions
		Daegu: mechatronics	Gyeongsangnam-do: industrial robotics	Daejeon: biotechnology
		Jeollanam-do: biotechnology	Ulsan: fine chemicals	Ulsan: environmental protection
		Gyeongsangbuk-do: electronic information systems		
Small-scale clusters	14	Gwangju: automotive and component machinery	Gwangju: design	Gyeongsangnam-do: intelligent homes
		Chungcheongbuk-do: next-generation batteries	Chungcheongnam-do: electronic information systems	Chungcheongnam-do: automotive components
		Chungcheongnam-do: Agro-livestock bio	Jeollabuk-do: traditional culture and film tourism	Jeollanam-do: new materials shipbuilding
		Jeollanam-do: culture and tourism	Gyeongsangbuk-do: New materials and components	Jeollanam-do: culture and tourism
		Gyeongsangbuk-do: new materials and components	Gangwon-do: culture and tourism	Jeju-do: culture and tourism
		Jeju-do: environmentally friendly agriculture		

Source: Gwon Yeongseop et al., 2007

Figure 3-17 South Korea's specialized regional clusters (Source: Korean Industrial Complex Corp. [KICOX])

composed of specialized enterprises from a given region is a way of fostering the development of strategic regional industries.

Specialized industries in these economic regions include the high-tech, telecommunications, and components/materials industries of the capital region; the automotive, mechatronics, and aerospace industries of the country's southeastern region; the electronics and machinery industries of the Daegu-Gyeongsangbuk-do region; the IT, electronics, and related industries of the Chungcheong region; the shipbuilding, automotive/automotive parts, and optical electronics industries of the Honam region (comprising Jeollanam-do and Jeollabuk-do); and finally, though relatively sluggish in their development, Gangwon-do and Jejudo Island have emerging medical device and food biotech industries.

Another initiative toward balanced regional development involves

a focus on fostering development in relatively backward regional areas as a response to the overdevelopment of the country's capital region through the establishment of so-called "innovation cities." Innovation cities are envisioned as pioneering futuristic cities, ideally livable locales combining high-level residential, educational, and cultural facilities. Here, transferred government facilities will work in close collaboration with health, educational, research, and institutional organizations in an optimally innovative environment. One key aspect of the plan is the transfer of government offices, and with them their affiliated enterprises, schools, and research centers, from the Seoul capital region to these innovation cities in growth-pole regions.

The government's initiatives toward balanced regional development also involve the aforementioned fostering of innovation clusters, geared toward regional economies, from the country's network of industrial complexes. Thus, along with the transfer of government offices to the provinces in order to promote regional industry, education, and research, one sees that the government is pursuing a variety of strategies simultaneously both to promote regional development and strengthen national competitiveness.

Transportation and Telecommunications: Balanced Regional Development and Spatial Division of Labor

A country's transportation and communications networks may be likened to a nervous system; they ensure that all aspects of our society move along smoothly. But with advances in transportation

and communications have come changes in our conceptualization of size and distance, as the faraway becomes near and a vast region comes to seem smaller. These changes in turn carry with them economic, social, and cultural ramifications.

Advances in Transportation

Korea was in the past lax in its road building. Frequent foreign invasions had convinced Koreans that building roads over the peninsula's rough terrain would only facilitate further incursions. The major roads constructed in the early years of the Joseon Dynasty (1392–1910) were built largely for administrative and military reasons, rather than to advance commerce or trade. During the period of Japanese occupation (1910–1945), a national rail transport network began to emerge with the laying out of a primary X-shaped railway network, and with this came also the beginnings of interregional exchanges. In the 1960s, with the growth of the national economy, conditions came to favor developments in short-distance transport, with a focus on passenger and freight transportation. The late 1960s saw the construction of the Gyeongin (Seoul–Incheon) and Gyeongbu (Seoul–Busan) Expressways. At 428 kilometers in length, the Gyeongbu Expressway, which was begun in February 1968 and completed in July 1970, is the country's longest expressway, traversing the length of the country and connecting the nation's two biggest urban centers.

The completion of the Gyeongbu Expressway made South Korea a "one-day country" (the national territory could now be traversed in a single day) and put in place the land transport system required

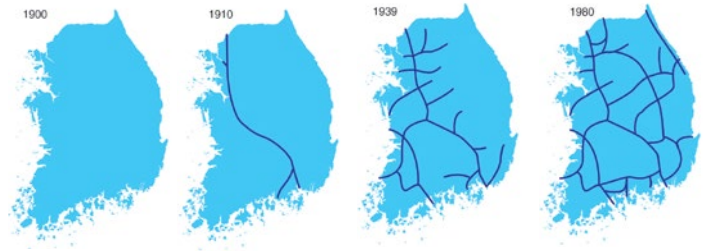

Figure 3-18 The development of the national road network (Source: Kim Hyeongguk 1997)

for industrialization. The 1970s saw the completion of the Honam (Daejeon to Suncheon), Namhae (Yeongam to Busan), Yeongdong (Incheon to Gangneung), and Donghae (Busan to Sokcho) Expressways, as well as construction of the first lines of the Seoul subway system—built to alleviate growing traffic congestion problems in the capital. This was followed by the construction of subway systems in Busan, Daejeon, and Daegu, again to help with the increasing traffic congestion in those cities.

In the 1980s, with the completion of the 88 Olympic Expressway (Damyang to Daegu), Jungbu (Central) Expressway (Daejeon to Hanam), Jungbu Naeryuk (Central Inland) Expressway (Changwon to Namyangju), and Seohaean (West Coast) Expressway (Muan to Seoul), the expressway network became the country's transportation backbone. The 1980s was an era of rapidly increasing car ownership in Korea and with greater transport demands, the decade was also characterized by the construction of alternative routes and the expansion of existing ones. The latter part of the 1990s was also a period of highway network expansion, including the expansion of the Seohaean Expressway (now connecting Incheon and Mokpo) and the completion of the Jungang

Figure 3-19 South Korea's major transport networks

Expressway (Daegu to Chuncheon), as well as the Busan–Daegu and Daejeon–Jinju highways, such that even once-neglected regions were now linked up as part of the transportation network. South Korea now has thirty-one national expressways covering a total of some 4,000 kilometers. In the 2000s, work was begun on the high-speed KTX rail network, and in 2004 the portion of the Seoul–Busan high-speed line from Seoul to East Daegu began service with the trains reaching speeds of 305 kilometers per hour. In 2010, the entire Seoul–Busan high-speed rail line was completed, while the Honam high-speed rail line was slated for completion in 2014.

South Korea's airline industry has its origins immediately after liberation with the formation of the Korea International Airline Company in 1946, which became the Korea National Airline Company (KNA) in 1948. But losses sustained from insufficient passenger demand and other factors led in 1962 to the KNA's acquisition by the government, which then ran it as the Korean Airlines Corporation (Daehan Hanggongsa). However, with the continuing lack of passenger demand the government was unable to run the company at a profit and ended by selling it in 1969 to the Hanjin Company and so Korean Airlines (Daehan Hanggong) was born. After this initial period of development, in 1988 Asiana Airlines was born: South Korea's second civilian airline and a competitive carrier for the country's domestic routes. In 2003, with the launch of Hansung Airlines, low-cost domestic carriers began to make an appearance. They now include Jeju Air, Jin Air, Air Busan, Eastar Jet, and T'Way Airlines (formerly known as Hansung Airlines). For 2012, air passengers in South Korea (both departures and arrivals)

Table 3-4 Transportation use

	Passengers (number of people using each mode of transport)					
		Road	Subway	Rail	Air	Ship
1990	144,877 (100%)	127,219 (87.8%)	11,016 (7.6%)	6,448 (4.5%)	111 (0.1%)	83 (0.1%)
2000	135,153 (100%)	104,106 (77%)	22,352 (16.5%)	8,373 (6.2%)	225 (0.2%)	97 (0.1%)
2010	130,149 (100%)	96,464 (74.1%)	22,731 (17.5%)	10,609 (8.2%)	202 (0.2%)	143 (0.1%)

	Freight (tons shipped via each mode)				
		Road	Ship	Rail	Air
1990	3,371 (100%)	2,151 (63.8%)	639 (19%)	579 (17.2%)	2 (0.1%)
2000	6,763 (100%)	4,962 (73.4%)	1,345 (19.9%)	452 (6.7%)	4 (0.1%)
2010	7,780 (100%)	6,200 (79.7%)	1,190 (15.3%)	392 (5%)	3 (0%)

Source: Korean Statistical Yearbook

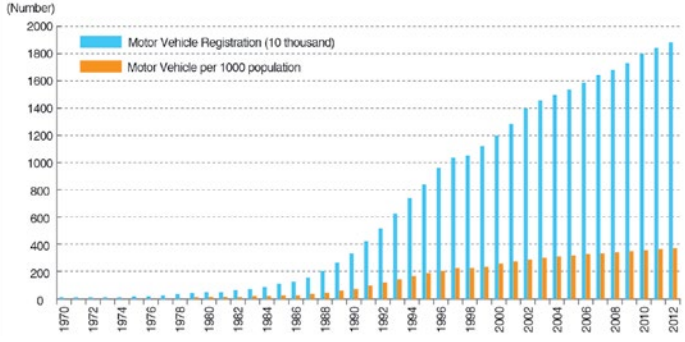

Figure 3-20 Rates of automobile ownership in South Korea (1970–2012)

totaled about ninety-two million. Of this number, about thirty-nine million, or 40 percent, passed through Incheon International Airport and nineteen million through Gimpo Airport in Seoul. Another eighteen million used Jeju Airport and nine million used Gimhae Airport. The country's economic development has meant a rise in personal incomes, and consequently an increase in high-speed transport and domestic aviation customers. Meanwhile, public transport is also changing with the expansion of domestic routes and improvements in service.

Let us now look at the state of transport in South Korea by automobile ownership rates and transport use by mode. In terms of car ownership, the mid-1980s saw a sharp rise in the country's car ownership rate, reaching one million owners by 1985, ten million by 1997, and nineteen million by 2012. Car owners per thousand people also saw a continual increase, with about fifty per thousand people in 1988, one hundred by 1992, and more than two hundred only four years later in 1996. Finally, as of 2012, South Korea recorded about 370 per thousand people—about a twenty-three-fold increase in the space of thirty years (Figure 3-20).

Looking at transport usage broken down by mode, in terms of passenger use for the year 2010, road transport saw the highest use, accounting for 74 percent of passenger transport. This was followed by subway, rail, air, and ship. In terms of freight transport, road use accounted for the highest proportion at some 80 percent, followed by ship and then rail, while air transport only accounted for a fraction of the freight moved. Comparing these figures with past averages, we find that rail and subway have seen a slight rise in use ratio, while roads have seen a relative drop. For freight, the opposite is the case, with more recent statistics showing a slight rise in the ratio of road use and a drop in rail use.

Telecommunications and Mass Communications

One result of South Korea's rapid economic growth during the 1960s and 1970s was the chronic shortage of telephone lines, and by 1980 the country still only had about 2.8 million phone lines. However, as a result of investment, beginning in 1981 about a million phone lines began to be added annually. In 1984, South Korea completed the world's earliest digital long-distance switching network and by 1987 had completed installation of a fully automated telephone network nationwide with ten million lines, ushering in the country's "phone in every household" era. In the early 1980s—before the concept of data communications was even widely known—the Korea Data Communications Co. Ltd. (later LG Dacom) was established. In 1984, the Korea Data Communications Service

Corporation was launched; it worked to expand the wireless calling network and introduced the first mobile phones. By 1995, sales of domestically produced phones surpassed those of Motorola and took the lead for the first time. In 1994, SK Telecom was privatized and in 1997, Korea Telecom, Hansol (both now merged as KT), and LG Telecom all introduced commercial services for personal mobile phones; now the era of mobile telecommunications had truly begun. With its advanced cell phone technology, as of 2012 South Korea leads the world in the manufacture and shipment of mobile phones.

Looking at South Korea's telecommunications use in terms of wired (landlines), wireless communications, and high-speed internet, the number of landline users steadily increased up to the mid-1990s, when increasing mobile phone use resulted in a concomitant decline in landline subscribers. As of 2010, statistics revealed that mobile phone use had spread such that there were a hundred mobile phone subscribers per hundred people, or one mobile phone subscription per person, and since that time the number has increased. Subscribers to high-speed internet service have also shown a steady increase and as of 2012 there were about thirty-eight subscribers per hundred people, which translates into about one high-speed internet subscription per household. The rapid strides made by South Korea's telecommunications industry since the mid-1990s were such that in a 2002 National Informatization Index survey of fifty nations, South Korea made the "Global Top Ten," ranking number one in the world in terms of broadband penetration and number four in number of broadband users (with sixty-one users per hundred people).

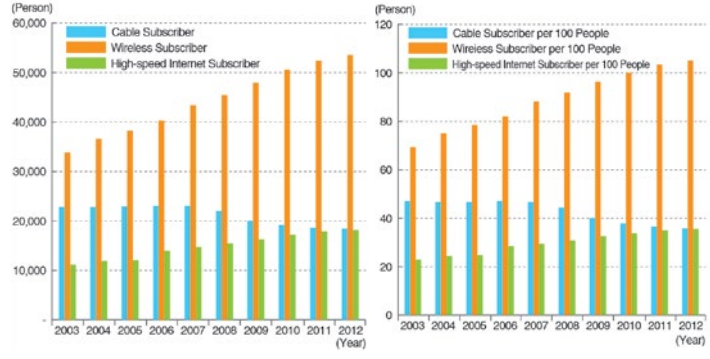

Figure 3-21 Subscription rates for different telecommunications services (2003–2012)
Source: Korea Statistical Yearbook

Looking at nationwide internet penetration by region, the capital region has the highest rate at over 80 percent, followed by the other large urban areas of Busan, Ulsan, Daegu, Gwangju, and Daejeon. High-speed broadband internet access is also widely available in these metropolitan areas.

Further, the country's high-speed broadband network forms an urban web, linking regional urban centers directly to the large metropolitan hubs. Mobile and internet communications are driving the growth of South Korea's IT industry, which in turn is leading the country's economic development, while the "digitization" and "informatization" of people's daily lives are emerging as a core aspect of the nation's social infrastructure. Importantly, integrated broadcast communication services, a combination of wired and wireless communications with internet technology, have made it possible to speed up various types of information communications. The essence of modern technological development is its eradication

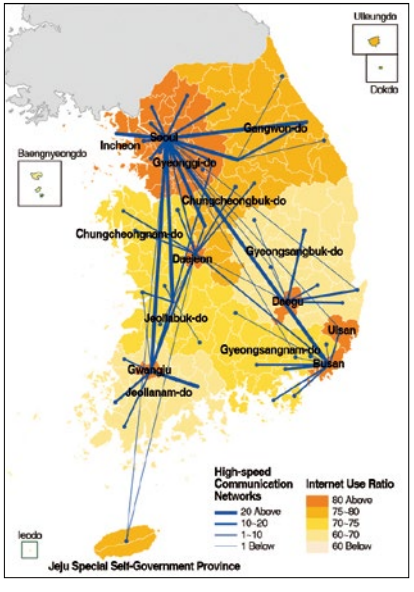

Figure 3-22 Broadband internet networks and internet penetration rates (Source: Internet Statistic Information Retrieval Service)

of spatial limitations, and with the growing use of smartphones and tablet PCs, the use of telecommunications for such things as shopping, education, healthcare, e-commerce, and "smart work" (telecommuting) is a dynamic trend.

The development of the internet has made possible the dissemination, in both audible and visual formats, of mass quantities of interactive and complex information with a profound impact on mass communications.

Traditionally, mass communications refers to newspapers and broadcasts, with newspapers providing reporting, commentary, editorials, and other information on a wide field of political, economic, social, and cultural topics, as well as specialized topics, and which are typically disseminated at least twice a month under a single masthead. They can vary by publication type—general consumer publications, economics-focused, specialized coverage, etc.—as well as by area of dissemination. Some are disseminated nationwide, whereas others are limited to a given area such as a city or town. Newspapers can also be categorized by publication frequency—dailies, weeklies, and internet newspapers. As of 2011, South Korea had fifteen national dailies (the most important type of newspapers) and 103 regional newspapers. In terms of circulation rates for the country's largest dailies, the *Chosun Ilbo* leads with 1,799,166, followed by the *JoongAng Ilbo* (1,300,354), *Dong-A Ilbo* (1,198,069), *Maeil Business Newspaper* (900,135), and *Korea Economic Daily* (504,230). For regional newspaper circulation rates, Busan's *Busan Ilbo* leads with 177,481, followed by the *Maeil Shinmun*, covering Daegu and Gyeongsangbuk-do (150,450), the *Kookje Shinmun* in Busan (97,284), the *Kangwon Ilbo* covering Gangwon-do (75,420), and the *Yeongnam Ilbo* covering Gyeongsangbuk-do and Gyeongsangnam-do (71,157).

Readership rates for print newspapers have been on the decline since about 1996. This decline can be attributed to the advent of new media and the increasing preference of readers to obtain their news from a paper's website or other online news service rather than from traditional print newspapers. One problem with this is that news portal sites tend to be overwhelmingly dominated by entertainment and sports articles. Broadcast media, public radio and television have also been affected by the increasing presence of cable broadcasting and the internet.

Korean broadcasting history goes back nearly ninety years. The country's first radio broadcast dates to February 1927 during the Japanese occupation period and began as a means of promoting Japanese colonial policies. In the wake of Korea's liberation in 1945, KBS (Korean Broadcasting System) radio started up as a state broad-

casting organ and then in 1954 the nation's first private radio station was established, the Christian Central Broadcasting (Gidokgyo Jungang Bangsong, today the Christian Broadcasting System), initiating the coexistence of state and private radio stations. Korea's first telecast dates to 1956 with the establishment of the Korea RCA Distributor (KORCAD). KBS TV, the country's first full-scale station, was established in 1961, followed soon thereafter by Tongyang Television (1964) and MBC-TV (1969), ushering in the "three-television-station era." In 1980, the so-called "New Military Group" (a group of military officers headed by Chun Doo-hwan, who had organized the 1979 coup against civilian rule), in a strategy of consolidating the nation's media companies, merged Dong-A Broadcasting and Tongyang Broadcasting into KBS, and then through new press guidelines set about controlling media reports, ushering in the dark ages of South Korean media. In December 1980, color television broadcasts made their first appearance. However, after the "June 29 Declaration" by then–presidential candidate (later president) Roh Tae-woo, pledging significant democratic reforms, media freedoms were granted and new broadcasting companies were established. Beginning in 1990, private broadcasting companies started to sprout up in earnest—Seoul Broadcasting System (SBS), Pyeonghwa Broadcasting Corporation (PBC), Buddhist Broadcasting System (BBS), and Seoul Traffic Broadcasting System (TBS)—and Educational Broadcasting System (EBS) broke off from its parent, KBS, to become an independent operator. Early 1995 saw the launching of cable television as well as private regional television stations. In 2005, the world's first satellite digital

media broadcasting (DMB) service, and then terrestrial DMB, were launched, while in the following year regional providers for nonmetropolitan areas and regional terrestrial DMB providers were decided upon and DMB broadcasting began there. Further, also in 2006, pilot service began for IPTV (Internet Protocol Television). Demand is growing for IPTV and DMB, which merge traditional broadcasting and telecommunications into new media content, and they are growing as the new central production base and cultural infrastructure. Internet broadcasting is supplanting traditional broadcasting and telecommunications as the new alternative media domain. Because of the distinctive characteristics of the internet, it is able to extend into the traditional media domains, while the internet can also extend the reach of broadcasting. In contrast to traditional forms of broadcasting, the internet is bidirectional and interactive while combining the functionality of print media, radio, and television. In 2011, four comprehensive programming channels (*Chosun Ilbo*'s TV Chosun, *Joongang Ilbo*'s JTBC, *Dong-A Ilbo*'s Channel A, and Maekyung Media Group's MBN) were launched via cable television, satellite broadcasting, and IPTV. The multimedia, multichannel era had begun in earnest.

Issues and Policies in Transportation and Telecommunications

It was anticipated that the development of the nation's transportation and communications would lead to the alleviation of regional disparities by reducing transportation and communication costs and facilitating the relocation of population and enterprises to the provinces. However, in reality such advances only contributed to

spatial specialization and served to accelerate concentration in qualitatively advantaged areas; as a result, the population and its economic activity became concentrated along the key traffic arteries. The nation's high-speed railway, the KTX, was established with the aim of promoting balanced regional development and more efficient land use. However, the availability of high-speed rail services might allow other regions greater access to the superior services available in the capital region, thereby weakening local service industries. This is sometimes called the "drinking straw effect" because the KTX is analogous to an extra-long drinking straw, enabling Seoul to suck up resources from faraway parts of the country.

Though the expansion of information and communications technology is hailed for its potential to increase the efficiency of the service industry and create added value in a knowledge-based economy, it is also true that there are large gaps in the use of such technology across income and education levels, as well as a problem of serious inequalities between urban and rural regions that will need to be addressed. What's more, the rise of virtual vendors as a result of the increase in e-commerce initiatives is driving demand for things like courier and logistics firms. The toll on small-scale stores and traditional markets is rather striking. The internet has also had a profound effect on the media, with the explosion of news portals leading to a crisis in traditional print news. Further, the forces of market competition among news portals have made information a commodity and commercialized news, leading to a situation where news caters to public opinion. Accordingly, there has been an increase in the proportion of entertainment-based stories. Many observers have

identified this trend as detrimental to the public interest.

Information and communications technology has also played a valuable role in transportation, but more importantly, its technological infrastructure has played a critical part in increasing overall industrial efficiency. The country's transport network is continually being expanded and upgraded. In terms of roadways, in order to improve the mobility and accessibility of the primary road networks, grid-pattern networks have been expanded and modifications undertaken on high-congestion zones; in terms of the rail network, the country's X-shaped high-speed rail network was constructed to link up with the square-shaped network covering the east-west coastal area to create a consolidated national rail network. For the nation's ports, efforts have been made to make Busan Port a hub port for Northeast Asia, with Incheon Port as a regional base port. For air transport, rather than dispersing investments across regional airports, efforts were concentrated on expanding the international competitiveness of Incheon International Airport as a central hub for air traffic. Overall, efforts have been made to reduce social and economic costs while promoting sustainable, green growth through the creation of an integrated land, sea, and air transport network. With the internet now ubiquitous, expanded investment in the anticipated network for such a data explosion is direly needed. As such, in order to put in place a gigabyte network across the country, the Giga-KOREA project was implemented. The expansion of smartphone usage has led to the expansion of Korea's telecommunications infrastructure, but its software lacks competitiveness compared with its IT hardware. This, combined with the fact that

it lacks key core technologies and creative talent, has policy makers concerned. As a result, they are seeking to strengthen national competitiveness by applying the smart technology revolution more effectively and by making better use of South Korea's existing IT infrastructure. Further, in order to enhance the growth drivers of the country's information-communications-broadcasting ecosystem, in 2013 the government established the Ministry of Science, ICT, and Future Planning with responsibility over information and communications technology and services, as well as the Presidential Broadcast Communications Commission to pursue broadcasting in the public interest, promote diversity in multichannel programming, and spearhead efforts at augmenting national competitiveness.

The Service and Tourism Industries: Emphasis on Producer Services, Festivals

Not only does the service industry have a profound impact on people's daily lives, but by stimulating economic activity the industry also has enormous potential to drive growth in other sectors such as manufacturing. Leisure activities can serve as a respite from work and other social obligations and can take diverse forms—self-development, enjoying the beauty of nature, or taking in cultural events. With the rise of household incomes and the development of the country's transportation infrastructure, there has been a concomitant growth in such leisure activity. Further, through the promotion of tourism and a focus on natural scenery, many rural areas are stimulating their local economies by attracting visitors from urban areas.

South Korea's Service Industries and Service-Industry Policies

Prior to the 1960s, the vast majority of Korean industries were in the primary sector (i.e., agriculture, forestry, fishing, mining), while the country's secondary industries (i.e., manufacturing) were insignificant, and tertiary industries (i.e., service industries) were limited to the supply of basic goods and services in a society centered on agriculture. Beginning in the 1960s, as the country underwent rapid industrialization, secondary industries grew significantly in proportion to the national economy and primary-sector industries saw a sharp decline. The tertiary industries, or service industries, are in a constant process of advancement and specialization, and their target customers are changing. Service industries have moved beyond the individual consumer and are now targeting the manufacturer.

With regard to the relative importance of the service sector in the nation's workforce, the service sector accounted for 58.6 percent of South Korea's total workforce in 1995 and 64.6 percent by 2010. In terms of the various service industries, the largest are the wholesale and retail industry and the accommodation and food industry, though these are experiencing a gradual decline while the business service and education industries are seeing growth. Service industries are by their nature found in areas with a high demand for services. These industries can focus either on high-value-added services such as banking, insurance, and real estate—producer services that support business activities—or on low-valued-added services that target individual consumers. Examples of such consumer-oriented services include food, lodging, and retail and wholesale businesses. In terms of their physical location, producer services collocate with

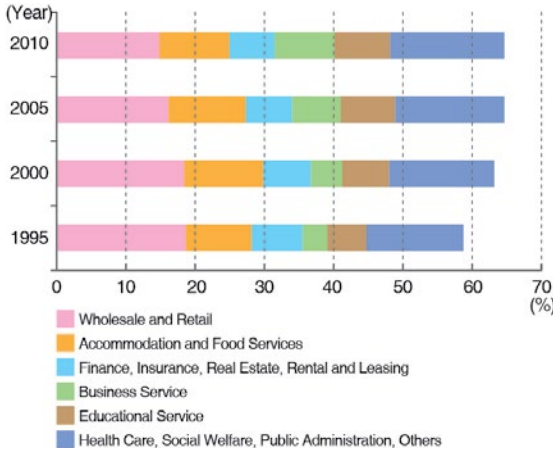

Figure 3-23 Service industry employment figures in South Korea ,1995–2010 (sectoral breakdown)

business enterprises and a commanding percentage are located in major metropolitan areas with large working populations and information sources. In order to minimize travel time and increase proximity to their target customers, consumer services tend to be widely dispersed. In the case of Korea, looking at the service industry as a whole, a large percentage of producer services are to be found in the Seoul Capital Region and Busan Metropolitan City, and a high percentage of producer services are found in Seoul, Daejeon, Busan, and other metropolitan cities.

Looking in greater detail at the distribution of service-sector workers in Seoul, high concentrations of workers in producer services are found in the districts (*gu*) of Jung-gu and Gangnam-gu, as well as on the island of Yeouido (a banking and financial center located in Seoul's Hangang River) and in the Guro Digital Complex. Consumer services workers constitute a large floating population,

but their distribution is closely tied to residential areas in parts of the city with high purchasing power.

Consumer service businesses—for example, wholesale and retail commerce and food and hospitality—are disproportionately strong relative to Korea's service sector overall, while its producer services sector is somewhat vulnerable. Due to the expertise that a service industry in a knowledge-based economy requires, Korean firms will need to grow to the level of foreign companies, whose superior brand recognition and technological strengths have allowed them to occupy the dominant positions in such producer service industries as banking and insurance, consulting, and market research. With economic restructuring, it is important that key high-value-added industries, notably those in the producer services sector, become complementary to enterprises in the industrial manufacturing sector and that the cultural and tourism industries also create added value and jobs in their sectors. In order to strengthen

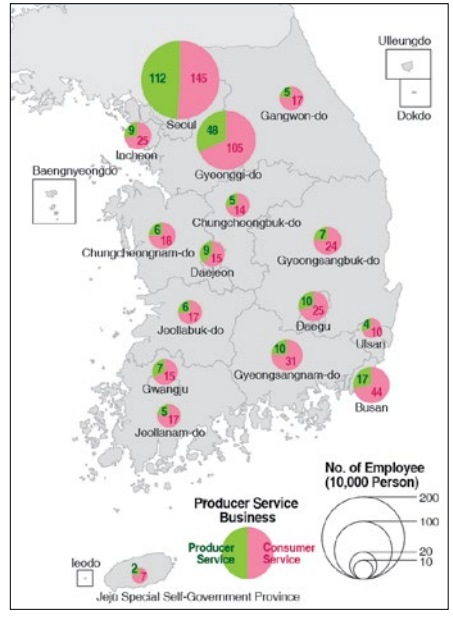

Figure 3-24 Economic importance of service industries in different regions

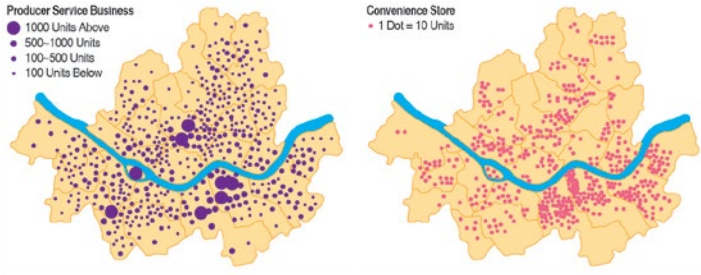

Figure 3-25 Distribution of service industries in Seoul

the nation's creative and imaginative clout through such things as its information and knowledge base, cultural content, and software, the South Korean government has recently begun to emphasize knowledge-based services and the creative industry. This emphasis on knowledge and creativity as the nation's future growth engines comes amid the proliferation of information technologies, such that knowledge, information, and content are now diffused on a global scale. This in turn is increasing the public appetite for recreational activities and interest in cultural value, such as adventure travel and the arts, such that the commercialization of the environment has became the background to new creative endeavors.

Tourism and Recreational Activities, Space, Industries, and Regional Festivals

The public desire for leisure, tourism, and recreation is a relatively recent phenomenon. In the more traditional past, the daily struggle to survive engendered an expression: "Even the pleasure of Mt. Geumgangsan must wait until after the meal." (In the Korean mind, the scenic wonders of Mt. Geumgangsan on the eastern coast were traditionally something one hoped to see one day). Korea's international tourism industry has its origins in the years following the Korean War (1950–1953) in efforts to accommodate the many U.S. soldiers who were stationed in South Korea as well as those on furlough from Japan. In 1960, South Korea became a designated destination for soldiers on R & R (rest and recuperation) from their home units, and in Seoul the exclusive Walkerhill Hotel was constructed for the exclusive use of foreigners. Following this, with the normalization of South Korea–Japan relations in 1965, the sudden influx of Japanese visitors brought revolutionary change to the country's tourism industry. Until 1970, the nation's tourism industry, geared toward foreign visitors, was one of the government's major strategic industries and as such it supported the construction of many tourist hotels.

The South Korean domestic tourism industry really has its origins in the 1970s with the growth of household incomes and the construction of the Gyeongbu, Yeongdong, and Honam Expressways. With the expansion of the national road network and the increasing proliferation of private vehicles, different regions began to make efforts to develop and promote their native scenic areas and cultural assets in order to draw tourists. Particularly from 1995, with the restoration of autonomous local administration, regional governments became increasingly active in developing local tourism initiatives, supporting the establishment of a tourism infrastructure through the building of things like restaurants, souvenir shops, and lodging facilities in tourist areas, often at the cost of damage to the natural environment.

Korea has a wide variety of tourist attractions, including national parks, UNESCO World Heritage sites, and regional festivals. A national park is a representative natural scenic area that a national government designates by law for protection and management. South Korea's twenty-one national parks attract large numbers. Its first, Jirisan National Park, was designated in 1967; its most recent, Mudeungsan National Park, was designated in 2012.

World Heritage status is conferred by the United Nations Educational, Scientific and Cultural Organization on outstanding cultural or natural heritage sites worth of protection and preservation as part of the common heritage of humanity. In Korea, cultural UNESCO World Heritage sites include the storage halls (called the Gyeongpanjeon) for the *Tripitaka Koreana* at Haeinsa Temple, Jongmyo Shrine in Seoul, and Seokguram Grotto and Bulguksa Temple (designated in 1995); Changdeokgung Palace and Suwon's Hwaseong Fortress (designated in 1997); the dolmens of Gochang, Hwasun, and Ganghwado Island and Gyeongju Historic Areas (designated in 2000); the Royal Tombs of the Joseon Dynasty (designated in 2009); and the folk villages of Hahoe in Andong and Yangdong in Gyeongju (designated in 2010). World Heritage sites in South Korea designated for their importance as natural sites include Jeju Volcanic Island and Yongam Lava Tubes (designated in 2007). There are eleven items of Korean cultural heritage included on the United Nations' "Memory of the World" list, to include the *Hunminjeongeum* ("Proper Sounds for the Instruction of the People," a fifteenth-century text that first promulgated the Korean Hangeul alphabet) and the *Joseon Wangjo Sillok* ("Veritable

Figure 3-26 South Korea's national parks

Records of the Joseon Dynasty," the vast historical record of Korea's Joseon Dynasty), both designated in 1997, and the *Jikji Simche Yojeol* (a fourteenth-century Buddhist text recognized as the world's first printed book) and *Seungjeongwon Ilgi* ("Diaries of the Royal Secretariat," a vast record of the activities of the Royal Secretariat spanning the Joseon Dynasty), both designated in 2001. There are sixteen items of Korean cultural heritage designated by UNESCO as "Masterpieces of the Oral and Intangible Heritage of Humanity," to include the Jongmyo Shrine ritual and ritual music, *pansori* (a tra-

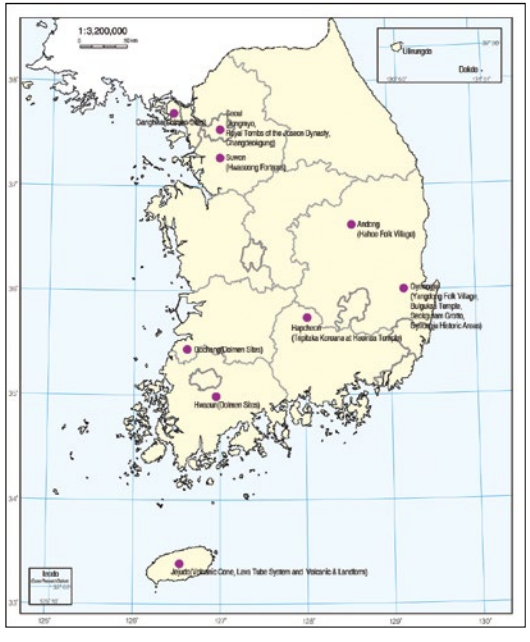

Figure 3-27 South Korea's Designated World Heritage Sites

ditional Korean form of musical storytelling), and the Gangneung Dano Festival (all so designated in 2008). Most recently, the tradition of kimchi making and sharing was added to the list in 2013.

Active promotion of festivals at the local level began in the latter half of the 1990s as part of a move to promote independent, creative local cultures and to increase returns on tourism. These regional festivals encompass the particular culture and industries as well as tourism characteristics of the given regions and as of 2012 there were a total of 758 such festivals: 113 in Seoul, eighty-five in Gyeongsangnam-do, seventy-eight in Gangwon-do, and seventy-three in Gyeonggi-do. Apart from those held in large metropolitan areas, many others are held in regional areas rich in cultural and tourism resources, such as Jeju City and Seogwipo on Jejudo Island and Gangneung in Gangwon-do.

Festivals can be categorized according to their objectives and defining characteristics: there are culture and arts festivals, tourism or local products festivals, and traditional folk culture festivals. As its name implies, a tourism or local product festival aims to promote and sell local products. Of Korea's 758 regional festivals, the largest number (about 310) can be categorized as tourism or local products festivals, followed by culture and arts festivals (237). Many local festivals are held with the aim at promoting tourism and the specialty products of a small area within a county. These festivals approach the area's natural and tourism resources and sales of local products as vehicles for stimulating the local economy. On average, South Koreans will visit a local festival about twice a year. As primary objectives for visiting such festivals, visitors often cite reasons having little to do with the nature of the festival itself, such as "to get away from daily cares and recharge," "to experience something new" or to buy local products at reasonable prices. Thus, a local festival is a good means of promoting one's own locale to the residents of another region—providing a good destination for a family outing, all while enhancing the local image and getting your region more widely known. This said, too many local festivals suffer from poor content and over commercialization of the locale, while their programs fail to sufficiently differentiate or accentuate the uniqueness of the festivals.

Issues and Problems in the Service Industry

Though South Korea's service industry is proportionally large, it is still dominated more by consumer industries such as wholesale and retail trade and food and hospitality compared with higher-value-added producer services. Thus the country is still facing the challenge of fostering the development of the expertise and creativity, as well as the cultural content, that forms the foundations of a knowledge-based service industry. What's more, there is also the real problem of the expertise on which the producer service industry relies becoming overly concentrated in the Seoul capital region and exacerbating regional development imbalances. In terms of the regional service industry, the relatively well-preserved natural environment and traditional culture found in the provinces have contributed to the growth of the regional tourism industry. The development of programs based upon a given region's tangible and intangible assets can serve to promote local identity and emotional solidarity while also generating tourism revenue by attracting outside visitors, promoting "experiential tourism," and through the sale of local speciality products. In particular, in order to maintain the "Korean Wave" phenomenon that in recent years has been so prevalent in Southeast Asia, as well as elsewhere in the world, efforts must be made to produce a variety of quality marketable content to export abroad, as well as to continue to attract foreign tourists.

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Part II

REGIONAL GEOGRAPHY

In terms of its administrative organization, as of 2014 South Korea consisted of one designated Special City, six Metropolitan Cities, one Special Self-Governing City (Sejong City), and nine provinces, including one Special Self-Governing Province (Jeju-do). The country's Special City is Seoul, which has served as the national capital since the founding of the Joseon Dynasty (1392–1910). The six Metropolitan Cities are Busan, Incheon, Daegu, Daejeon, Gwangju, and Ulsan, found respectively in the provinces of Gyeongsangnam-do, Gyeonggi-do, Gyeongsangbuk-do, Chungcheongnam-do, Jeollanam-do, and Gyeongsangnam-do. Five of these cities received their designations in 1995, while Ulsan was named a Metropolitan City in 1997.

South Korea's provincial administrative organization has its roots in an eight-province system established in 1413. The eight provinces established at that time were Gyeonggi, Chungcheong, Jeolla, Gyeongsang, Gangwon, Hwanghae, Pyeongan, and Hamgyeong, which endured for nearly five centuries until they were reorganized into thirteen provinces in 1896. Gyeonggi, Gangwon, and Hwanghae were not altered at that time, but the remaining five provinces were split into their northern and southern portions. Following the Korean War (1950–1953), portions of both Gangwon-do and Gyeonggi-do (the suffix *do* here means "province") came under the territorial control of North Korea. The portion of Gyeonggi-do that was lost to North Korea was incorporated into Hwanghae-do, whereas Gangwon-do underwent no name change, resulting in a Gangwon-do in each of the Koreas. In total, North Korea came to be made up of six provinces: Pyeongannam-do, Pyeonganbuk-do, Hamgyeongnam-do, Hamgyeongbuk-do, Hwanghae-do, and Gangwon-do.

In 1946, Jejudo Island was elevated to the status of province from its former position as an administrative subunit of Jeollanam-do, bringing the total number of provinces in South Korea to nine. Subsequently, North Korea established first Jagang-do and then Yanggang-do before subdividing Hwanghae-do, thus bringing up its total number of provinces also to nine.* In 2006, Jeju-do was named the country's only Special Self-Governing Province, and in 2012 Sejong City was launched as a Special Self-Governing City and provincial capital.

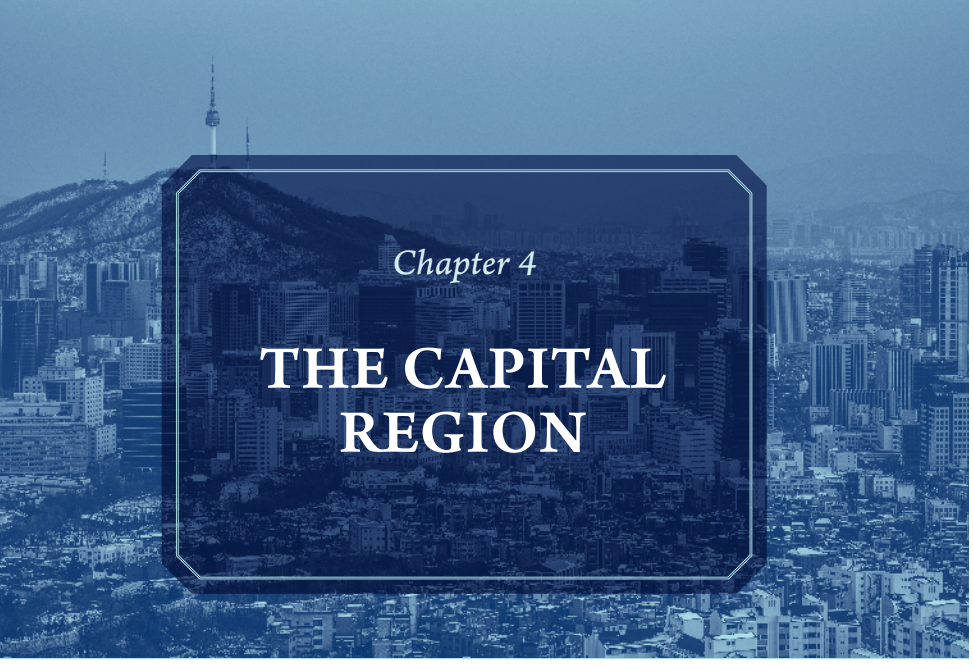
Thus the five-province system of Gyeonggi-do, Gangwon-do, Chungcheong-do, Jeolla-do, and Gyeongsang-do established in 1413 has led in South Korea to an administrative system of one Special City, six Metropolitan Cities, one Special Self-Governing City, eight provinces, and one Special Self-Governing Province. This system in South Korea, consisting of seventeen regional gov-

* North Korea observes a different romanization system, romanizing its nine provinces as Pyongannam-do, Pyonganbuk-do, Hamgyongnam-do, Hamgyongbuk-do, Hwanghaenam-do, Hwanghaebuk-do, Kangwon-do, Chagang-do, and Ryanggang-do. However, to avoid confusion, only the official South Korean romanization is used here.

ernments, is termed the local autonomous government system. However, the approach of this current work is to organize the chapters of this section according to Korea's traditional eight-province system, the reason being that such an organization characterized the peninsula for over five continuous centuries and effectively created separate cultural regions, each with its own characteristics. However, a separate chapter will be dedicated to the Capital Region—that is, to Seoul and Gyeonggi-do.

Administratively, cities consist of subunits known as districts (*gu*) and neighborhoods (*dong*), while at the provincial level there is a two-tiered subunit system consisting of cities (*si*) and counties (*gun*). Among cities (*si*) that fall administratively under a province, there are those that are further subdivided into autonomous districts (*gu*) and those that are not. Those cities with districts fall into a four-level administrative organization: province (*do*) ▸ city (*si*) ▸district (*gu*) ▸ neighborhood (*dong*). Those smaller cities without autonomous district subdivisions fall under a given county (*gun*), such that they fall within a three-level administrative organization: province *(do)* ▸ city (*si*) ▸ neighborhood (*dong*). Counties (*gun*) fall under a four-level administrative organization of province (*do*) ▸ county (*gun*) ▸ town/township (*eup/myeon*) ▸ village (*ri*). In terms of population, the unit termed "metropolitan city" should have a population of at least one million, while a city must have between fifty thousand and one million. To be subdivided into autonomous districts (and thus move out from under the administration of a county), a city must have at least five hundred thousand residents. For a *myeon* (township) to be elevated to the status of an *eup* (town), it must have at least twenty thousand residents.

The year 1995 saw the birth of a new form of city called the "urban-rural integrated city." All cities that in the past had broken free of their surrounding counties (*gun*) were administratively reintegrated into those counties. However, like counties, these cities can also have subordinate towns/townships/villages (*eup/myeon/dong*). For instance, one can find an administrative hierarchy of province ▸(integrated) city ▸ neighborhood (*dong*); or province ▸ (integrated) city ▸ town (*eup*) ▸ village (*ri*); or even province ▸ (integrated) city ▸ township (*myeon*) ▸ village (*ri*). Though there are provincial cities that have districts (*gu*), these fall within the hierarchy of province ▸ city ▸ district (*gu*) ▸ neighborhood (*dong*). Though somewhat complex, Korea's three-tiered administration system of Special City/Metropolitan City/Self-Governing City-District-Neighborhood or Province-City-Neighborhood exists alongside the four-tiered Province-City/County-District/Town·Township-Neighborhood/Village administrative structure.



Chapter 4

THE CAPITAL REGION

Seoul

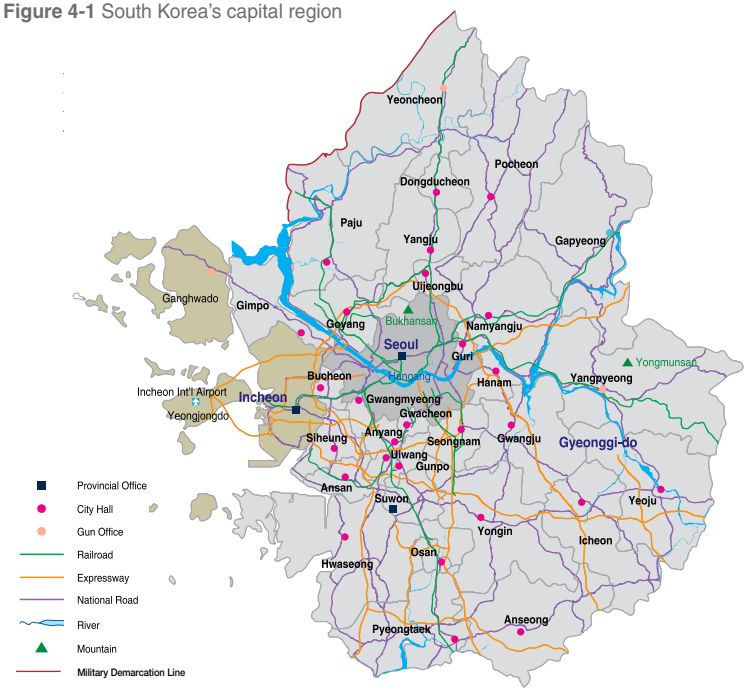
Extending some 30.3 kilometers north to south and 36.7 kilometers east to west, for a total area of 605 square kilometers, and with a total population (as of 2013) of 10,140,000, the capital of the Republic of Korea (or South Korea) is truly the country's political, economic, cultural, and transport center. Located in the central region of the peninsula, Gyeonggi-do makes up its surrounding outlying areas. Seoul's representative flower, tree, and bird are the forsythia, gingko, and magpie, while its mascot is the *Haechi* (a lionlike mythological beast also known as a *Haetae*).

Seoul currently has eighteen sister cities: Taipei, Ankara, Honolulu, San Francisco, São Paulo, Bogotá, Jakarta, Tokyo, Moscow, New South Wales, Paris, Mexico City, Beijing, Ulaanbaatar, Hanoi,

Warsaw, Cairo, and Rome. It served as the host city of the 1988 Summer Olympics and is one of twenty world cities with populations of over ten million.

Though Seoul comprises only 0.6 percent of South Korea's total territory, its population density is extremely high with about one out of every five South Koreans living there. The population density of Seoul is about 16,760 persons per square kilometer, making it not only the most population-dense self-governing metropolitan area in the country but also the most densely populated city among all OECD countries. It is eighteen times more densely populated than

Figure 4-1 South Korea's capital region



the country's least densely populated province, Gangwon-do (with ninety-two persons per square kilometer); eight times more densely populated than New York City (2,050 persons per square kilometer) and Sydney (2,100 persons per square kilometer); five times more than Rome (2,950 persons per square kilometer); four times more than Paris (3,550 persons per square kilometer) and Berlin (3,750 persons per square kilometer); and three times more than the Tokyo-Yokohama Metropolitan Area (4,750 persons per square kilometer) and London (5,100 persons per square kilometer).

Among the world's forty-three megacities with populations of over five million, Seoul ranks seven in terms of population density, surpassed only by Dhaka, Bangladesh (132,550 persons per square kilometer); Mumbai (29,650 persons per square kilometer) and Kolkata (23,900 persons per square kilometer), India; Karachi, Pakistan (18,900 persons per square kilometer); Lagos, Nigeria (18,150 persons per square kilometer); and Shenzhen, China (17,150 persons per square kilometer).

Seoul has served as a capital city since 1394, over 620 years. During the Joseon Dynasty (1392–1910) it was known as Hanseong or Hanyang, during the Japanese colonial period (1910–1945) it was called Gyeongseong (Keijo in Japanese), and it did not gain its current appellation until after liberation in 1945. The population of Seoul during the eighteenth century was about two hundred thousand. That figure had increased more than fourfold by 1940, when its residents numbered about 775,000 Koreans and 155,000 Japanese. The city's population first surpassed one million in 1942, reached five million by 1970, and by 1988 exceeded ten million.

Table 4-1 Population of Seoul broken down by district (*gu*)

Ranking	District (gu)	Population (2003)
1	Songpa-gu	668,415
2	Nowon-gu	590,479
3	Gangseo-gu	569,070
4	Gangnam-gu	563,599
5	Gwanak-gu	518,028
6	Eunpyeong-gu	503,660
7	Yangcheon-gu	492,528
8	Gangdong-gu	483,379
9	Seongbuk-gu	476,589
10	Seocho-gu	441,763
11	Guro-gu	424,964
12	Jungnang-gu	416,798
13	Dongjak-gu	410,815
14	Yeongdeungpo-gu	386,471
15	Mapo-gu	381,856
16	Gwangjin-gu	368,927
17	Dongdaemun-gu	364,273
18	Dobong-gu	358,582
19	Gangbuk-gu	338,707
20	Seodaemun-gu	314,110
21	Seongdong-gu	299,337
22	Geumcheon-gu	241,020
23	Yongsan-gu	239,740
24	Jongno-gu	160,070
25	Jung-gu	130,465
TOTAL	Seoul	10,143,645

Seoul's population peaked in 1992 at 10.97 million and then began a decline, falling to between 10.1 million and 10.5 million by 1995. As of 2013, among Seoul's twenty-five autonomous districts (*gu*), the most populous is Songpa-gu, followed by Nowon-gu, Gangseo-gu,

Gangnam-gu, Gwanak-gu, and Eunpyeong-gu, all of which have populations in excess of five hundred thousand (Table 4-1).

Among South Korea's cities, Seoul has the highest non-Korean population. Accommodation facilities catering to foreigners are concentrated in the neighborhoods of Insa-dong, Myeong-dong, Itaewon, Gangnam, Apgujeong-dong, and Gwangjang-dong. Seoul's heart is also a tourist district with many attractions such as Gyeongbokgung Palace, the National Folk Museum, the National Palace Museum, Cheong Wa Dae (the "Blue House," the president's residence), the Insa-dong artisan area, Bukchon Hanok (traditional Korean-style homes) Village, Changdeokgung Palace, Changgyeonggung Palace, the Royal Ancestral Shrine, Cheonggyecheon Stream, Seoul Museum of History, Jeongdong-gil (a picturesque pedestrian road in Seoul's historic center), Deoksugung Palace, Myeong-dong, Namsan Park, and the National Museum of Korea. Outside this central area, other parts of the city spotlighted in recent years are the neighborhoods of Hongdae and Sinchon as well as the Gangnam area south of the Hangang River (with its Apgujeong neighborhood, trendy Garosu-gil, the COEX exhibition center, Bongeunsa Temple, Lotte World, and Olympic Park, among other locales).

Seoul's landscape stands out from those of other megacities around the world in that it is bisected by a river—the Hangang River—and surrounded by mountains. The Hangang River is also larger than most rivers found in the world's other major capitals; it is spanned by bridges and banked by skyscrapers. Between the city's Gangnam ("south of the river") and Gangbuk ("north of the river") areas, more than twenty bridges cross the Hangang River, and at

Figure 4-2 Seoul's Gyeongbokgung Palace and Cheong Wa Dae

more than a kilometer in length they dwarf the bridges spanning the Seine in Paris or the Thames in London. The river presents a variety of visually impressive sites, from the Yanghwadaegyo Bridge to the Olympicdaegyo Bridge, from large-scale apartment complexes to Yeouido Island's 63 Building (named for its sixty-three floors), and from Lotte World to commercial skyscrapers.

Seoul is surrounded by mountains: Mt. Bukhansan, Mt. Dobongsan, Mt. Suraksan, Mt. Buramsan, Mt. Gwanaksan, and Mt. Ansan. Among these peaks, the most popular as recreational destinations for Seoulites, as well as the residents of nearby Gyeonggi-do, are Mt. Bukhansan (836 m) and Mt. Dobongsan (740 m) in the re-

gion north of the Hangang River, and Mt. Gwanaksan (629 m) south of the river. Especially during autumn and on pleasant weekends, the mountains are crowded with hikers. Such scenic landscapes are perhaps unique to Seoul, for what other global city can offer such high peaks not thirty minutes from the city's heart?

Gyeonggi-do

Based on 2013 data, the total area of Gyeonggi-do is 102,000 square kilometers, or about 10.1 percent of the total area of South Korea. Its population is 12,230,000, or about 23.9 percent of the country's total, while its population density is 1,202 persons per square kilometer. With a population higher than that of Seoul, Gyeonggi-do is the most populous of South Korea's seventeen self-governing administrative regions and the most densely populated of its provinces, even surpassing Ulsan Metropolitan City and Sejong Special Self-Governing City in terms of population density. Indeed, Gyeonggi-do is the only province with a population density above 1,000 persons per square kilometer, more than twice the average provincial population density of 510 persons per square kilometer.

Gyeonggi-do is situated at the heart of the Korean Peninsula and has a rounded shape. It extends approximately 150 kilometers from east to west and 140 kilometers from north to south. What is now Incheon Metropolitan City originally formed part of the province until 1981, when that city was promoted to the status of *jikhalsi*, a municipality directly under the administration of the central government. Today, Gyeonggi-do is composed of three counties (*gun*) and twenty-eight cities, the number of cities being relatively high compared with the country's other eight provinces. In 1995 two of the province's counties, Ganghwa-gun and Ongjin-gun, were incorporated into Incheon Metropolitan City. The city of Gaeseong, as the country of Gaepung-gun, (Kaepung) and portions of the county of Jangdan-gun (Changdan), which are currently in North Korean territory, were traditionally a part of Gyeonggi-do.

The name "Gyeonggi" derives from the Sino-Korean words for "capital" (*gyeong*) and "area surrounding the capital" (*gi*). During the Goryeo Dynasty (918–1392), the capital was established at Gaeseong (Kaesong), and the surrounding area—generally termed *gyeonggi*—was divided into administrative units termed *gihyeon* and *jeokhyeon*. As the Goryeo period progressed, this capital-area territory or *gyeonggi* continued to expand until it was the size of a province. With the founding of the Joseon Dynasty (1392–1910), the dynastic capital was moved south to Hanseong (present-day Seoul), and the surrounding territory shifted south as well. The administrative structure of the Goryeo Dynasty had divided the national territory into five provinces (or *do*) and two so-called *gye*. Among the five provinces that existed at the time, Yanggwang-do comprised what is today Gyeonggi-do, Chungcheongbuk-do, and Chungcheongnam-do. But in 1413, with the administrative reforms of the newly established Joseon Dynasty, Yanggwang-do was absorbed into the new eight-province system.

In terms of its topography, the terrain of Gyeonggi-do is generally elevated in the east and slopes gradually downward as one moves west. The highest mountain peaks in the province, which rise over

1,000 meters, are in Pocheon and Gapyeong-gun; one can also find peaks over 500 meters high extending between Yangpyeong-gun and the Yeoju-Anseong area. The province's west is a coastal area where one finds the Gimpo, Ilsan, Pyeongtaek, and Anseong Plains. The terrain here consists generally of floodplains or alluvial plains that find primary use as paddy fields. Beginning in the mid-1990s, such plains in the vicinity of Seoul became preferred locales for the development of new planned cities. Newer residential areas such as Sanggye-dong in Seoul, Ilsan-gu in Goyang, Bundang-gu in Seongnam, and Pyeongchon-dong in Anyang were all built on the alluvial plains of tributaries of the Hangang River.

Gyeonggi-do may be divided into the Yellow Sea coastal area and the basin zones of the Imjingang River, the Hangang River, and the Jinwi-Anseongcheon Stream. In the Imjingang River basin can be found cities such as Paju, Yeoncheon, Dongducheon, and Pocheon. The province's Hangang River basin includes the cities of Gapyeong, Yangpyeong, Yeoju, Icheon, Seongnam, Namyangju, Uijeongbu, Anyang, Bucheon, Gimpo, and Goyang; while the Jinwi-Anseongcheon Stream basin contains the cities of Anseong, Suwon, and Pyeongtaek. In the province's Yellow Sea coastal area are found cities such as Ansan and Hwaseong. The body of water to the west of Gyeonggi-do is called Gyeonggiman Bay. The coast of Gyeonggiman Bay is highly asymmetrical with many inlets and islands. Almost all the islands found in the bay—including its largest, Ganghwado Island—belong administratively to Incheon Metropolitan City. From an early date the closest offshore islands, such as Ganghwado, Gyodongdo, Daebudo, Yeongheungdo, and

Yeongjongdo Islands, were linked by bridge to the mainland such that in a sense they ceased to be islands. Ganghwado Island is famous worldwide for extreme tidal fluctuations. The spring tidal range at Incheon (8.1 meters) is only slightly less than that found in the country's Asanman Bay (8.5 meters). Gyeonggiman Bay has a long coastline, while rivers like the Hangang and Imjingang Rivers, and streams such as the Anseongcheon Stream, carry sediments to the coast, contributing to the formation of extensive tidelands. Notably, the tidelands of Ganghwado Island's Janghwa-ri are famous worldwide.

In the 1980s, the South Korean population was entering a stabilization period following a period of demographic transition. During the years 1985–1990, the annual population growth rate fell to 1.4 percent. In terms of regions, however, annual population growth increased at a rate above the national average for the six major cities of Seoul, Busan, Incheon, Daegu, Daejeon, and Gwangju, as well as for the province of Gyeonggi-do. During this period, the annual population growth rate was highest in Incheon (5.6 percent), followed by Gyeonggi-do (5.1 percent). As Incheon was incorporated as part of Gyeonggi-do until 1981, this can be seen more broadly as the phenomenon of population concentration in Gyeonggi-do throughout the decades of the 1970s and continuing into the 1980s. Compare this with Gyeongsangnam-do and Jeju-do, whose annual population growth rates during this period of 0.9 and 1.0 percent, respectively, were below the national average; and the provinces of Gangwon-do, Chungcheongbuk-do, Chungcheongnam-do, Jeollanam-do, Jeollabuk-do, and Gyeongsangbuk-do, which all had

negative growth rates and population declines.

The population growth of the Gyeonggi-do region in the 1990s is also worth noting. If one analyzes the very modest 0.6 percent average annual population growth rate for South Korea during the period 1990–1995, Seoul for the first time experienced a negative population growth rate of - 0.7 percent, while Busan also experienced its first negative population growth rate during this period (- 0.75 percent). In contrast to the overall average population growth rate for cities during this period, which stood at 1.64 percent, on average the nation's provincial counties (*gun*) experienced a population drain, with the average population growth rate shrinking significantly to –2.9 percent. Meanwhile, Gyeonggi-do continued to experience a population rise during the 1990s: 4.4 percent for the period 1990–1995 and then 3.2 percent for the period 1995–2000, the highest rate for any administrative region in South Korea during this period. During the five years from 1995 to 2000, Gyeonggi-do's population increased by some 1.29 million, accounting for 94 percent of the national population growth of 1.37 million during this period. It is no exaggeration to say that Korea's overall population growth in the 1990s was driven almost solely by the growth of Gyeonggi-do.

Although the annual population growth of cities from 1970 to the present has been on the rise in contrast to the slowing of population growth nationwide, Gyeonggi-do is singular in that it continues to demonstrate a rapid population increase. The most important factor contributing to this phenomenon was the official policy of industrialization commencing in the 1960s and the concomitant rapid urbanization. Whatever the reasons, what is clear is that over the last

fifty or so years Gyeonggi-do has proven the most popular choice for those Koreans electing to move to a new locale.

Naturally, Seoul's population distribution policies have been a primary factor, but regardless, Gyeonggi-do's population rise has meant that changes in land-use patterns in that province have been more sudden and widespread than in other regions. New residential areas were built to accommodate the new arrivals, this attracted new business enterprises that provided livelihoods, new streets emerged where none had existed, and for the most efficient use of limited land skyscrapers were constructed. Gyeonggi-do had embarked upon the road to urbanization. The result by 2013 was a total of some 12.2 million residents in the province. Furthermore, twenty-eight of the province's thirty-one local autonomous entities—all but the three counties of Yeoncheon-gun, Gapyeong-gun, and Yangpyeong-gun—were cities.

Gyeonggi-do is the most dynamic and fastest developing of South Korea's seventeen local autonomous governments. The primary reason for Seoul's population stagnation starting from the mid-1990s was that city's population drain toward Gyeonggi-do. People began taking up residence in the aforementioned suburban areas, which were being constructed on Seoul's periphery. These areas, symbolized by their large-scale apartment complexes, were initially constructed as part of satellite cities abutting Seoul, but gradually they began to be erected further from the capital, in places like Yongin, Suwon, Hwaseong, and Pyeongtaek. Gyeonggi-do has not only been experiencing a population influx from neighboring Seoul, but since the 1970s industrialization has also brought in new resi-

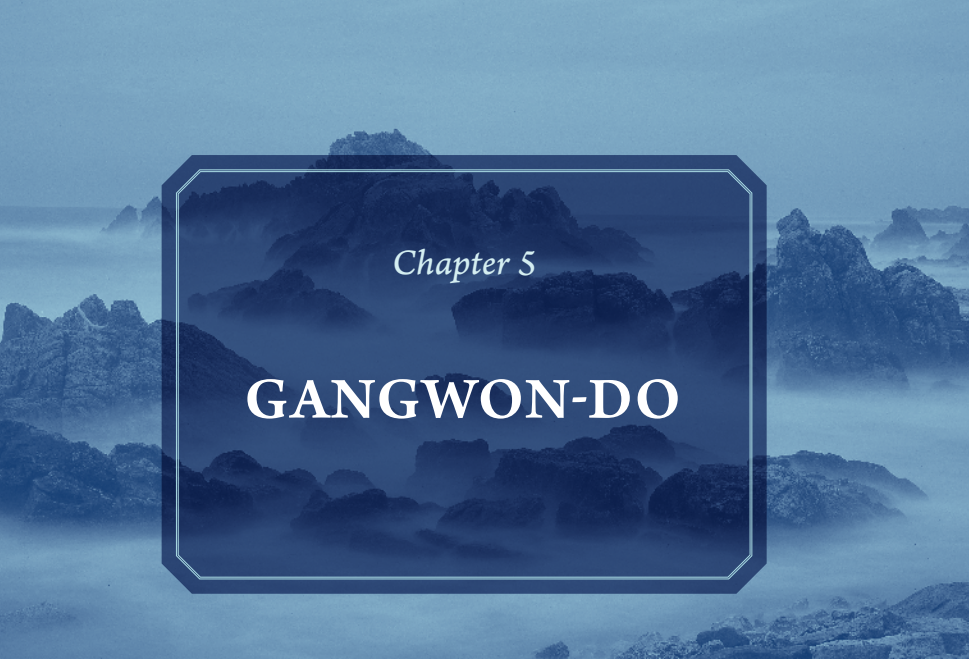
Figure 4-3 Suwon Hwaseong Fortress

dents from regional areas beyond Gyeonggi-do, due primarily to the lower housing rents available there compared with Seoul while still offering access to the capital.

Though the western coastal area of Gyeonggi-do, to include Gimpo, Hwaseong, and Pyeongtaek, had much of the country's arable land, over the last quarter century the percentage of its arable land relative to all land in the province has dropped from 25 percent to 18 percent. With the exception of the mountainous eastern area of the province, most arable land in the province consists of wet paddy fields rather than dry fields, although the proportion of dry fields is on the rise. Traditionally, the rice produced in Gyeonggi-do,

widely known as "Gyeonggi *mi*" (Gyeonggi rice), has enjoyed great popularity, with the varieties from Yeoju and Icheon particularly famed for their quality. Driving along the province's National Road 3 or National Road 37 you will come across no shortage of restaurants with names like "*ssal bap jip*" (house of rice) or "*dolsot bap jip*" (house of stone bowl rice), where rice dishes constitute the main options. Besides this, on the outskirts of the province's large cities the cultivation of vegetables and flowers flourishes along with animal husbandry.

Gyeonggi-do is also home to large-scale industrial facilities on the outskirts of Seoul. What is termed the Gyeongin ("Seoul–Incheon") industrial belt originally formed along the Seoul–Incheon axis but eventually expanded to the Seoul–Suwon axis.



Chapter 5

GANGWON-DO

The name "Gangwon" was coined in the early fifteenth century, a combination of the "Gang" from Gangneung, a major provincial city on the province's eastern coast, and the "Won" from Wonju in its western region. The province can effectively be divided into east and west, with the two sides traditionally termed Yeongdong ("east of the passes") and Yeongseo ("west of the passes"). The Yeongdong region is the coastal portion that lies to the east of the north-south-running Taebaek Mountain Range and its high point at Daegwallyeong (832 meters); conversely, the Yeongseo region lies to the west of this line.

As of 2013, the population of Gangwon-do was 1.54 million, or about 3 percent of the total population of South Korea, making it—along with Jeju-do, whose population is about 1.2 percent of the total—one of the country's least populous provinces. With an area of 16,830 square kilometers (or 16.8 percent of the total for South Korea), it is along with the Gyeongsang and Jeolla provinces one of the three largest provinces in terms of landmass. The population density of Gangwon-do is about 91.6 persons per square kilometer, the lowest level among the country's seventeen autonomous governing regions. (The average population density for South Korea as a whole is 510.1 persons per square kilometer.) Clearly, the major factor is the presence of mountains that cover the province. Gangwon-do also has about 13,804 square kilometers of forested area, or slightly more than one-fifth (or 21.5 percent) of the country's total forested area (64,176 square kilometers).

The distinct geological features of southeastern Gangwon-do

Figure 5-1 South Korea's Gangwon-do

are its thick layers of high-quality limestone from the Joseon and Pyeongan Supergroups. Gangwon-do and neighboring Chungcheongbuk-do are the country's primary producers of limestone, and it is believed that their mines are capable of remaining productive for another two millennia. Accordingly, the cement industry has developed in Gangwon-do, and the region is also full of karst topography, such as the massive limestone of Hwanseongul Cave (Natural Treasure No. 178). The Pyeongan Supergroup, which encompassed the entire area around Jeongseon and Taebaek, also produced buried coal deposits. Though limestone and coal constituted Gangwon-do's most important natural resources since the advent of the twentieth century, the 1980s began to see the closure of almost all the country's coal mining industries. Within Jeongseon-gun, the town of Sabuk-eup, once famed for its coal-mining, has been transformed into a tourist destination with the development of the Kangwon Land casino and resort.

Gangwon-do's most prominent feature is the peninsula's most rugged mountain terrain, an elongated range stretching in a north-south alignment along the east coast. The Taebaek Mountain Range rises abruptly on its eastern side but has a more gradually sloping western face. Viewed from the East Sea, the range is a truly magnificent sight. Because of the range's sheer eastern face, the terrain of the province's Yeongdong region drops abruptly toward the shoreline, resulting in sparse plains, rivers that are short and fast moving, and a limited basin area.

The Taebaek Mountain Range's watersheds are distributed among high peaks such as Mts. Seoraksan (1,708 m), Odaesan (1,563 m), Dutasan (1,353 m), and Taebaeksan (1,567 m); but to the west of these can also be found high peaks in excess of 1,000 meters, such as Mt. Gyebangsan (1,577 m), Mt. Gariwangsan (1,561 m), Duwibong Peak (1,466 m), Mt. Taegisan (1,261 m), and Mt. Chiaksan (1,288 m). Besides these, Gangwon-do also has some smaller peaks that have long been renowned as mountain passes, such as Daegwallyeong (832 m), Hangyeryeong (920 m), Misiryeong (767 m), Jingogae (940 m), and Jinburyeong (520 m), all of which separate Yeongdong from Yeongseo—that is, east from west.

In the Yeongseo region, the land rises more gently. Even terrain over 700 meters above sea level has very gentle slopes and a topography of high, flat summits that can still be developed. Because of such natural geological features, the Yeongseo region has long attracted slash-and-burn farmers, and with the development of transportation the region's cooler elevations became famed for their production of Chinese cabbages in summertime, which could then be readily moved to market. In the 1990s, the sports and leisure industry began to develop in earnest and one aspect of this was the establishment of ski resorts in the Yeongseo region. Of particular note are the Alps Ski Resort (1971) in Jinburyeong and the Yongpyeong Ski Resort (1975) in Daegwallyeong, which were the first ski slopes to open in Korea.

Due to its coastal position, the Yeongdong region has on average temperatures 2°C higher than those of the Yeongseo region. And in terms of average annual precipitation, the Yeongdong region receives about 2,000–2,100 millimeters annually, some 300–400 millimeters more than Yeongseo (1,600–1,700 millimeters). Gangwon-do

also receives more snow than any other region of the country. Some areas of the Taebaek Mountain Range in particular have experienced heavy snowfalls of 1–2 meters. The province's Pyeongchang-gun was selected as the host of the 2018 Winter Olympics.

With some 80 percent of Gangwon-do's territory covered by mountains, only 9.6 percent of it is arable land, the lowest percentage of any province. Of this, about 6.2 percent is given over to dry field cultivation while about half that (3.4 percent) is paddy fields, but with the recent growth in arable land, the percentage of dry fields is increasing. Dry field crops include corn and potatoes as well as vegetables such as radishes and some varieties of cabbage. Of particular note is the highland Chinese cabbage (*baechu* in Korean), grown in those regions at an elevation of around 1,000 meters. Cultivated in the relatively cool climate such elevations enjoy even in summer, it is something not found in other areas and has become an important cash crop for local farmers. Because it is the primary ingredient in kimchi, the most important of Korean foods, all Koreans, whether country or city dwellers, view *baechu* as one of the most important vegetables.

The offshore area of eastern Gangwon-do has long been recognized as providing ideal fishing grounds due to the intersection there of cold and warm ocean currents. However, due to global warming, fishing catches there have been declining. Though Gangwon-do's East Sea coast is known for its superior pollack (which are frozen or dried) and squid, these days most supplies consist of imports. In terms of fishing ports, important in Gangwon-do are Sokcho, Jumunjin, Mukho, Samcheok, and Geojin, though in fact the province is dotted with small and sleepy ports that reward the visitor with their picturesque beauty.

Figure 5-2 A small port in Samcheok, Gangwon-do

As of 2014 Gangwon-do had seven cities and eleven counties. Besides the provincial seat of Chuncheon, its cities are Wonju, Sokcho, Gangneung, Donghae, Taebaek, and Samcheok. Among these, Sokcho, Gangneung, Donghae, and Samcheok are located on the East Sea coast. Although the Yeongdong region of the province is fairly narrow, it is more urbanized relative to the western Yeongseo region. Traditionally, Gangneung and Wonju were the province's major cities, but after becoming the provincial capital in 1910, Chuncheon also grew into a major city. Gangwon-do's counties are Hongcheon-gun, Hoengseong-gun, Yeongwol-gun, Pyeongchang-gun, Jeongseon-gun, Cheorwon-gun, Hwacheon-gun, Yanggu-gun, Inje-gun, Goseong-gun, and Yangyang-gun.

The most populous city in Gangwon-do is Wonju with 311,000

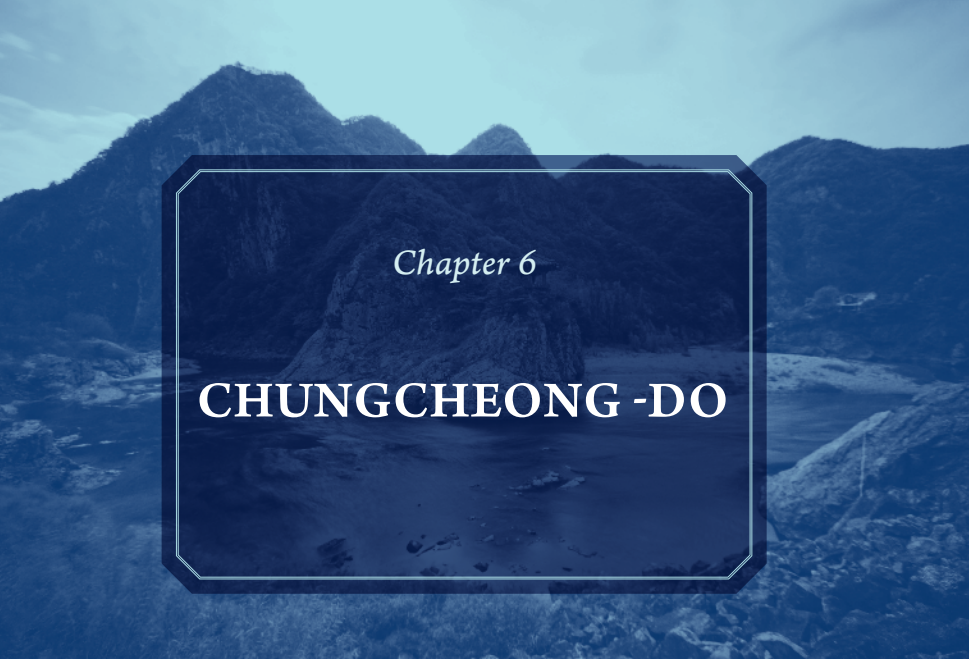
people, followed by the provincial capital of Chuncheon with 276,000. Wonju's status as the largest city in Gangwon-do owes much to the development of national highways, beginning with the Yeongdong and Jungang Expressways, which pass through it, greatly increasing its accessibility to Seoul. None of the province's other cities or counties surpass 100,000 in population except Gangneung with 217,000 people. Indeed, with the exception of Hongcheon-gun, none of its counties even reach 50,000 in population.

Highly mountainous, with little industry, and with an extensive

Figure 5-3 Uisangdae Pavilion at Naksansa Temple, Gangwon-do

coastline, Gangwon-do is the country's premier tourist destination, offering locales from Seoraksan National Park to an eastern coast dotted every few kilometers with swimming beaches. It is practically a truism to say that half of Koreans spend their summer holidays in Gangwon-do. In addition to the Yeongdong Expressway, which opened in 1975 and connects Seoul, Wonju, Daegwallyeong, and Gangneung, a number of other roads have been built since 2000, bringing in significant numbers of tourists.

Gangwon-do's northern border touches North Korea. Tourism trips to Mt. Geumgangsan in North Korea by land depart from the province's Goseong-gun. In such places as Cheorwon-gun and Goseong-gun, one is able to look down on the DMZ from observation platforms. Besides these observation platforms, the province offers plenty to attract the international tourist, such Chuncheon's spicy chicken, Namiseom Island, Gangchon, Cheongpyeongsa Temple, Sokcho's *abai sundae* (a North Korean–style sausage), the Hwajinpo lagoon, Gangneung's Gyeongpo Lake area, Mt. Odaesan, the beachside town of Jeongdongjin, Naksansa Temple, Hwanseongul Cave in Samcheok, Haesindang Park, Mt. Taebaeksan outside the city of Taebaek, Kangwon Land in Jeongseon, and Mt. Chiaksan in Wonju.



Chapter 6

CHUNGCHEONG -DO

The name "Chungcheong" was coined in the early fifteenth century as a fusion of the names of the former province's two largest cities: Chungju and Cheongju. The region that constitutes the Chungcheong provinces is also known as Hoseo, meaning literally "west of the lake"—*ho* meaning lake—though what lake the name refers to is uncertain. Some posit that it is the Uirimji Reservoir in Jecheon, while others consider it to refer to the Geumgang River, which in the region of Buyeo-gun was once referred to as the Baekhogang River. As with the former provinces of Jeolla-do and Gyeongsang-do, in 1896 Chungcheong-do was split into south and north.

As of 2013, the combined population of the Chungcheong provinces (Chungcheongnam-do and Chungcheongbuk-do) was 3.6 million (or about 7.1 percent of the national population), making it the third-least-populous region in Korea (after Jeju-do and Gangwon-do,

which contain 1.2 percent and 3 percent of the population, respectively). Their combined total land mass is 15,612 square kilometers (or 15.6 percent of the national total), making it after Jeju-do (1.8 percent) the second-smallest region. This said, due to its small size the Chungcheong provinces' population density is relatively high at 231.9 persons per square kilometer, placing it third in terms of population density—behind the extremely dense Gyeonggi-do (1,203 persons per square kilometer) and Jeju-do (321.1 persons per square kilometer).

One reason for this relative population density is that, with the exception of Jeju-do, the former Chungcheong-do has both the lowest proportion of forested land and the least territory of any province. Its terrain is largely flat and low-lying and so from ancient times it has been settled and developed, and though these settlements were small in scale they were widespread. The forested portions of the Chungcheong provinces comprise 14.2 percent of all forested land in South Korea, while their dry and wet (paddy) fields constitute 20.4 per-

Figure 6-1 South Korea's Chungcheong region

cent and 18.4 percent, respectively, of the national total of such fields. Forested land constitutes 67.9 percent of Chungcheongbuk-do's land and 50.5 percent of Chungcheongnam-do's. Chungcheongnam-do has a slightly lower percentage of forested land than Gyeonggi-do (53.4 percent), making it the second-least-forested province (after Jeju-do with 47.5 percent).

Chungcheongbuk-do

In 1896, when Chungcheong-do was split, the capital of Chungcheongbuk-do was established at Cheongju. Excluding Jeju-do (or Jeju Self-Governing Province), Chungcheongbuk-do with a population of 1.57 million (3.1 percent of the national total) vies with Gangwon-do (1.54 million) as one of the country's most sparsely populated provinces. But differentiating it from Gangwon-do are its more limited territory (7,407 square kilometers, or 7.4 percent of the national total) and a population density (212.3 persons per square kilometer) more than double that of Gangwon-do. This said, however, generally speaking the province is mountainous and its population density is not especially high. Of the country's nine provinces, Chungcheongbuk-do is the fourth least populous—trailing only Gangwon-do, Gyeongsangbuk-do, and Jeollanam-do.

The geological structure of Chungcheongbuk-do is formed by the Joseon Supergroup extending from the counties of Samcheok, Jeongseon, and Yeongwol in Gangwon-do to Chungcheongbukdo's Danyang-gun, and the Okcheon Group stretching in a wide belt from Danyang-gun to Wanju-gun in Jeollabuk-do—in both regions, the basic skeleton is granite. Cement manufacturing businesses have developed around the limestone of the Joseon Supergroup (composed of sedimentary rock). At a mountain composed entirely of limestone, subterranean mining is not necessary; the limestone can be quarried in an open-pit mining process.

In terms of topography, Chungcheongbuk-do is generally mountainous with few plains. Those peaks exceeding 1,000 meters in altitude, such as Mt. Sobaeksan (1,440 m), Mt. Songnisan (1,058 m), and Mt. Minjujisan (1,242 m), are largely scattered along the Sobaek Mountain Range, which straddles neighboring Gyeongsangbuk-do. The Sobaek Mountain Range is a prominent stem of the Taebaek Mountain Range and a watershed of the Hangang, Geumgang, and Nakdonggang Rivers. The area extending across Danyang-gun, Jecheon, Chungju, Eumseong-gun, and Goesan-gun constitutes a watershed for the Hangang River, while the area to the west of this is the basin of the Geumgang River. The Sobaek Mountain Range has several famous mountain saddles that serve as passes, including Jungnyeong Pass (689 m), Ihwaryeong Pass (548 m), and Chupungnyeong Pass (200 m). Due to its inland location, Chungcheongbuk-do generally has a continental climate with wide annual temperature fluctuations. The province's mountainous eastern region can be particularly frigid in winter. Its annual average precipitation is about 1,200 millimeters, comparable to the rest of the country.

With nearly 70 percent of the province covered in mountains, the proportion of cultivatable land stands at no more than 20 percent. The province's paddy fields are found prominently developed on the

alluvial plains of the Mihogang River, a tributary of the Geumgang River. In this area's Cheongju, Jincheon-gun, Eumseong-gun, and Boeun-gun, paddy fields are more prevalent than dry fields; while in Jecheon and Danyang-gun dry fields far outnumber paddy fields. However, as percentages of the total land area, the two types of fields are nearly equal, with paddy fields accounting for 8.7 percent and dry fields 8.9 percent. Chungcheongbuk-do has long been renowned for its chili peppers, sesame, tobacco, and ginseng. Chungju is famed for its apples, and in recent years Yeongdong-gun has been seeing a thriving viticulture and wine industry.

As of 2014, Chungcheongbuk-do had three designated cities (Cheongju, Chungju, and Jecheon) and eight counties (Boeun-gun, Okcheon-gun, Yeongdong-gun, Jeungpyeong-gun, Jincheon-gun, Goesan-gun, Eumseong-gun, and Danyang-gun). Of these, the most populous is the provincial capital of Cheongju (830,000), which accounts for about 52.7 percent of the total provincial population. This

Figure 6-2 The eight-storied pagoda of Beopjusa Temple, Chungcheongbuk-do

is followed by Chungju (201,000) and Jecheon (139,000). Among the counties, the most populous is Eumseong-gun with 102,000, with the remainder of the counties varying between thirty thousand and seventy thousand people. During the Joseon Dynasty, Chungju was the largest city in Chungcheong-do, but this changed during the Japanese colonial period, notably after the opening of the Chungbuk rail line, when Cheongju began a period of continuous growth that saw it rise to become the province's major city. In more recent years the construction in Cheongju's Osong-eup of the National Bio Industrial Complex, or Osong BioValley, as well as the Health and Medicine Administrative Town, has meant the emergence of Cheongju as a bioindustrial and administrative center.

Transport to and within Chungcheongbuk-do is made convenient by the network of national highways (the Gyeongbu, Jungbu, and Jungang Expressways) and railways (the Jungang, Chungbuk, and Gyeongbu lines) that keep it well connected. It also boasts many renowned tourist sites, notable among them being the national parks of Mts. Songnisan, Woraksan, and Sobaeksan; Danyang-gun's Dodam Sambong Peaks ("Three-Peak Island"), Gosudonggul Cave, and Guinsa Temple; Chungju's Jungangtap Park (Central Pagoda Park) and Suanbo Hot Springs; Goesan-gun's Hwayang Valley; Beopjusa Temple in Boeun-gun; and Botapsa Temple in Jincheon-gun.

Chungcheongnam-do

Traditionally, Chungcheongnam-do's major cities were Gongju and Hongseong-gun, but with the advent of the Japanese colonial

period and the completion of the Gyeongbu railway the new city of Daejeon grew to be the province's largest city. In 1989, Daejeon was elevated to the status of *jikhalsi*, a municipality directly under the administration of the central government, and as such became administratively separate from Chungcheongnam-do. In 1995 it became one of the country's first five metropolitan cities (*gwangyeoksi*). The capital of Chungcheongnam-do was originally Gongju, but in 1932 the provincial seat was transferred to Daejeon, and then in 2013 to Hongseong-gun. The population of Chungcheongnam-do is 2.05 million, about 4 percent of the national total. The population of Daejeon is 1.53 million, about 3 percent of the national total. The province's total area is 8,204 square kilometers (8.2 percent of the national territory), while its population density is 250 persons per square kilometer, making it the fourth most densely populated province (after Gyeonggi-do, Gyeongsangnam-do, and Jeju-do).

The geological makeup of Chungcheongnam-do is composed primarily of granite and metamorphic formations. The Nampo Supergroup in Boryeong includes coal deposits, but these are no longer being mined. The former coal mine in Boryeong has been converted into the Boryeong Coal Museum. The central and southeastern regions of Chungcheongnam-do are mountainous. Peaks of the central region include Mt. Seonggeosan (570 m), Mt. Seongjusan (680 m), Mt. Gayasan (678 m), and the region's highest peak, Mt. Oseosan (791 m); while the southeastern region includes Mt. Seodaesan (904 m), Mt. Daedunsan (878 m), and Mt. Gyeryongsan (833 m). Among these, Mt. Gayasan in Cheongyang-gun and Mt. Gyeryongsan in Daejeon enjoy national renown. Mt. Gyeryongsan in particular was until the 1960s a center of shamanism. Sindoan in Gyeryong at the foot of Mt. Gyeryongsan was originally chosen as the site for the new capital of the Joseon Dynasty (1392–1910) before it was changed to Seoul. Today it is home to the Supreme Command, the headquarters of the South Korean army.

The southeastern portion of Chungcheongnam-do is the basin of the Geumgang River. In the upper portion, one finds Asan, Yesan-gun, and Hongseong-gun situated, respectively, in the basins of the Gokgyocheon, Muhancheon, and Sapgyocheon Streams, which empty into Asanman Bay. Seosan, Taean-gun, Dangjin, and Boryeong are situated along smaller rivers that flow toward the Yellow Sea. Because the province's Taean Peninsula projects into the sea, the coastline extending from its northern tip and along neighboring Anmyeondo Island is sandy and famous for its many swimming beaches, such as Sinduri, Mallipo, Mongsanpo, Kkotji, and Baramarae. Sinduri in particular is noted not only for its sand beaches but for its many inland sand dunes. Because the coastline here is meandering and the surf mild, land reclamation work has long been under way in the area. In Sapgyo, Daeho, Seokmun, and Seosan seawalls are being erected and the coast is gradually extending further out as a result. The average mean temperature for the province is 12°C (53.6°F), with the average August temperature at 25°C (77°F) and the average January temperature a relatively mild −3°C (26.6°F) or higher, about the typical climate for the central region of the peninsula.

The percentage of forested land in Chungcheongnam-do is as low as 50 percent, with just over 30 percent of the land under cultivation: 21.1 percent paddy fields and 9.4 percent dry fields. Areas on the

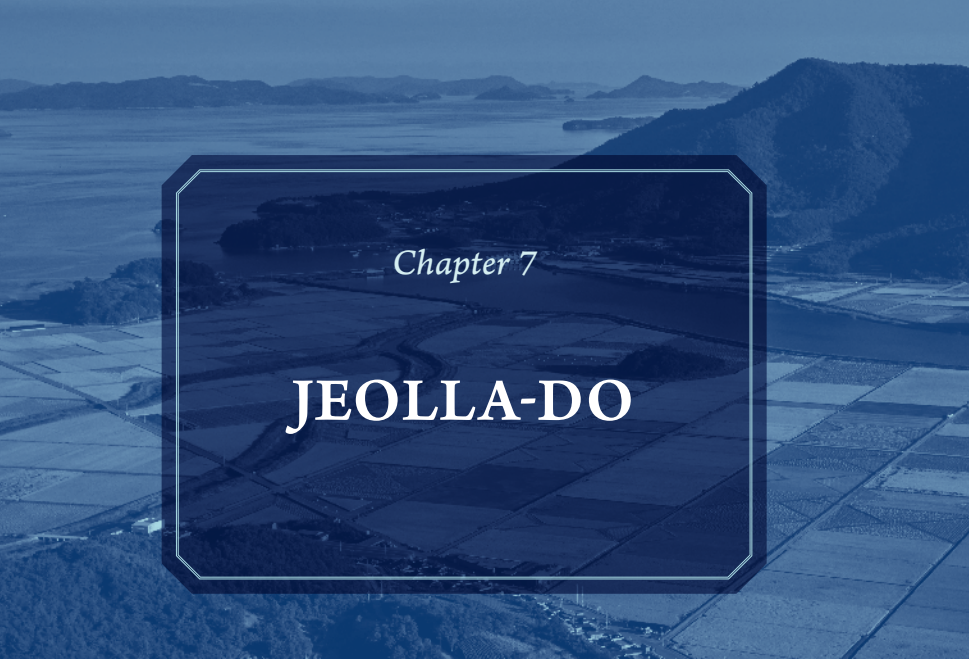
lower reaches of the Geumgang River, such as Nonsan and Buyeo, and areas with wide swaths of reclaimed land, such as Dangjin, Asan, Seosan, and Seocheon, are largely dedicated to rice cultivation. Seosan and Taean-gun in particular are renowned for their upland cultivation of garlic, chili peppers, and ginger. The province's fisheries are usually small, although coastal Anheung, Ocheon, and Guneop have large fishing ports. Catches are not typically large but they are rich in terms of species and seasonal fresh seafood is available throughout the year, the primary catches being anchovies, blackmouth anglers, shrimps, cuttlefishes, crabs, oysters, and clams. The salted shrimp of Gwangcheon-eup in Hongseong-gun and Nonsan enjoy nationwide distribution.

As of 2014, Chungcheongnam-do had eight designated cities (Cheonan, Gongju, Boryeong, Asan, Seosan, Nonsan, Gyeryong, and Dangjin) and seven counties (Geumsan-gun, Buyeo-gun, Seocheon-gun, Cheongyang-gun, Hongseong-gun, Yesan-gun, and Taean-gun). Among these administrative units, the most populous is Cheonan (590,000), followed by Asan (290,000). The rest of the cities have populations between 104,000 and 166,000, with the exception of Gyeryong with only forty-one thousand. Sitting along the Gyeongbu (Seoul–Busan) Expressway, the Gyeongbu Railway (Honam Line), and the route of the high-speed KTX, the city of Cheonan has long been a major transportation hub. Among the province's counties, the most populous is Hongseong-gun with a population of eighty-nine thousand while the least populous is Cheongyang-gun with thirty-two thousand.

Buyeo-gun and Gongju are representative of Baekje culture and

as such are home to the Buyeo and Gongju National Museums. Buyeo's Mt. Busosan, Nakhwaam Rock, Gungnamji Pond, and Royal Tombs of the Baekje Kingdom draw many tourists, as do Gongju's Gongsanseong Fortress and Tomb of King Muryeong. Gongju is also famed as the hometown of pro golfer Pak Se-ri and pro baseball player Park Chan Ho, and one can see sculptures of these figures around town. In addition, Chungcheongnam-do has many other sites to visit and local specialties to taste, from Mt. Gyeryongsan (Donghaksa Temple, Gapsa Temple) and Taeanhaean National Park to Mt. Daedunsan and Mt. Chilgapsan Provincial Parks and Deoksan-myeon. Locales like Onyang, Dogo, Yuseong, and Deoksan also enjoy established renown as hot springs and resorts. In the summer season large and small beaches along the province's coast open up. Particularly popular among international visitors is the Daecheon Beach Mud Festival.

Figure 6-3 Gongsanseong Fortress in Gongju, Chungcheongnam-do



Chapter 7

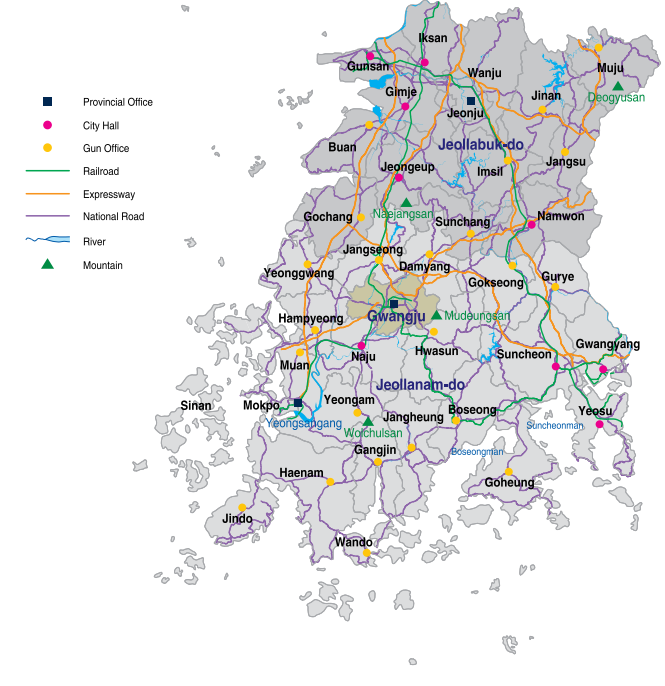
JEOLLA-DO

The name "Jeolla" was coined in the early fifteenth century from the names of what were then the region's largest cities: Jeonju, in today's Jeollabuk-do, and Naju, in today's Jeollanam-do. (Phonetically, in Korean the combination of "jeon" and "na" produces "jeolla.") Traditionally, the Jeolla region is also referred to as Honam, meaning literally "south of the lake." Though the body of water this name refers to is the subject of much debate, it is widely believed to be the Byeokgolje Reservoir in Gimje. Still others posit that the name derives from the Chinese name Hunan and does not refer to any specific landmark or geographical feature.

As of 2013, the combined population of the Jeolla provinces (Jeollanam-do and Jeollabuk-do) was 3.78 million, making Jeolla the third-most-populous region (after Gyeonggi-do, with 12.23

million, and the Gyeongsang provinces, with 6.03 million). The Jeolla region's total land area is 20,370 square kilometers, making it the largest region except for Gyeongsang. With a small population relative to the size of the landmass, population density here averages 185.6 persons per square kilometer, the lowest level in the country after Gangwon-do. With a population of 1.47 million, Gwangju is the largest city in the Honam region and the country's fifth-largest city (after Seoul, Busan, Incheon, and Daegu). Gwangju became a city in 1949, a *jikhalsi* (municipality directly subordinate to the national government) in 1986, and most recently, a metropolitan city

Figure 7-1 South Korea's Jeolla region



in 1995.

The Jeolla region is called Korea's grain basket. It contains 31.2 percent of the country's paddy fields and 23.4 percent of its dry fields, and has a higher proportion of cultivated land while it only has about 17.9 percent of the country's forested land. Compared with Jeollabuk-do, Jeollanam-do has more fields, both wet and dry; however, in terms of the percentage of land devoted to paddy fields, Jeollabuk-do has a higher percentage (19.1 percent, as compared with 17.9 percent in Jeollanam-do). More so than Jeollanam-do, Jeollabuk-do is a key area for grain and rice production.

Jeollabuk-do

The province of Jeollabuk-do was created with the splitting of the former province of Jeolla-do into its northern and southern portions in 1896. Its provincial seat is Jeonju and its total population is 1.87 million (3.7 percent of the national population), making it the sixth most populous among the country's nine provinces. Its total land area is 8,066 square kilometers, making it the seventh-largest province in terms of area, and its population density averages 232.2 persons per square kilometer, ranking it the fifth most densely populated of the country's provinces.

In terms of its geological structure, Jeollabuk-do's mountainous eastern region is characterized by a metamorphic series of rock formations, while in the low-lying western regions are found slightly weathered granite series. The heart of the so-called Honam Plains is that lowland area stretching from Gimje to Jeongeup. These

Figure 7-2 Tidelands around Buan-gun, Jeollabuk-do

plains are largely formed by the basins of the Mangyeonggang and Dongjingang Rivers. These rivers experience heavy tidal influence, but more recently, engineering projects have been building up the rivers' estuaries to make the rivers more profitable for irrigation while also straightening the river courses. The tidal flats at the river estuaries and adjacent areas have spread extensively. The expansive plains found in Gwanghwal-myeon in Gimje and Okgu-eup in Gunsan are based on tideland that was reclaimed during the Japanese colonial period.

In the province's mountainous eastern region are found Mt. Deogyusan (1,508 m) in Muju-gun, which sees much winter snowfall and where a ski resort has been built that one can ski down from the mountain's summit, as well as Mt. Naejangsan (765 m) in Jeongeup,

which is a popular seasonal destination for its autumnal foliage. Jinan-gun is formed by a level plateau perched about 400 meters above sea level. In the center of Jinan is Mt. Maisan (686 m), thought to resemble a horse's ear, while in the area's villages one readily spots copses of trees that have been planted to conceal what many consider the unsightly appearance of this "horse ear" mountain.

The differences in terrain between the province's eastern and western portions also translate into climatic variations between the two regions. The western lowlands tend to have higher average temperatures and lesser precipitation than the eastern mountainous region. The mean temperature for Jeonju (in the western area) is −1.2˚C (29.8˚F) for January and 26.3˚C (79.3˚F) for August, while its annual precipitation rate is 1,296 millimeters, slightly higher than the national average. By contrast, in the mountainous eastern region, the mean temperature is −3–4˚C (26.6–39.2˚F) in January and around 24˚C (75.2˚F) in summer, while its annual precipitation averages about 1,354 millimeters. Situated in the coastal area of Gangwon-do's Taebaek Mountain Range, this region receives heavy winter snowfalls.

Agriculture in Jeollabuk-do centers on rice cultivation. In areas such as Gimje, Okgu-eup in Gunsan, and Iksan about 90 percent of the land is dedicated to paddy fields. In terms of dry agriculture, produce varies by region but includes chili peppers, watermelon, peanuts, radishes, cabbage, and ginger, while in Muju-gun and Jinan-gun there is active cultivation of highland vegetables. Although the fishing industry are not especially big, the port of Gunsan does serve as a base for some coastal fishing. Although locales such as Gyeokpo-ri and Gomso-ri in Buan-gun are also important coastal fishing ports, due to the increasing sedimentation of this coast one can say that atrophy is a key feature of the fishing industry here. Until the 1980s, Gomso-ri was renowned for its sea salt and salted fish, though today only the salted fish is still produced.

The locus of the province's industrial development is the Jeonju-Iksan-Gunsan triangle. In terms of output, the light industries such as cosmetics, paper, and tobacco products are more prevalent than the heavy chemical industries. The number of manufacturing enterprises relative to the number of businesses as a whole totals only 2.3 percent in Jeollabuk-do, the third-lowest percentage among the nine provinces, putting Jeollabuk-do ahead only of Gangwon-do (1.4 percent) and Jeju-do (0.4 percent). As a percentage of the province's total workforce, manufacturing workers account for only 2.9 percent, the fourth-lowest figure in the country, with lower numbers found only in Jeollanam-do (2.7 percent), Gangwon-do (1.2 percent), and Jeju-do (0.2 percent). Compare this with the most industrialized province, Gyeonggi-do, where the aforementioned percentages are 33.8 and 30.9, respectively (based on 2011 data).

As of 2014, Jeollabuk-do had six designated cities (Jeonju, Gunsan, Gimje, Iksan, Jeongeup, and Namwon) and eight counties (Wanju-gun, Jinan-gun, Muju-gun, Jangsu-gun, Imsil-gun, Sunchang-gun, Buan-gun, and Gochang-gun). Among these, the most populous is the provincial capital of Jeonju, with 650,000 residents (35 percent of the province's population), while the least populous is the county of Jangsu, with 23,243 (or 1 percent of the provincial population). Besides Jeonju, the city of Iksan has

307,000 (16 percent of the total) and Gunsan 278,000 (15 percent), meaning these three cities together account for nearly 70 percent of the province's population, while the eight counties together make up only a little over 10 percent of the total population of Jeollabuk-do. With the incorporation of Jeonju and Namwon as cities, there is no single county in the province that forms its own independent electoral district. Jinan-gun, Muju-gun, Jangsu-gun, and Imsil-gun combine to form an electoral district; Gochang-gun and Buan-gun form a second; and Wanju-gun and Sunchang-gun form a third.

Traditionally, transportation infrastructure in the Jeolla area has lagged behind that in other regions, but with the completion of the Seohaean (West Coast) Expressway in 2000 and the expansion of the KTX high-speed rail into the region, the transport situation is gradually improving. Because of the region's role as the country's grain basket, railroad lines saw early development here. The Gunsan Line (Gunsan–Iksan) was established in 1912, the Honam Line (Daejeon–Mokpo) in 1914, and the Jeolla Line (Iksan–Yeosu) in 1936.

Some of the province's notable tourist attractions include Mt. Naejangsan, Mt. Seonunsan, and Mt. Deogyusan National Parks, the Jeonju Hanok Village, Mt. Maisan in Jinan-gun, and the Muju Ski Resort. At Jeonju's Hanok Village, the visitor may experience aspects of traditional Korean culture, and many of the town's *hanok* (traditional Korean houses) have been renovated as motels. Easily accessible in the vicinity of the Hanok Village one can also find many sites of historical interest, including Jeondong Cathedral, Korea's oldest cathedral; the Gyeonggijeon Shrine enshrining the

Figure 7-3 Jeonju's Hanok Village, Jeollabuk-do

portrait of King Taejo, founder of the Joseon Dynasty, and its nearby *hyanggyo* (a traditional rural school teaching the Confucian classics); the Jeolla Gamyeong, the traditional office complex for the governor of the Jeolla-do region, and the Omokdae Pavilion, a traditional structure dating back to the early Joseon Dynasty and linked to that dynasty's founder. The city of Jeonju is renowned for its fan craftsmanship and *bibimbap* (a traditional Korean dish of mixed rice and vegetables), while the Jeonju International Film Festival is also adding to its fame.

Jeollanam-do

Like Jeollabuk-do, Jeollanam-do was created in 1896 with the division of what used to be Jeolla-do. Its provincial capital is Muan-gun and its total population is 1.91 million (about 3.7 percent of the national population), ranking it fifth in terms of population among the nation's nine provinces. The province's total area is 12,304 square kilometers (12.3 percent of the national territory), making it the third-largest province in terms of landmass (after Gyeongsangbuk-do and Gangwon-do). Its population density averages 155 persons per square kilometer, making it the third most sparsely populated province (after Gangwon-do and Gyeongsangbuk-do).

The province's geological makeup is largely composed of metamorphic rock and granite belonging to the Mt. Sobaeksan and Mt. Jirisan gneiss complexes as well as Gyeongsang Supergroup rock. In terms of topography, bisected by the Noryeong Mountain Range,

Figure 7-4 Mt. Jirisan and the Seomjingang River

the province has a region of plains to the west of the mountain range and more mountains to its east. Generally speaking, taking the watershed of the province's Seomjingang and Yeongsangang Rivers (i.e., the so-called Honam Jeongmaek) as a border, one finds higher elevations to the east than to the west. High peaks in the province's eastern portion include Mt. Baegunsan (1,218 m) in Gwangyang, Mt. Jogyesan (884 m) in Seungju-eup in Suncheon, and Mt. Jeamsan (779 m) in Boseong-gun. At the eastern edge of this region one finds Gurye's Mt. Jirisan (1,915 m). The Seomjingang River, which has its origins in Gurye-gun, goes on to form the frontier between the Jeolla and Gyeongsang regions. The Yeongsangang River, which originates in Damyang-gun, is smaller than the Seomjingang River, but it is counted as one of the country's four major rivers, the others being the Hangang, Nakdonggang, and Geumgang Rivers.

The coastal region of Jeollanam-do is extremely irregular and has myriads of inlets and small coastal islands. The southern coast of this region enjoys international renown as an example of a ria coast formation. Unique to Jeollanam-do are its more than two thousand coastal islands, both inhabited and uninhabited. Of the region's many bays and inlets, the only ones of significant size are the Hampyeongman, Yeongamman, Gangjinman, and Boseongman Bays. The coastal region has expansive tidelands, the area has long been the locus of tideland reclamation work, and many islands have been connected to the mainland by bridge.

The Jeollanam-do region enjoys a milder climate than the country's central regions, with an annual mean temperature of around 12°C (53.6°F), 25°C (77°F) in August, and −3–1°C

(26.6–33.8°F) in January. The mean January temperatures for the southern coastal region stretching from Mokpo to Yeosu through Haenam-gun, Wando-gun, Jangheung-gun, and Goheung-gun typically do not drop below freezing. The average precipitation rate for Jeollanam-do is higher than the national average. The province's southern coastal region can exceed 1,500 millimeters annually, with the inland region receiving about 1,300 millimeters. The heavy rainfall of the southern coastal region can be attributed to the Honam Jeongmaek range of mountains, which extends parallel to the coast and acts to trap the clouds coming in from the South Sea. As these clouds then traverse the Honam Jeongmaek, they release their precipitation over the region. Because of the region's milder winters, onions and cabbage can be grown as winter crops and the region is lush in temperate evergreen forest. Typical evergreen broad-leaved trees found here are the magnolia, camellia, and castanopsis, while the Chungnyeongsan Natural Recreational Forest in Jangseong-gun is famed for its cypress trees.

Jeollanam-do has some 2,077 square kilometers under paddy cultivation (16.8 percent of its land area), the highest rate in the country, while it has some 1,171 square kilometers under dry field cultivation, the second-highest rate after Gyeongsangbuk-do. The rates of wet paddy field agriculture are high in places like Naju, Hampyeong-gun, Damyang-gun, and Jangseong-gun in the basin of the Yeongsangang River as well as in coastal areas like Yeongam-gun, Gangjin-gun, Jangheung-gun, Boseong-gun, and Gwangyang. Besides rice, important crops for Jeollanam-do include barley and sweet potatoes, while radishes, cabbages, watermelons, garlic, and onions are also widely cultivated. In terms of fruit, the pears of Naju are highly prized.

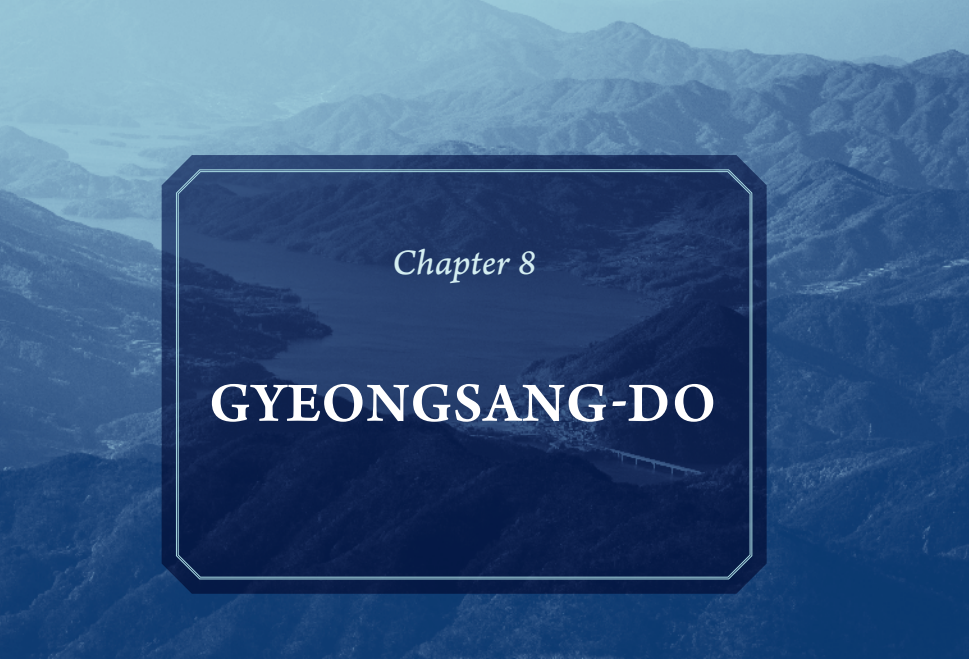
Though due to its extended coastline and numerous offshore islands the province's fishery industry is well developed, the proportion of aquacultural enterprises, such as the cultivation of laver, sea mustard, oysters, and abalone, is increasing. Jeollanam-do has hundreds of fishing ports both large and small. In terms of fish species, important catches are croakers, hairtails, mullets, anchovies, shrimps; and mollusks such as oysters, pen shells, and octopuses. The region's large ports include Mokpo, Yeosu, Wando-gun, and Beopseongpo, whereas some smaller but very pictueresque ports include Nokdong in Goheung-gun, Yulpo in Boseong-gun, Maryang in Gangjin-gun, and Yerihang on Heuksando Island. Worth noting especially is Beopseongpo in Yeonggwang-gun, the nation's largest producer of *gulbi*, dried yellow croaker, which is distributed nationwide and exported abroad. Most industry in the province is concentrated in the areas of Gwangju, Yeocheon, Donggwangyang, Mokpo, and Yeosu. Gwangju has a variety of industries, while Yeocheon has a developed petrochemical industry, Donggwangyang has a ferrous metallurgy industry, Mokpo has fisheries, and Yeosu is home to major industries such as shipbuilding.

As of 2014 Jeollanam-do had five designated cities (Naju, Suncheon, Gwangyang, Yeosu, and Mokpo), seventeen counties (Yeonggwang-gun, Jangseong-gun, Damyang-gun, Gokseong-gun, Gurye-gun, Hwasun-gun, Hampyeong-gun, Muan-gun, Sinan-gun, Yeongam-gun, Jindo-gun, Haenam-gun, Wando-gun, Gangjin-gun, Jangheung-gun, Boseong-gun, and Goheung-gun). Of these, the

most populous is the city of Yeosu (290,000, or 15.2 percent of the province's total population). This is followed by Suncheon with 270,000, Mokpo with 240,000, and Naju with 90,000. All the counties have populations between 20,000 and 80,000, with the most populous being Haenam-gun with 78,000 and the least populous being Gurye-gun with 27,000.

Mokpo is the oldest of the province's cities, having emerged out of the laying of the Honam Railway Line during the Japanese colonial period (1910–1945). Following this came the development of other railway lines, such as the Jeolla Line between Iksan and Yeosu and the Gyeongjeon Line between Gwangju and Busan. With the completion of highway networks in the province, such as the Honam Expressway, the Seohaean (West Coast) Expressway, the 88 Olympic Expressway, the Namhae Expressway, the Muan–Gwangju Expressway, the Iksan–Pohang Expressway, and the Gwangju–Wonju Expressway, the province's poor transportation situation became a thing of the past.

Jeolla-do has numerous well-known places, products, and events: Yeosu's Jinnamgwan Hall (the former headquarters of the navy during the Joseon Dynasty), Odongdo Island, and Manseong-ri Beach; Dadohaehaesang National Park; Songgwangsa Temple in Suncheon; the tea plantations and green tea of Boseong-gun; Yeongam-gun's Wolchulsan National Park and Formula 1 racing circuit; Wando-gun's Cheonghaejin Garrison (a naval base dating back to the ancient Silla Dynasty); Mokpo's Mt. Yudalsan and its modern urban landscape; the islands of Hongdo and Heuksando; the city of Gwangju, birthplace of the nation's Minju (grassroots democracy) movement, and its Geumnam-ro street (where the May 18, 1980, protest against authoritarian rule began) and May 18 Memorial Park. Jeollanam-do is also well known in Korea as the nation's gastronomic capital, being notable especially for its *baekban* (a meal characterized by a plethora of small side dishes) and *hanjeongsik* (traditional Korean meal, also with many side dishes) menus, which are more elaborate than in any other part of the country and often include dozens of side dishes, including many items that are known throughout the country as regional specialities, including live octopus, *gulbi* (dried yellow croaker), salted fish, *chueotang* (a stew of loach fish and soybean paste), *hongeo* (fermented skate fish), croaker fish, green tea, *gat kimchi* (pickled mustard stems), and *bulgogi* (marinated and grilled beef).



Chapter 8

GYEONGSANG-DO

The name "Gyeongsang" was coined in the early fifteenth century as a combination of the names of the region's two largest cities, Gyeongju and Sangju. As the former capital of the ancient Korean kingdom of Silla (ca. 57 BCE–935 CE), Gyeongju was in effect the national capital for a millennium. Sangju served until the sixteenth century as the headquarters (or *gamyeong*) of the provincial governor of what was then Gyeongsang-do. This region of the country is also called the Yeongnam region, meaning "south of the passes." Here the "passes" (*yeong*) are understood to refer to the mountain passes of Joryeong Pass (548 m) and Jungnyeong Pass (689 m).

As of 2013, the population of the entire Gyeongsang region (encompassing the provinces Gyeongsangbuk-do and Gyeongsangnam-do) was 6.03 million (or 11.8 percent of the national population), making it the most populous region after Gyeonggi-do.

Its total land area is 29,566 square kilometers (29.5 percent of the total national territory), making it the country's largest region and some sixteen times larger than the country's smallest province (Jeju-do, which measures 1,849 square kilometers). Having a large population but also a large territory, the population density of the region averages 204 persons per square kilometer—higher than the corresponding figures for Gangwon-do and the Jeolla region, but lower than those for Gyeonggi-do, Jeju-do, and the Chungcheong region.

The Gyeongsang region can largely be divided into the basin region of the Nakdonggang River and the East Sea coastal region; however, the largest portion of the region consists of the basin of a

Figure 8-1 South Korea's Gyeongsang region

single river. What's more, the basin region of the Nakdonggang River is hemmed in by the Taebaek and Sobaek Mountain Ranges, Korea's most rugged mountain chain, effectively making the Gyeongsang region one giant basin and cutting it off from easy communication with the outside. During the late Joseon Dynasty especially, the former province, linked internally by river transport along the Nakdonggang River, was able to maintain a quasi-independent existence from the outside world. For this reason, the region is home to more distinctive cultural characteristics and has a stronger feeling of shared language, culture, and history than the Gangwon, Gyeonggi, Chungcheong, or Jeolla regions.

Gyeongsangbuk-do

Gyeongsangbuk-do was formed in 1896 when the former province known as Gyeongsang-do was split into its northern and southern portions. Since the early seventeenth century the provincial capital had been Daegu, but recently an area on the border between Andong and Yecheon-gun has been designated the site for the new provincial seat and preparations are ongoing for the transfer. The population of Gyeongsangbuk-do is 2.7 million (about 5.3 percent of the national population), making the province the third biggest in terms of population (after Gyeonggi-do and Gyeongsangnam-do). Daegu Metropolitan City, which is administratively separate from the province, has a population of 2.5 million (4.9 percent of the national population) and is the nation's fourth-most-populous city, having only recently been surpassed by Incheon. The total land area

of Gyeongsangbuk-do is about 19,000 square kilometers, or 19 percent of the total national territory, making it territorially the largest of the country's nine provinces. In terms of population density, Gyeongsangbuk-do is second from last with 142 persons per square kilometer—the last being Gangwon-do, which has only 92 persons per square kilometer.

In terms of its geology and topography, the entire Yeongnam region is rather distinct from neighboring regions. Generally speaking, sedimentary rock series from the Gyeongsang Supergroup and igneous rock series from Daebo granitoids predominate, though in the Pohang area the Cenozoic Tertiary period Homi Peninsula has volcanic igneous rocks from the Quaternary period. The Sobaek Mountain Range splits off in a southwesterly direction from Mt. Taebaeksan (1,546 m); while the Taebaek Mountain Range continues in a southerly direction all the way to the Busan area.

Peaks of the Sobaek Mountain Range surpassing 1,000 meters in altitude include Mt. Sobaeksan (1,440 m), Yeonhwabong Peak (1,394 m), Munsubong Peak (1,162 m), Mt. Juheulsan (1,106 m), and Mt. Songnisan (1,058 m), while the Mt. Gayasan ridgeline, which diverges in a southeasterly direction out of Mt. Daedeoksan, has a number of peaks exceeding 1,300 meters. Major passes of the Sobaek Mountain Range that link the region with the neighboring Chungcheong provinces are Jungnyeong Pass (689 m), Ihwaryeong Pass (548 m), and Chupungnyeong Pass (200 m).

On the other hand, as the Taebaek Mountain Range moves into the Gyeongsang region from Gangwon-do, its elevations diminish. In the area between Yeongcheon and Gyeongju in Gyeongsangbuk-do,

the range's watershed is only a bit over 100 meters in elevation. But as the range moves further south it ascends once more, and in the border region between Gyeongsangbuk-do and Gyeongsangnam-do one again finds peaks that surpass 1,000 meters in altitude. Up until the 1960s, the Nakdonggang River's importance as an inland maritime highway exceeded that of other large rivers. Among the province's major rivers flowing into the East Sea, the largest is the Hyeongsangang River, which flows through the city of Gyeongju, whose basin totals some 1,167 square kilometers in area.

The annual mean temperature of Gyeongsangbuk-do is in the range of 11–13˚C (51.8–55.4˚F). For August, the highest mean temperatures are in Daegu (26–27˚C/78.8–80.6˚F), and the lowest in Uljin-gun and on Ulleungdo Island (24˚C/75.2˚F). For January, the inland mountain regions average about −3.5˚C (25.7˚F) while the province's eastern coastal regions average just above freezing. The inland regions of Gyeongsangbuk-do see little in terms of precipitation. Average annual precipitation in Yeongcheon, Chilgok-gun, Uiseong-gun, Seonsan-eup in Gumi, and Daegu does not surpass 1,000 millimeters; combined with the region's high temperatures, this makes for some of the most unbearable summers on the peninsula.

Gyeongsangbuk-do, like Jeollanam-do, has a significant amount of arable land, but because of the province's vast mountainous regions the percentage of land under cultivation has never been very high, only about 16 percent. With the rapid aging of the rural population, the area's farming population is dropping and with it the amount of cultivated land. Though it is second only to Jeollanam-do in terms of the area that its paddy fields cover, Gyeongsangbuk-do not only lags

behind Jeollanam-do in terms of rice production but even behind Jeollabuk-do and Chungcheongnam-do. Presumably, the many paddy fields found in the more mountainous regions are demanding to maintain, notably with respect to irrigation.

Among dry field produce, the province is one of the country's leading growers of hulled barley, sesame, chili peppers, apples, grapes, and peaches. Besides these, tobacco is an important crop in Cheongsong-gun and Yeongyang-gun, watermelon and Korean melon (*chamoe*) in Seongju-gun, and garlic in Uiseong-gun. The fishing industry is not widely developed in the province, although between Uljin-gun and Pohang one finds many beautiful inlets at places like Jukbyeon, Hupo, Ganggu, Guryongpo, and Gampo. As far as mineral resources, the city of Mungyeong was once an important coal producer but most of the former mining landscape is now being transformed into tourism facilities. And in terms of industry, the area was traditionally important for its textiles but since the 1970s, with the development of Pohang as a steel manufacturing center, the surrounding area has also undergone a transformation into industrial parks producing steel products, auto parts, farm machinery, electronics, and metals.

Gyeongsangbuk-do has ten cities (Pohang, Gyeongju, Gimcheon, Andong, Gumi, Yeongju, Yeongcheon, Sangju, Mungyeong, and Gyeongsan) and thirteen counties (Gunwi-gun, Uiseong-gun, Cheongsong-gun, Yeongyang-gun, Yeongdeok-gun, Cheongdo-gun, Goryeong-gun, Seongju-gun, Chilgok-gun, Yecheon-gun, Bonghwa-gun, Uljin-gun, and Ulleung-gun). Among these, the most populous is the city of Pohang (520,000, or 19.2 percent of the provin-

cial population), followed by Gumi (420,000, 15.5 percent), Gyeongju (260,000, 9.8 percent), and Gyeongsan (250,000, 9.2 percent).

Gyeongsangbuk-do is full of tourist sites attracting both domestic and international visitors. These include the Andong area's Andong Folk Museum, Andong Soju Museum, Hahoe Village, Andong Hahoe Village Mask Dance Drama Training Center, and Dosanseowon Confucian Academy; the Daegu area's Yangnyeongsi Oriental Medicine Cultural Center, Dalseong Park, oriental medicine market, Dongseongno Street (a major fashion area), and Palgongsan Provincial Park (the site of Gatbawi, a boulder named for its resemblance to a traditional Korean hat); the Gyeongju region's Bulguksa Temple, Bomun Tourist Complex, Wolseong Park, Cheomseongdae (an ancient observatory), Anapji Pond, Banwolseong Fortress, Gyeongju National Park, Seokguram Grotto, Hwangnyongsa Temple Site, Mt. Namsan, Oreung Royal Tombs, Underwater Tomb of King Munmu, Oksanseowon Confucian Academy, Gameunsa Temple, Yangdong Village, and Tongdosa Temple; and not least the scenic beauty of Ulleungdo Island. Like Jejudo Island, Ulleungdo Island

Figure 8-2 Andong's Hahoe Village (left), Ulleungdo Island's Cheonbu Harbor, Gyeongsangbuk-do (right)

was formed by volcanic activity and so its landscape is particularly striking. Indeed, the entire island is scenic enough as to constitute a natural monument, and it offers some of the country's most pristine and outstanding natural beauty.

Gyeongsangnam-do

When the province was created in 1896, Gyeongsangnam-do's capital was Jinju, but Busan became the capital in 1925. In 1983 the provincial seat was moved to Changwon, the first transfer of a provincial capital since the foundation of the Republic of Korea in 1948. In 1948, Busan, Masan, and Jinju were all designated cities. Busan was elevated to the status of *jikhalsi*, a municipality directly under the administration of the central government, and in 1995 attained its current status as Busan Metropolitan City. Ulsan was named a city in 1962, and in 1997 it too became administratively separate from the province when it was named Ulsan Metropolitan City.

The population of Gyeongsangnam-do is 3.33 million (about 6.5 percent of the national population), making it the country's second-most-populous province. This figure does not include the metropolitan cities Busan (population 3.5 million) or Ulsan (population 1.16 million). The combined figure for the Gyeongsangnam-do region, including Busan and Ulsan, is about 7.99 million (16 percent of the national total), making it the second-most-populous region, trailing only the capital region. The province's total land area is 10,537 square kilometers, making it the fourth-largest province in terms of area, while its population density averages 316 persons

per square kilometer, making it the third most densely populated province (after Gyeonggi-do and Jeju-do).

The entire Gyeongsangnam-do region forms part of the Gyeongsang Basin, and its geological makeup is similar to that of Gyeongsangbuk-do. Peaks such as Mt. Namdeogyusan (1,508 m), Mt. Baegunsan (1,279 m), and Mt. Jirisan (1,915 m) form part of the Sobaek Mountain Range, while peaks such as Mt. Sudosan (1,317 m) and Mt. Gayasan (1,430 m) are located along the border with Gyeongsangbuk-do, and peaks like Mt. Unmunsan (1,188 m) and Mt. Jaeyaksan (1,108 m) are situated in the province's northeast and form part of the border with Gyeongsangbuk-do. Though the Taebaek Mountain Range extends as far as Mt. Geumjeongsan (892 m) in Busan, its ridgeline in Gyeongsangnam-do is not very pronounced. The main passes between the Yeongnam (i.e., Gyeongsang) and neighboring Honam (i.e., Jeolla) regions are Yuksimnyeong Pass (734 m), which sits between Hamyang-gun and Jinan-gun, and Pallyangchi (513 m), between Hamyang-gun and Namwon.

The Nakdonggang River originates in Taebaek and flows through Gyeongsangbuk-do and Gyeongsangnam-do with its major tributaries including the Hwanggang, Namgang, and Miryanggang Rivers. The alluvial plains of the Nakdonggang River and its tributaries, as well as the mouth of the Nakdonggang River, form the primary plains of Gyeongsangnam-do. The Namgang River constitutes about 15 percent of the Nakdonggang River system's total area and has a very large discharge. In areas abutting the coastal region, peaks never reach more than 500–700 meters in altitude. The coast consists of highly irregular ria formations and the nearby Geojedo Island (375 square kilometers) is the country's second-largest island (after Jejudo Island). The province's Namhaedo Island (301 square kilometers) is the fifth-largest island in South Korea—the third- and fourth-largest being Jindo Island in Jeollanam-do (375 square kilometers) and Ganghwado Island in Incheon (303 square kilometers).

Due to maritime influences, the annual mean temperature in this region is a relatively high 12–14° (53.6–57.2°F). The January mean temperatures for Busan and Tongyeong are 2.2°C (35.9°F) and 2.3°C (36.1°F), respectively, while the rest of the coastal region for January has mean temperatures that are still above freezing. Thus the province's western coastal region constitutes a warm temperate forest zone with such species as camellia, magnolia, and the trifoliate orange tree. Though temperatures are relatively high here, precipitation levels are also high. In the province's Namhaedo Island and Geojedo Island, annual rainfall can exceed 1,700 millimeters, making them, along with Jejudo Island, the country's wettest areas.

The percentage of cultivated land in Gyeongsangnam-do, around 18 percent, is lower than the national average. Wet fields under cultivation in the province outnumber dry fields two to one. In terms of the types of crops cultivated there, rice is the most common followed by barley. There are also large markets for the region's vegetables and flowers in the nearby cities of Busan, Ulsan, and Daegu. Though administratively it is not part of Gyeongsangnam-do, Busan is home to the region's most developed fisheries industry. If Busan is included, therefore, the Gyeongsangnam-do region accounts for about half of the accumulated catch of the country's fishing industry, with the major species being mackerel, anchovy, sardine, flounder, Spanish

mackerel, croaker, Japanese amberjack, and filefish. The province has the second-largest number of fishing ports (after Jeollanam-do), with major representative ports being Busan's Dadaepo, Ulsan's Bangeojin, Geoje's Oepo, Goseong's Maekjeonpo, and Namhae's Mulgeon-ri.

Turning to mineral resources, an important one for the region is kaolin. With deposits found primarily in the province's western region, kaolin is a key ingredient in the ceramics industries of cities such as Jinju and Miryang.

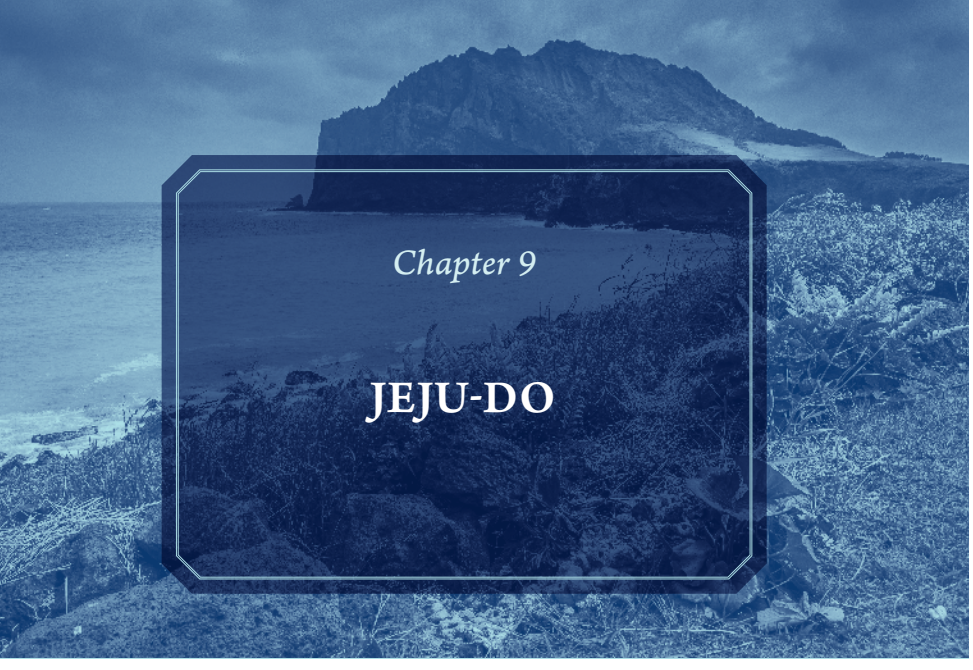
The 1960s saw the development of a petrochemical industrial complex in Ulsan, after which the industry continued to develop in the coastal region of the province. The so-called Southeastern Coastal Industrial Zone is a belt stretching from Pohang, along the coast of Gyeongsangnam-do as far as the area of Gwangyang-Yeocheon in Jeollanam-do, and with the city of Busan as its core. Key industries in this manufacturing belt include machinery, textiles, and shipbuilding in Busan; petrochemicals, automobiles, and shipbuilding in Ulsan; machinery in Changwon; textiles and machinery in Masan; shipbuilding in Geoje; and fisheries and processing in Tongyeong and Sacheon.

Gyeongsangnam-do comprises eight cities (Changwon, Jinju, Tongyeong, Sacheon, Gimhae, Miryang, Geoje, and Yangsan) and ten counties (Uiryeong-gun, Haman-gun, Changnyeong-gun, Goseong-gun, Namhae-gun, Hadong-gun, Sancheong-gun, Hamyang-gun, Geochang-gun, and Hapcheon-gun). In 2010, the cities of Masan and Jinhae merged with Changwon, making Changwon the largest city with a populace of more than 1.1 million, followed by Gimhae with 530,000 and Jinju with 340,000. The least

populous administrative unit is Uiryeong-gun with only 14,000 residents, while the most populous county is Haman-gun with 70,000.

Because it is located along the Seoul–Busan route, Gyeongsangnam-do underwent development very early. Because the laying of railroads and the construction of highways were essential to its development, the region's transportation infrastructure is excellent. During the summer holidays, Busan's Haeundae Beach can see upwards of a million visitors a day.

Busan is second only to Seoul in terms of attracting international visitors. Some well-known attractions in Busan include Yongdusan Park, Nampo-dong, the Jagalchi fish market, Yeongdo Island, Haeundae Beach, the Busan Museum, Beomeosa Temple, and Geumjeongsanseong Fortress. The areas around the city's Pusan National University, Kyungsung University, and Haeundae Beach, as well as the commercial neighborhoods of Gwangalli and Seomyeon, are known for their constant activity and as areas that never sleep. The province's southern coastal region also has its share of visitor attractions, including Geojedo Island's Korean War prisoner-of-war camp, Gohyeon-ri, Jangseungpo, Tongyeong, Haegeumgang, Oedo Island, Namhaedo Island, Jinju's Chokseongnu Pavilion, and Jirisan National Park (the country's first national park to be designated among Korea's twenty-one national parks) along with its Ssanggyesa Temple and Dullegil Trail.



Chapter 9

JEJU-DO

Jeju-do traditionally formed part of Jeollanam-do, but broke away in 1946; in 2006, it was designated the country's only "self-governing province." In traditional times, the island had three primary cities—Jeju, Daejeong, and Jeongui—but today its two main cities are Jeju City on its northern coast and Seogwipo on its southern coast.

As of 2013, the population of Jeju-do was 594,000, making it the least populous of the nation's nine provinces with about 1.2 percent of the national population. The island spans about 31 kilometers from north to south and 73 kilometers from east to west, covering a total area of 1,849 square kilometers—about three times the area of Seoul. Its population density averages 321 persons per square kilometer, making it the second most densely populated of the nation's nine provinces (Gyeonggi-do being the first).

Geologically, Jejudo Island is a volcanic island formed between the Pliocene epoch at the end of the Cenozoic Tertiary period and the Pleistocene epoch in the Quaternary period. The island's upper surface is composed primarily of basalt with very high permeability, and the island lacks permanently flowing rivers or streams. For this reason, most settlements formed along the island's coast, clustered around natural springs called *yongcheondae*.

In Jeju-do's center towers Mt. Hallasan (1,950 m), the highest peak in South Korea. Throughout the island one also finds *oreum*, smaller parallel volcanoes that formed through volcanic activity after rift activity on the island had come to an end. The majority of these *oreum* are only about 100 meters tall, but there are taller ones such as Mt. Sanbangsan (395 m) and Seongsan Ilchulbong Peak (also known as Sunrise Peak; 182 m) whose natural beauty has made them popular tourist sites. Although these *oreum* are scattered along the ridge of Mt. Hallasan from east to west, they are more

Figure 9-1 South Korea's Jeju Self-Governing Province

prevalent in the island's eastern section, while the coastal areas in both the east and west have relatively expansive lowland plains. On the western side of the island, the township of Hangyeong-myeon is the island's largest farming region. At altitudes of 200–500 meters above sea level, the terrain here is hilly or mountainous.

Jeju-do has some of the most exotic and singular landscapes within Korea. Prior to South Korea's liberalization of overseas travel restrictions in the early 1990s, the island was the primary destination for honeymooning Korean couples. Its primary draw is its volcanic landscapes, providing remarkable scenery one cannot find on the Korean mainland. More intriguing still for Korean visitors is the island's lack of rice paddies, so ubiquitous on the mainland. Though rice paddies are not completely absent from Jeju-do, visitors rarely encounter them because rice farming on the island is a small-scale business that has been gradually declining.

Jeju-do sits about 90 kilometers (56 miles) south of the Korean Peninsula's southern tip, so its climate is also quite different from that of the mainland, with higher mean temperatures as well as higher precipitation levels. The mean temperature for August is 26.6°C (79.8°F) in Jeju City and 26.7°C (80°F) in Seogwipo, similar to the mainland; however, the island's January mean temperatures of 5.2°C (41.4°F) for Jeju City and 6.0°C (42.8°F) for Seogwipo are about 10°C (20°F) higher than temperatures in Seoul. Nevertheless, the island's frigid sea breezes can make those temperatures seem lower than they are. Though Jejudo Island is known for its year-round winds, the winter northwest monsoon can be particularly harsh.

Reflecting its relatively warm climate, the areas throughout the island that sit no more than 600 meters above sea level constitute a warm temperate forest zone with such tree species as *Machilus thunbergii,* a species of evergreen shrub; *Cinnamomum camphora,* or camphor; and *Neolitsea sericea,* a medium-sized evergreen tree. Between 600 and 1,500 meters above sea level, the land on Jejudo Island constitutes a cool temperate forest zone with *Acer palmatum* (maple), *Pinus densiflora* (Japanese red pine), *Styrax japonicus* (Japanese snowbell), and the *Quercus serrata* (Bao Li). Above this altitude, one finds coniferous forest with such species as *Abies koreana* (Korean fir), *Taxus cuspidata* (spreading yew), and *Betula ermanii* (birch). Finally, at altitudes exceeding 1,700 meters, there is a shrub zone with species such as *Salix hallaisanensis* (Hallasan willow), *Juniperus* chinensis (dwarf juniper), and the *Rhododendron mucronulatum* (Korean rosebay). Thus on Mt. Hallasan alone one can find species belonging to the warm temperate forest zone all the way up to the freezing forest zone. From the end of the Goryeo Dynasty (918–1392), the island's mountainous area saw the creation of artificial grasslands, which then became plantations for either animal husbandry or citrus orchards. The island's Isidore Ranch is famed as a ranch and farm developed by missionaries.

The island's isolation, inaccessible as it is by both land and sea, has contributed greatly to the development of its unique culture. Like the foundation myths of many other cultures, that of the Korean nation has the founder, Dangun, descending from the heavens. In contrast, the foundation myth of Jejudo Island relates how the island's three progenitors—Go (高), Yang (梁), and Bu (夫)—emerged from the earth at Samseonghyeol (literally "three clans'

holes"). Even today one finds *bonhyangdang*, native shrines to village deities called *bonhyang*, distributed throughout the island, and village rituals take place there. It is believed that after such rituals are performed, the spirits go back into the ground. Though these rituals are carried out to benefit the village's safety and welfare, they are not communal undertakings, but rather are prepared and performed at the familial level, another aspect of Jejudo Island culture not seen on the Korean mainland. Such unique cultural features have been attributed to the prevalence of islanders' interchanges with other cultures over those with the Korean mainland. In the island's culture one can discern affinities with cultural features found on Okinawa in Japan, in China's Fujian Province, in Taiwan, and even as far away as Southeast Asia and the South Pacific. Indeed, even the indigenous language of Jejudo Island is quite different from that of the Korean mainland, such that it can be impossible for outsiders to communicate with the island's native elderly population. This phenomenon is analogous to the situation between the Okinawan language and Japanese. Even households where the parents, children, and children-in-law live under the same roof, it's not uncommon for each generation to have its own separate kitchen and prepare its own meals. Another distinguishing cultural feature is the greater participation of women in the province's labor force compared with the Korean mainland. One additional factor in the gradual distancing of the island's culture from that of the Korean mainland is that the sea effectively insulated Jejudo Island from the strong Confucianization of Korea over the course of the Joseon Dynasty (1392–1910).

Not surprisingly, contemporary Jeju-do's primary industry has

been tourism. In terms of agriculture, the cultivation of fruits such as the tangerine, the so-called *hallabong* (also known as the *dekopon*, a citrus hybrid), and the *Daphne odora* (a flowering shrub), is very important, while sweet potatoes, potatoes, rape, garlic, and carrots are also important crops. The raising of racehorses in the island's pasturage is also a key industry. And in terms of fisheries, primary catches include cutlasses, sea breams, anchovies, squids, and the Japanese amberjacks, while the sale of sea products such as abalones, conches, sea cucumbers, and sea squirts gathered by the island's female divers called *haenyeo* ("sea women") are an important source of tourist revenue. The work of these *haenyeo* is very arduous and can result in such occupational hazards as decompression sickness. Such conditions are treated using traditional methods.

In 2012, Jejudo Island gained recognition as one of the world's New Seven Wonders of Nature, joining the ranks of Vietnam's Halong Bay, the Philippines' Puerto-Princesa Subterranean River National Park, Brazil's Amazon Rainforest, Argentina's Iguazú Falls, Indonesia's Komodo Island National Park, and South Africa's Table Mountain National Park. In 2013, the number of visitors to Jeju-do surpassed 10.85 million, producing tourism revenue of KRW 6.5 trillion (US$6.5 billion). In 2012, of the island's 1.7 million international tourists, 1.08 million, or 64 percent, were from China. The number of Chinese visitors is expected to increase rapidly, and a new complex is being built to accommodate them.

Jeju-do is steadily expanding its tourist attractions to include such things as museums, water sports, submarine rides, and horseback riding. Visitor destinations in the vicinity of the island's Jeju City in-

Figure 9-2 Seongsan Ilchulbong Peak (Sunrise Peak), Jeju Self-Governing Province

clude Samseonghyeol, the Jeju National Museum, the Jeju Folklore and Natural History Museum, the Jeju Harbor, the Jejueupseong Walled Town (also the site of the former governor's office, or Gwana), Mokseogwon Park, and Jeju Loveland. The eastern part of the island is playing up its shoreline scenery, Udo Island, Manjanggul Cave, Bijarim Forest, the coast at Geumnyeong, the Sangumburi Crater, Seongeup Folk Village, and Seongsan Ilchulbong (Sunrise Peak). In the vicinity of Seogwipo on the southern coast one can find Jeongbang, Cheonjiyeon, Cheonjeyeon Falls, the Leejungseop Art Museum, Oedolgae Rock, the Jungmun Tourism Complex, Yeomiji Botanical Gardens, Yakcheonsa Temple, and the Daepo Jusangjeolli Cliff. To the west, there is Mt. Sanbangsan, Hwasuncheung, the coast at Yongmeo-ri, Marado Island, Moseulpo Harbor, Kim

Figure 9-3 Yongmeo-ri, Jeju Self-Governing Province

Jeong-hui's place of exile (and the Daejeong-eup town wall), Jeju Sculpture Park, Bunjae Artpia Museum, the Peace Museum, Hallim Park, beaches at Hyeopjae, and Biyangdo Island, as well as many other "chimneyless" industries—that is, parts of the tourism industry—that can be found in Hallasan National Park and elsewhere throughout the island.

Chapter 10

NORTH KOREA

The official name of North Korea is the Democratic People's Republic of Korea. It was established as a socialist country on September 9, 1948, with its capital at Pyongyang (Pyeongyang under South Korea's revised romanization system). While the South Korean constitution defines the entire peninsula as South Korean territory, North Korea likewise lays claim to the entire peninsula. In terms of area, North Korea's territory covers 123,000 square kilometers, a little bit more than that of South Korea. According to the *CIA World Factbook*, as of July 2012, the population of North Korea was 24.6 million and its average population density was 200 persons per square kilometer. The majority of its population is concentrated in the western plains and eastern coastal region.

North Korea shares a 250-kilometer (155-mile) border with South Korea called the Military Demarcation Line, while to the north its territory borders China along the Amnokgang (or Yalu) River and Russia along the Dumangang (or Tumen) River. Mountain ranges extend eastward from Mt. Baekdusan (Paekdusan) along the Chinese border nearly to the coast; while mountains also extend across the country's western region to the sea, with the exception of river basins and coastal areas. North Korea's major cities are situated along the Amnokgang (Yalu), Cheongcheongang

Figure 10-1 North Korea (Democratic People's Republic of Korea)
Source: The National Atlas of Korea I, 2015

(Chongchongang), Daedonggang, and Yeseonggang Rivers and along its coast.

The North Korean capital, Pyongyang, is situated along the Daedonggang River, much like the South Korean capital of Seoul is situated along the Hangang River. And just as Incheon at the mouth of the Hangang River serves as the gateway to Seoul, so does Jinnampo (Chinnampo) at the mouth of the Daedonggang River serve as the gateway to Pyongyang. In terms of administrative divisions, North Korea is divided into Pyongyang Directly Governed City (Pyongyang Jikhalsi), Raseon (Rason) Special City, Nampo Special City, and the provinces of Pyeongannam-do (Pyongannam-do), Pyeonganbuk-do (Pyonganbuk-do), Hamgyeongnam-do (Hamgyongnam-do), Hamgyeongbuk-do (Hamgyongbuk-do), Hwanghaenam-do, Hwanghaebuk-do, Jagang-do (Chagang-do), Yanggang-do (Ryanggang-do), Gangwon-do (Kangwon-do), the Sinuiji Special Administrative Region, the Mt. Geumgangsan (Kumgangsan) Tourist Region, and the Gaeseong (Kaesong) Industrial District. The province of Jagang-do was formed in 1949 through an amalgamation of the eastern portions of Pyeonganbuk-do as well as portions of Pyeongannam-do, while Yanggang-do was formed in 1954 through the reorganization of portions of Hamgyeongnam-do and Hamgyeongbuk-do, in this way ensuring that North Korea could have nine provinces just as South Korea did. Both North and South Korea have provinces called Gangwon-do (spelled Kangwon-do in North Korea), with the North Korean province having Wonsan as its capital.

Following the Korean War (1950–1953), Kim Il-sung consolidated his dictatorial rule in North Korea and in 1977 introduced *juche* as the official state ideology. The aim of this initiative was to consolidate the power of the North Korean leadership, and it was also a response to the Yusin "restoration," which ushered in a military dictatorship in South Korea. Following the death of Kim Il-sung in 1994, his son Kim Jong-il assumed the leadership in a hereditary transfer of power. In 2000, General Secretary Kim Jong-il and South Korean President Kim Dae-jung announced the first leaders' summit between the two states since the 1945 division, a summit that resulted in the June 15 North-South Joint Declaration. During his lifetime, Kim Il-sung had never met with President Rhee Syngman, much less with President Park Chung-hee. Following this first summit, the two Koreas began to pursue common industrial and commercial projects such as the development of tourism initiatives at Mt. Geumgangsan and the creation of the Gaeseong Industrial Complex. However, since the Lee Myung-bak administration in South Korea (2008–2013) and the election of President Park Geun-hye, North–South relations have become frigid. Upon North Korean leader Kim Jong-il's death in 2011 there was once more a transfer of power, this time to his son Kim Jong-un, making North Korea the only post-twentieth-century "republic" with a hereditary system of succession.

Korea is the world's last remaining divided nation. In a gesture toward reunification, both countries simultaneously joined the United Nations, and the two sides have come together several times at multilateral negotiations. The administration of South Korean President Kim Dae-jung (1998–2003) in particular stressed its "Sunshine Policy" of engagement with the North, making efforts to

ease inter-Korean tensions and foster reform and opening in North Korea. For his achievements in this area, Kim was awarded the Nobel Peace Prize.

Pyongyang has many attractions for the visitor, including the Kumsusan Memorial Palace, built in commemoration of the sixty-fifth birthday of then–North Korean leader Kim Il-sung in 1977; performances by the Mansudae Art Troupe; Moranbong Hill; Juche Tower; the Pyongyang subway system; and the Arirang Mass Games. As South Korean citizenship is not recognized in the North, South Koreans cannot visit that country, but those with other nationalities can easily arrange to visit.

Pyongyang served as the capital of the ancient Korean kingdom of Goguryeo (ca. 37 BCE–668), while the city of Gaeseong was important as the capital of the Goryeo Dynasty (935–1392). Up through the Japanese colonial period (1910–1945), Gaeseong belonged to Gyeonggi-do and was only about an hour's drive from Seoul. The truce ending hostilities in the Korean War was signed at a building erected at Panmunjeom (Panmunjom) at the center of the demilitarized zone separating the two Koreas. It is also here that prisoner exchanges have taken place and where Chung Ju-yung, then South Korea's richest man, had a herd of cattle sent over into a starving North Korea in 1998.

Mt. Geumgangsan is one of the most important tourist sites in North Korea. During the Joseon Dynasty, Mt. Geumgangsan was a popular excursion destination among the *yangban* class (Confucian literati), and it continues to be recognized today as one of the most beautiful and scenic spots on the peninsula. In 1998, with the

warming of North–South relations, evidenced in such events as the herding of cattle into the North, North Korea began to grant permission for average South Koreans to visit Mt. Geumgangsan. However, in 2008, such visits were canceled after a South Korean tourist was shot and killed by a North Korean soldier on the beach during a visit to the Mt. Geumgangsan region, and they have yet to be resumed. The Mt. Geumgangsan tourism initiative was perhaps the most representative product of the "Sunshine Policy," meant to foster reunification, and was the venture that most effectively softened the mood between the two Koreas. Besides this, other important tourist sites in North Korea are the sacred mountains of Mt. Myohyangsan and Mt. Baekdusan—both associated with Dangun, the legendary founder of the Korean race. Mt. Baekdusan can be climbed from its Chinese side as far as the Heavenly Lake (Cheonji) on the summit, from where one can gaze down on North Korea.

North Korea is a country that clings to a hereditary power structure and whose society adheres to a sort of premodern system of thought. Nevertheless, in the 1990s, when socialist systems were collapsing elsewhere in the world, North Korea's socialist system held steadfast and even weathered two power successions without political turmoil, all evidence of a high degree of stability. And even as its ineffectual dictatorial system has been unable to deal with the problems of starvation and human rights abuses, North Korea is also a country with the world's lowest crime and accident rates.

There are indications that South Koreans in their twenties and younger do not see national unification as a priority. Though the case of Germany proved that the social costs of reunification will of

course be considerable, the majority of Koreans, North and South, remain deeply cognizant of their millennia of shared history, national territory, physical similarities, common language, and cultural affinities. They view reunification as inevitable.

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