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ЗЕМЯТА И ХОРАТА НА КОРЕЯ
KOREA'S, THE LAND AND PEOPLE

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Abstract

This is a study of Korea's case, the Korean peninsula, and it is an investigation aiming at a better understanding of the two countries – North and South Korea and the soils of the Korean peninsula.

In addition, a new view point on the impact of geology, climate, rivers, globalization, rural sector on the environment and soils of the Korean peninsula is suggested. The study is based on and is apart of there search of Professor Sungjae Choo at Kyung Hee University Seoul, Korea and Marin Marinov, Ms Diana Videnova was interested in the Asian countries.

Key words: East Sea, DMZ, Far East, Jangma, reclamation issue, Korea Ginseng Corporation Insam.

INTRODUCTION

Asia is the largest continent on the Earth.

In its eastern peripheral part is Korean peninsula.This part of the continent is also known as the Far East.

On the north border of the Korean peninsula with the Asia mainland is Dumangang river known as geographical name Tumen River. Amnokang river known with geographical name Yalu.

These two rivers are borders of China and Russia with North Korea.

Same two rivers separated the Korean Peninsula from northeastern China known as geographical name Manchuria (or Manchu).

Only 16 km is river border that follow Amnokang River it is the natural borderof Korean Peninsula with Russia.

On the west coastline of the Korean peninsula, the border runs along the Korea Bay and the south boundary continues along the coastline of the West (Yellow) Sea.

East of the Korean Peninsula bordering the East (Japan) sea.

First name used geographical name East Sea name by stele in memory of King Gwanggaeto Great.

The Stele of the Great Gwanggaeto which is located in China's Jilin Province where in 414 A.D. describe the actual boundaries of Goguryeo Kingdom (old Korean kingdom) and used geographical name East Sea for the first time and used inscription on the same stele.

Stele was erected by the son of the Great King Chansu in 414 A.D. in memory of the great work of his father King Great Gwanggaeto at coronation of the Great King Chansu.

Same stele contain inscription 1755 hierogliphs located in 44 lines. 140 chines characters can not be read in the same stele. In same stele describing the then boundaries of the ancient Goguryeo Kingdom and clearly describes that his kingdom is in the east borders with East Sea and in the west it reaches the borders of Manchuria to China. As during the Great King Gwanggaeto, Koguryo's kingdom territory reach to the Primorsky Kray today territory of Russia.

Appearance of the stele with inscription East Sea.

Fragment of the same stele with inscription "East Sea" surrounded in red.

Currently most of the world atlas use the name East sea like publishing companies Collins,Times books, Rand Mc Nally, Meyers Lexikonverlag. Even in the famous Atlases like "Hoelzel-Universalatlas zu Geographie und Geshichte" also be used geographical name East Sea.

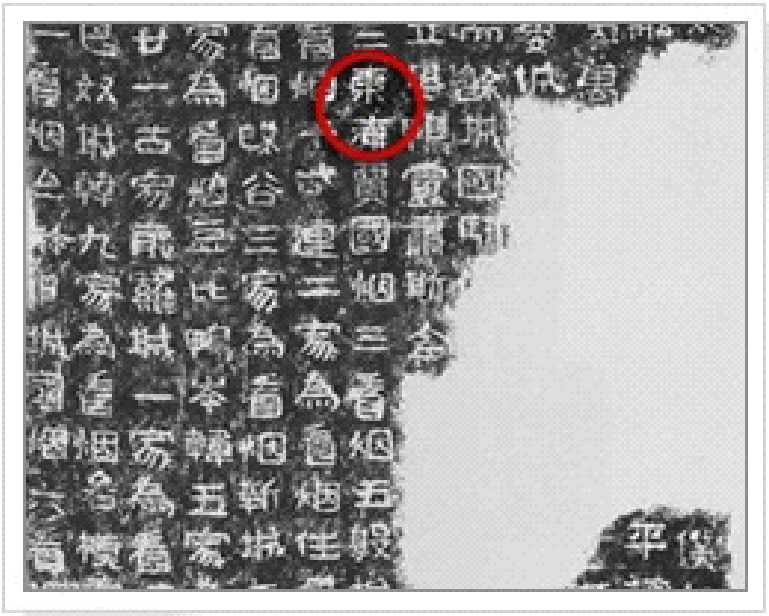


Fig. 1. *Appearance of the stele with inscription East Sea. Fragment of the stele with inscription "East Sea" surrounded in red*

Fig. 2. *PIcture of the DMZ and soldiers*

Only 200 kilometers separate the Korean peninsula from China via sea and also 200 kilometers separate from t Korean peninsula and shores of Japan isles.

Korea Peninsula has approximately rectangular shape as the distance from the northernmost to the southernmost point of the peninsula is approximately 1100 km.To the peninsula belong more 3960 islands Together with the same adjacent island total area of the Korean peninsula is 223.170 square kilometers.

The 45% by the area of Korea peninsula belongs to the Republic of Korea, of the excluding of the area of the DMZ. Demilitarized Zone is (DMZ) with size 241 km \ 4km wide strip (for more information on DMZ http://www.dmz.ne.kr/ENG/index.asp.)

The total area of North and South Korea is almost like Great Britain 244,100 square km. area or like Guyana 215,000 square km. Only the area of the Republic of Korea islike Hungary 93 000 square kilometers or like the Kingdom of Jordan. Excluding the area of the demilitarized zone (some authors include the area of the DMZ in its publications). DMZ belongs neither North nor South Korea.

After the end of the Korean War-1953. In, the area of the DMZ is with limited access of the Korean peoples in both countries.

Fig. 3. *DMZ shown by the blue line on middle of the map. Use the two romanization systems in one map*

This limited access of persons turns DMZ zone in true ecological paradise.

Since 2008 after the drainage of soils from flooded, areas of the sea during high tide added wasplus 70 km^2 to the area of South Korea as result of built dikes.

Since 2009 year, the total area of South Korea's country is total 100,210 km^2.

In the 11th century in the territory of The King-dom Korea encompassed also the most of Manchuria but in the 15th century as a result of repeated conflicts with China, Koreans retreated territory of Manchuria and in the same period was established the border with China from southeren of the river and Amnokang Dumangang.

From this period dated back defined of the Korea- Chinese border on the shores of the both rivers Dumangang River and Amnokang River.

Durinng of World War II, the Korean Peninsula divided was into two-occupation zone. North part from Korean peninsula occupied by troops of the Soviet Union and southern zone occupied by the troops of the USA.

Before the Korean War since 1950-1953 year, Korea was a single the united and unitary country.

After the Korean Warbelligerents, countries in military conflict agree and determinate the border between the two occupation zones 38° parallel as a border.

The Korean's War 1950-1953 year determinate the new border between North and South Korea fixed waswith DMZ zone between North and South Korea.

Korean Peninsula has a unique geographical location like a "bridge" between China, Japan and Russia.

Geographical the climate of Korean peninsula and determined pronounced different in the cold climates of the north and warmer in the south part of peninsula.

Fig. 4. *A photo of the Korean`s islands Dokdo*

The tipsof geographical points of all direction are: See tabl.1.1

Dokdo Island are Korean territory and composed of the two largest islands Dongdo, Seodo (Dongdo, Seodo) and 89 separate rock islands with a total area 187,554 ㎡ island is known by the name Liancourt Rocks.

See the map of islands Uleugdo and Dokdo and photos of the Korean islands Dokdo.

Underwater sand bank Yedo is separate from mainland of the Korean peninsula 149 ㎞ and located southwest of the island of Maradi (Marado) 4.5 m under the water surface. Underwater sand bank Yedo.

Table 1.1.

Extreme points	Place	Coordinates
Northernmost	Yuwonjin, Hamgyeongbuk-do	43º00′42″ N
Southernmost	Marado, Jeju Special Self-Governing Province	33º06′43″ N
Easternmost	Dokdo, Gyeongsangbuk-do	131º52′22″ E
Westernmost	Maando, Pyeongangbuk-do	124º11′04″ E

Fig. 5. *The map of the Korean`s islands Uleugdo and Dokdo*

It is location of the 149 km away from the Republic of Korea, 276 kilometers from Japan and 287 kilometers from China.

It was established Oceanographic research station built in 2003 from the Republic of Korea.

Scheme Research Station.

Romanization systems and type the name of the Korean language

The McCune-Rayshauer and Standardized system for the romanization of the Republic of Korea are two systems of the romanization of Korean language. The Russian scientist Lev Kontsevich created the system of the Cirilization of the Korean language.

Examples of the fictionalization and types the names of the Korean language.

Romanization of the Korean language

Taegu ⇒ Daegu, Pusan ⇒ Busan, Chŏnju ⇒ Jeonju, Kimpo ⇒ Gimpo, Chŏnju ⇒ Jeonju Chonju ⇒ Chonju ⇒.

Use the two romanization systems in one map. See the physical map of the Koreian peninsula in upper pages.

Korea and Japan are in the same time zone and share together 135^0E meridian. This is reason, the time difference with the Greenwich meridian is 9:00 for both Korea and Japan.

Geopolitical feature of the Korean Peninsula

Korean Peninsula has a unique geographical location it is like a “bridge” between China, Japan and Russia. Here in Korean peninsula are meet and find intersection of the technology by Japan andUNLIMITED natural resources of the Russia and the China workforce. See Fig. 8.

Furthermore, the Korean Peninsula is the front door of the Far East to the European continent.

From here, begin shortest marine and railroad way from the Far East to Europe.

Fig. 6. *Oceanographic research station leodo, built in 2003 by the Republic of Korea*

From Korean peninsula via Russia and Arctic Ocean seaway and the Baikal- Amur Railway,orhigh railways are short way to Europen continent.

Climate

Meteorogical observation in Korea date back to the period of the Three Kingdoms (1st centuriey - 6 century) in Korea. The rich records of the wether

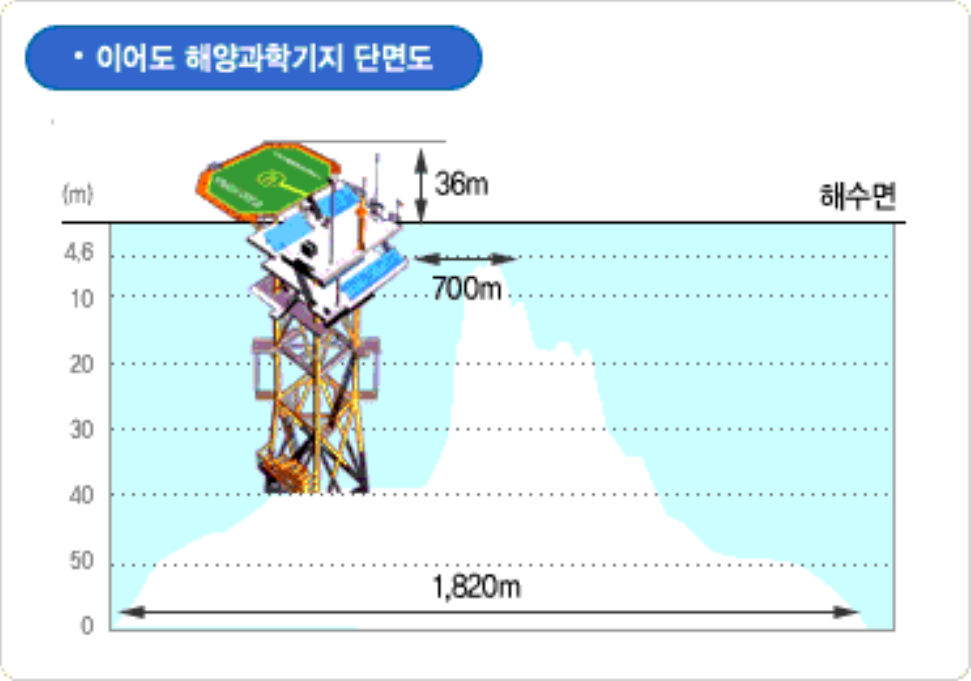


Fig. 7. *Scheme of the Research Station leodo*

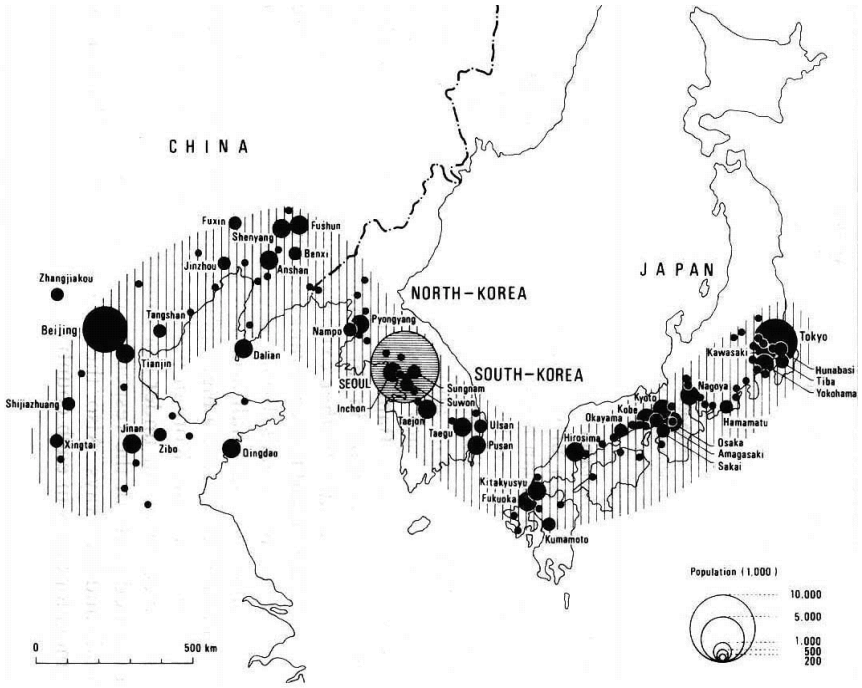


Fig. 8. *Unique geographical location of the Korean Peninsula like a "bridge" between China, Japan and Russia*

Fig. 9. *Russia's Arctic Ocean and seaway*

found in the book *Samguk Sagi* (The History of Three Kingdom). The King Sejong (r. 1418–1450), the 4th king of Choson Kingdom kept and further developed *Soun-gwan* (an astronomical and meteorological observatory), invented the rainfall gauge. See picture below.

One of the most distinct climatic features over the Korean Peninsula is the Asian monsoon System. It is cause by a large heat contrast between the Asian interior landmass and the Pacific Ocean.

In winter, cold and dry conditions prevail because of the intrusion of local northwesterly (i.e., from the northwest) flow from the clockwise winds spiraling from the large, quasi-stationary, semi-permanent Siberian high pressure system to the west. In summer,a warm and moist climate exists owing to the influence of local southeasterly flow spiralingfrom the quasi-stationary, semi-permanent North Pacific high pressure system to the southeast.

The long north-south distance and the complicated topography, the Korean Peninsula has a wide diversity of local and regional climates. The adjacency of the northern region to the large Eurasian continent and the proximity of the southern region to the ocean demonstrate that the peninsula is strongly affected by both the continent and ocean, respectively.

Korea has relatively abundant precipitation comparison Europe. In the summer absent long, dry periods of drought like Plovdiv. See

Fig. 10. *Rainfall gauge The King Sejong (r.1418–1450), the 4th king of Choson Kingdom*

climatograms of Plovdiv, London and Seoul below. The yellow colour on diagram show dry period for Plovdiv (Bulgaria).

The climographs are by Verlag Ed. Hoelzel Ges.m.b.H.Nfg KG, Wien. See fig. 12, 13, 14.

Precipitation

The many mountainous and hilly areas also influence local and regional climates, including the obvious impact of elevation changes on temperature and orographic effects on precipitation.

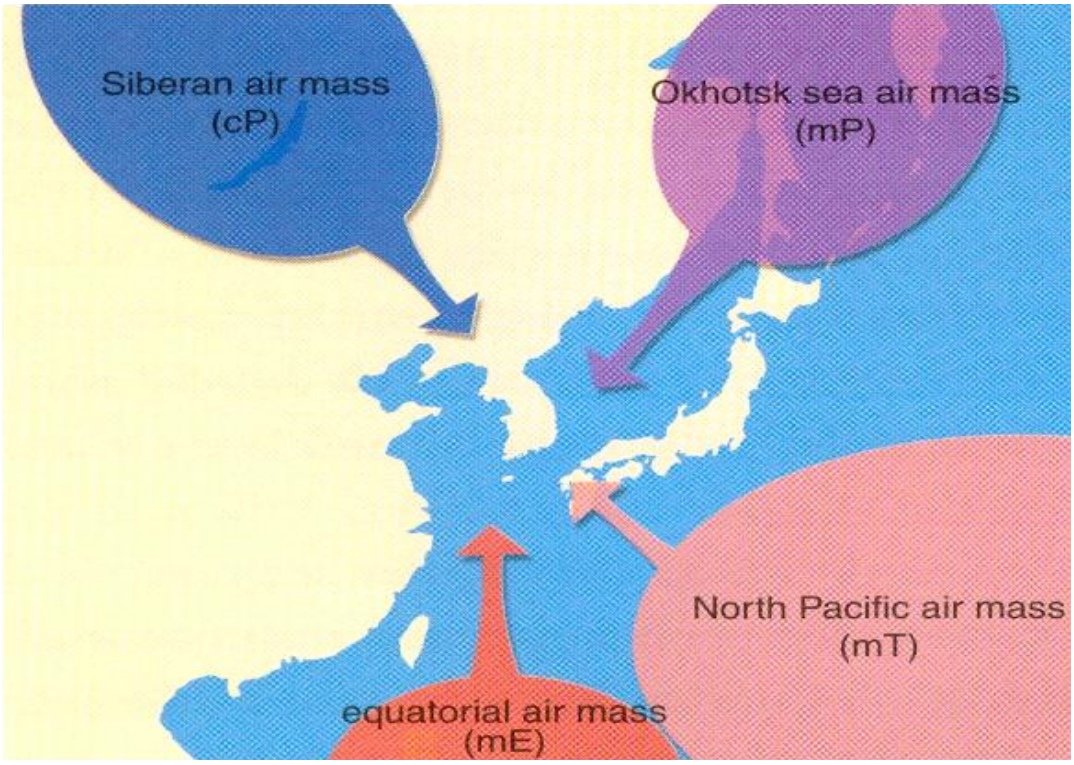


Fig. 11. *North Pacific high pressure system*

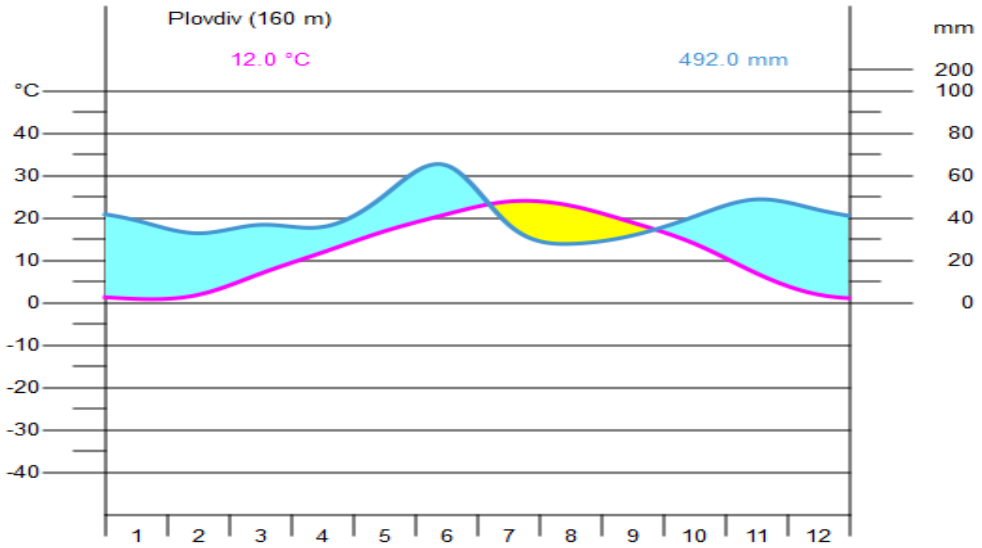


Fig. 12. *The climatogram of Plovdiv, Bulgaria*
The climograms are by Verlag Ed. Hoelzel Ges.m.b.H.Nfg KG, Wien

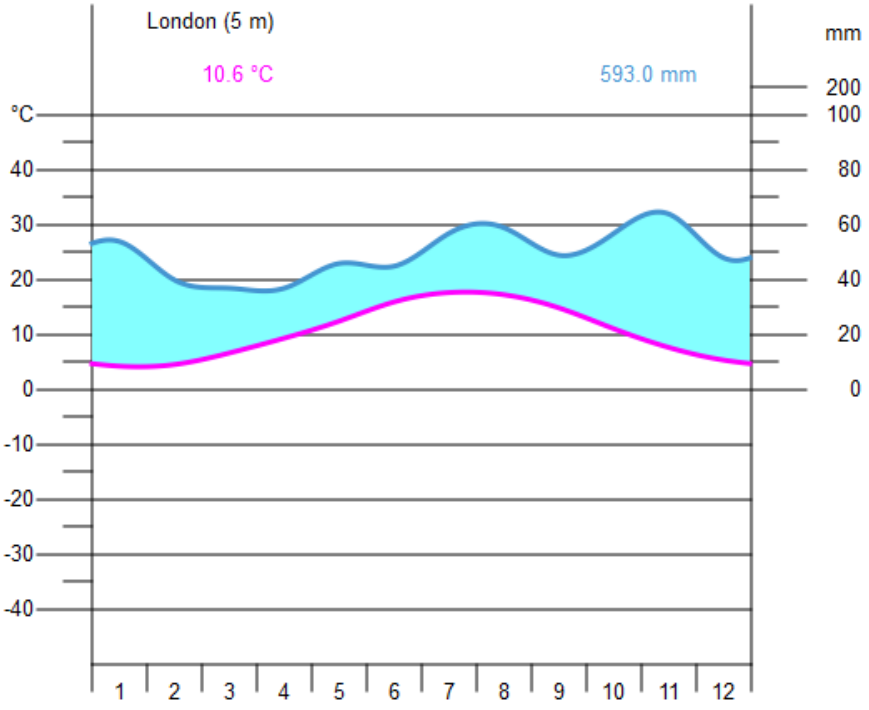


Fig. 13. *The climatograms of London, U.K.*
The climograms are by Verlag Ed. Hoelzel Ges.m.b.H.Nfg KG, Wien

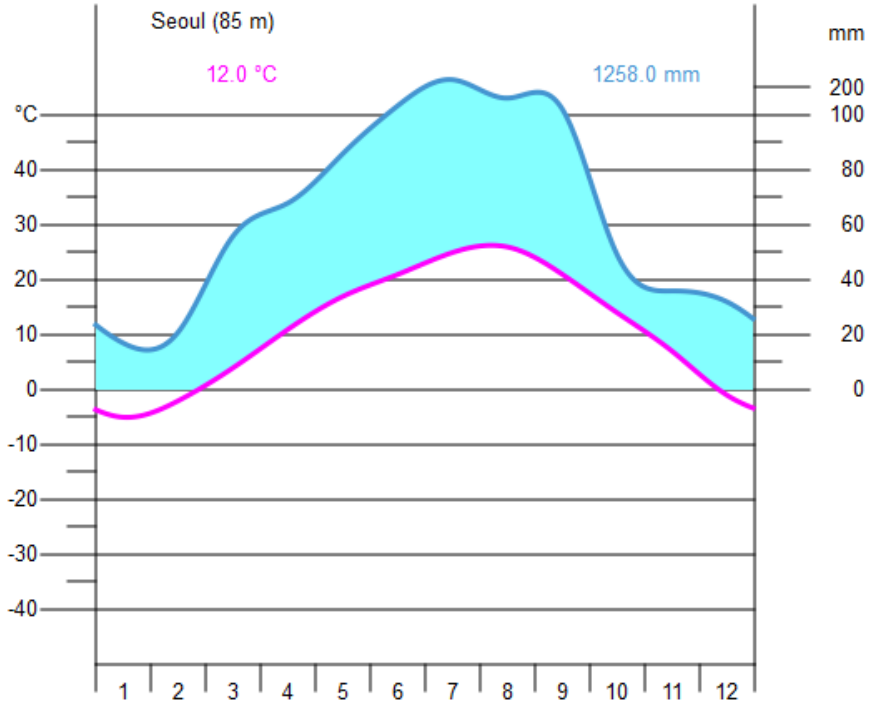


Fig. 14. *The climatogram of the Seoul, the Korea Republic*
The climograms are by Verlag Ed. Hoelzel Ges.m.b.H.Nfg KG, Wien

Korea has relatively abundant precipitation with an annual mean of about 1,200 mm, butregional differences are large because of the complicated topography. The major producers ofprecipitation include extratropical cyclones with their trailing fronts, Changma fronts, andtyphoons. Typhoons since August and September to Korea.

Any precipitation producing mechanism can produce increased to where topographically-enhanced atmospheric lifting occurs. Extratropical cyclones affect the entirepeninsula, but the amount of precipitation from such cyclones varies spatially according to the speed and direction of storm movement, and local topographic effects. Precipitation from Changma fronts differs greatly across space because such fronts typically move back and forthin a south-north direction. As in much of Asia, winter (December through February) in Korea is a dry season. Winter precipitation averages below 10 percent of the annual precipitation total except for someislands and coastal areas, but regional differences in the intensity of winter dryness do exist.

In the winter three days cold, four days warm in Korea.

Ulleungdo has the largest winter precipitation totals (296.1 mm), which is about 25 percent ofits annual precipitation. The coastal areas in Gangwon-*do* also experience relatively abundant winter precipitation due to snowfall caused by the combined effects of northeasterly airflowand the low temperatures of the Taebaek Mountains.

During summer, the southwesterly winds from the Asian summer monsoon circulation and the southeasterly winds from the western edge of the North Pacific high pressure area converge near Korea to create updrafts and zones of rainfall, particularly where mountains canenhance the updrafts. June through August precipitation represents about 50 to 60 percent ofthe annual precipitation total. These months are characterized by frequent heavy rainfallevents in association with Changma fronts, typhoons, and extratropical cyclones. Summer precipitation generally decreases from the coast to the inland regions. The northwestern Yeongseo regions including Seoul, Ganghwa, Cheorwon, and the southern coasts have the most summer precipitation. On the other hand, the east coast and inland areas in Gyeongsangbuk-*do* have less summer precipitation.

Because the varying topography creates temperature differences and differing availability of oceanic moisture, snowfall totals differ among regions more widely than other climatic features. Snowfall in Korea is generally caused by three

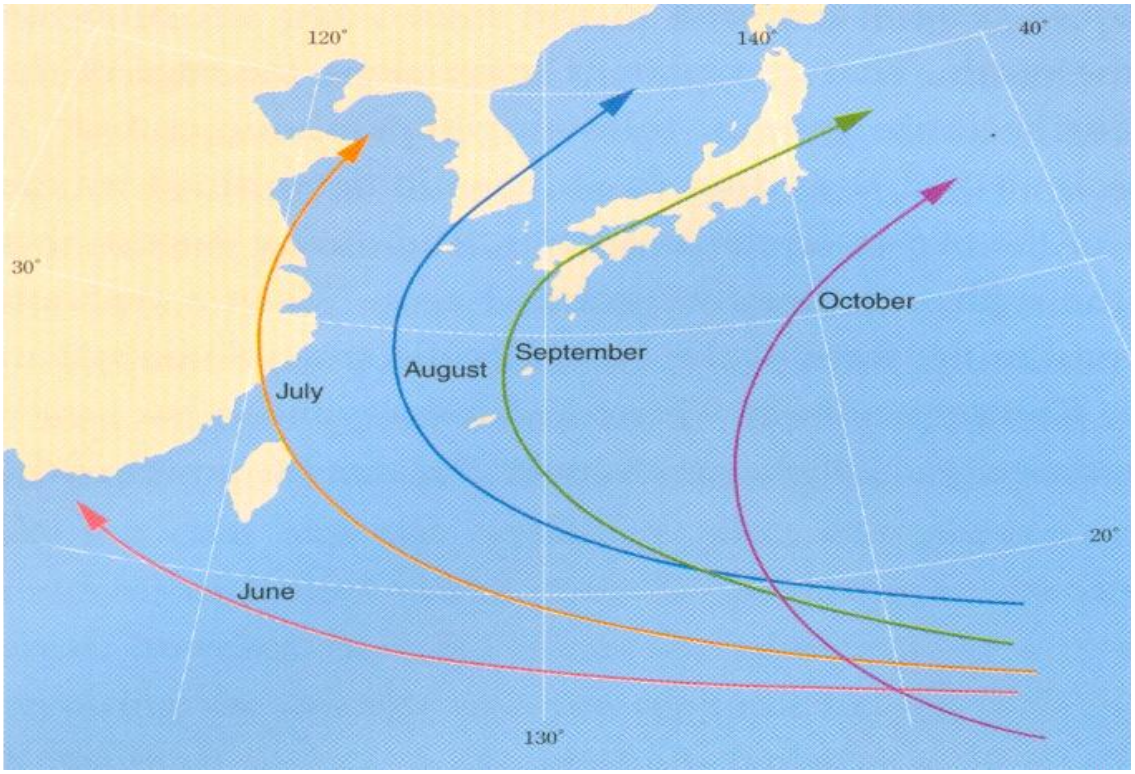


Fig. 15. *Typhoons since August and September to Korea*

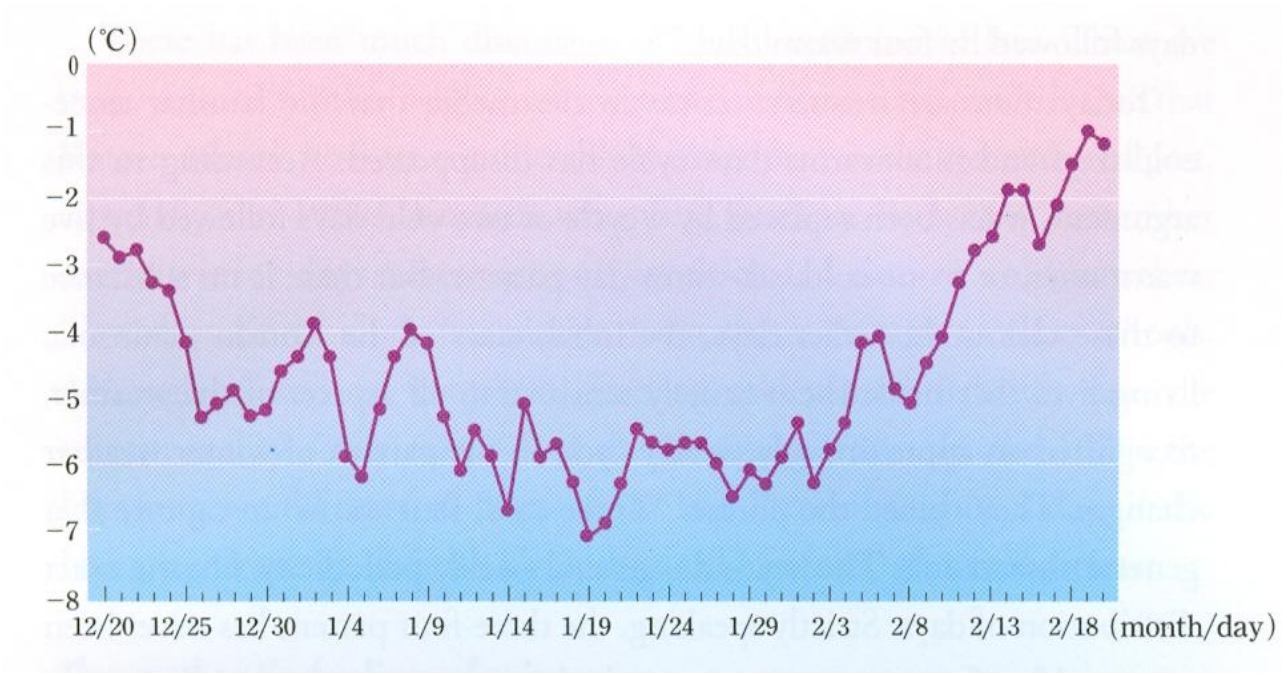


Fig. 16. *Winter in Korea three days cold, four days warm*

meteorological mechanisms: the passage of the extratropical cyclone, expansion of the semi-permanent and quasi-stationary.

Siberian high pressure system, and the passage of migratory high pressure systems which produce uplift at mountains. Daegwallyeong has the largest annual snowfall totals (243.1 cm), with the snow generated by both cyclones and lifting associated with high pressure systems. Snowfall in Ulleungdo (232.8 cm) is possible from all three mechanisms.

In winter, the prevailing northwesterly winds are caused by the clockwise flow around the eastern side of the quasi-stationary, semi-permanent Siberian high pressure zone over the north-central Asia.

In summer, southerly winds resulting from the North-Pacific quasistationary, semi-permanent high pressure system dominate Korea. However, local topographic effects make this monsoon al flow more complicated.

Over the mountainous regions, lower temperatures cause the snow season to begin early and end late. Over the southern coastal region, the snow season begins later and ends earlier, owing to the higher air temperatures caused by longer summer days and higher angles of thesun in the sky, along with the slow release of energy accumulated during the summer throughout winter. The first snow of the season on average falls around November 5 at Daegwallyeong, but at Geoje on the southern coast it occurs near December 30.

The mean date of first snowfall in Seoul, Mokpo, and Busan is November 21, November 26, and December 20, respectively. The mean last snowfall occurs around February19 in Geoje and Busan, March 11 in Mokpo, and March 21 in Seoul, but not until April 19 in Daegwallyeong.

Predictably, the first frost occurs earlier over the northern parts of Korea than over the southern region, and earlier over inland locations than coastal regions.

At Mokpo on the southwestern coast, the mean date of the first frost is November 26 while themean date of the last frost is March 21. By contrast, the earliest mean date of the first frostoccurs over the mountainous Gangwon-*do* region on September 7, with the mean date of thelast frost on May 30. Over inland regions, the mean date of the first frost ranges from October 17 to 27, and the mean date of the last frost ranges from the first to the second tendays of April.

Because cooling factors are more prominent over mountainous regions than in the coastal region, the mean frequency of fog days increases from coastal to mountainous regions. The annual mean number of fog days at Daegwallyeong is about 120 days, while over eastern coastal regions only about 20 fog days per year occur.

Temperature

The annual mean temperature generally increases from north to south and is higher in the coastal areas than in the inland areas. It ranges from about 6 to 16 C°, responding to the effects of latitude, continentality, topography, and atmospheric and oceanic circulation features. Air temperature is lower in the Taebaek and Sobaek mountain ranges, and higher in regions nearer to the southern coast. Because of the effect of warm Pacific Oceancurrents, the eastern coastal areas have higher mean temperatures than those on the west coastat the same latitude. For instance, the annual mean temperature in Gangneung near the easterncoast is 12.9C° while that in Incheon near the western coast is 11.7C°. Daegwallyeong 6.4 C° has the lowest annual mean temperature in South Korea because of higher elevations 842.5 m and latitude. Seogwipo has the highest annual mean temperature 16.2 C° largely because its extreme southern and insular location protects it from the cold dry air circulated by the Siberian high pressure system in winter.

Winter is the coldest season and January is the coldest month in Korea due to the influence of the frigid Siberian air mass. Winter temperature increases from north to south in a similar spatial pattern to that of annual mean temperature.

During winters, the temperature difference between the areas east and west of the Tabaek Mountain Range ismore pronounced because the mountains limit the impact of the cold, northwesterly wind toward the east.

Also, the warmer water temperature in the East Sea substantially increases thewest-east temperature difference. At Gangneung on the east coast, January mean air temperature is 0.3 C° while at Incheon on the west coast it is -2.4. Daegwallyeong has the lowest January mean temperature - 7.6 C° in South Korea. In the central areas of South Korea, the mean monthly temperature is below freezing only from December to February, butis from December to April at Daegwallyeong. Not surprisingly, January mean temperature is highest at Seogwipo 6.6 C° and is above 2 C° in most of the southern coastal area.

In summer, the North Pacific high pressure and its associated circulation from the south dominate the climate in Korea. Summer is the hottest season and August is the month with thehighest temperatures, except for the inland Gaema Plateau and surrounding areas in North Korea, which experience July maxima. August mean temperatures show less difference between northern and southern regions, and even less between eastern and western regions, incomparison with winter.

Major mountains in Korea are: Seoraksan Hallasan, Jirisan, Bukhansan, Odaesan, Naejangsan, Songnisan.

Between the Korean Peninsula and Manchuria flow, in the opposite directions, lie the two largest rivers of the region, the Amnokgang (river) and Dumangang (river), both originating at Mt. Baekdusan (2,744 m), the highest mountain in the region. The peninsula is surrounded by the Yellow Sea, the East Sea, and the South Sea.

Nearly 70 percent of the Korean Peninsula is covered by mountains and hills. Low hills in the southern and the western regions give way gradually to increasingly higher mountains toward the eastern and the northern areas.

On the whole, the western and southern slopes ofthe peninsula are wide with some plains and basins along rivers, while the eastern slope is very steep as high mountains precipitate into the East Sea.

Fig. 17. *The Major mountains are Seoraksan, Hallasan, Jirisan, Bukhansan, Odaesan, Naejangsan, Songnisan*

Fig. 18. *The Major mountains and national parks in Korea*

Most of the high mountains are located along the Taebaek mountain range which runs parallel to the east coast, roughly north-to-south. West of this range are the drainage basins of the Hangang and Geumgang rivers. This range extends to the Nangnim range in North Korea, forming the geological and geomorphological backbone of the peninsula and constituting the watershed between the western and eastern slopes of the peninsula. Mt. Nangnimsan (2,184 m), Mt. Geumgangsan (1,638 m), Mt. Seoraksan (1,708 m), and Mt. Taebaeksan (1,567 m) are some of the highest peaks along these ranges. Just southwest from the Taebaeksan range is the Sobaeksan range, which culminates in the massive Mt. Jirisan (1,915 m). This range was historically a great barrier between the central and southern parts ofthe peninsula, and also between the eastern and western regions in the south. The Nakdongriver basin is thus segregated in southeastern Korea. The Gaemagowon Plateau, the so-called “Roof of Korea,” located in the northwestern corner of the peninsula, has an average elevationof about 1,500 meters above sea level.

The landmass of the peninsula is rather stable geologically in spite of its proximity to Japan; it has neither active volcanoes nor strong earthquakes. There are, however, a few dead volcanoes that were formed during the Pleistocene era. Mt. Baekdusan is famous for a large caldera lake, “Cheonji”, meaning heavenly tarn. Mt. Hallasan in Jeju special self-governing province island, the highest mountain in South Korea, was recorded to have had minor volcanic activity in the early 11th century. It has a small crater lake, “Baengnokdam”, and there are about 400 parasitic cones in its piedmont.

About two-thirds of the Korean Peninsula is composed of pre-Cambrian metamorphic and granitic rock. Although the distribution of sedimentary rock is very limited, limestone is quite abundant in some regions and a number of limestone caves can be found, some of which are tourist attractions.

Rivers

General characteristics

Most of large rivers on Korea peninsula such as the Amnokgang and the Hangang flow westward into theYellow Sea because of the high backbone mountains near the East Coast. These rivers with relatively low channel gradients transport sizable sediment loads from the large catchment areas and sometimes deposit them on the channel beds or low places near channels to make large alluvial plains and basin floors along the channels. However, the rivers on the steep east slope of the backbone mountains flow under quite different morphological conditions with small but steep drainage basin. These rivers have relatively short channel lengths, but flow fast with high velocity and transport more coarse channel bed materials than the rivers in the opposite gentle slope of the backbone mountains.

The river discharge is very changeable seasonally since over the half of annual precipitation, mostly rainfall, occurs during summer rainy season lasting for about one month.

Flooding caused by intensive rainfall often occurs over bank in the summer season. During the dry season from winter to spring, however, it is common to see little water even at the reaches of large channels. This flow regime influenced rivers to have morphological characteristics with wide and shallow channel in which various kinds of gravel or sand bars are developed.

Stream channel pattern which means the plan form is generally divided into three groups: straight channel, braided channel and meandering channel. Researchers are traditionally more interested in meandering channels with high sinuosity index. There are two kinds of meandering, free meandering and incised meandering. Free meandering channels are usually found on alluvial plain formed at places where streams flow into trunk streams and get into the sea or lake. Nowadays, most of the free meandering channels have been channelized to protect the land from flooding and drain away stream water more effectively.

Rivers make various kinds of unique landforms in and near waterway by erosional and depositional processes. In terms of human activities, fluvial landforms such as flood plains and river terraces are more important since these comprise flat land surface with fine fluvial sediments. Most flood plains are made through lateral accretion occurred by channel migration and also vertical accretion by over bank inundating.

Fig. 19. *The river bed in Korea*

Table 2.2. Principal rivers in Korea

Name	Drainage Area(km^2)	Main River Length(km)	Main River Gradient(‰)	Coefficient of River Regime	Note
Hangang	25,953	494	2.33	1:393	Entering Yellow Sea
Geumgang	9,912	398	1.25	1:298	
Yeongsangang	3,468	137	2.93	1:684	
Mangyeonggang	1,504	81	4.04	-	
Ansungcheon	1,656	76	1.40	-	
Sapgyocheon	1,649	59	1.80	-	
Nakdonggang	23,384	510	2.10	1:372	Entering South Sea
Seomjingang	4,912	224	3.87	1:715	
Hyeongsangang	1,133	63	8.06	-	Entering East Sea
Namdaecheon	475	55	23.53	-	
Osipcheon	394	56	19.23	-	

Flood plains can be divided into natural levee and back swamp in case of large plains.

Natural levee is higher than back swamp and composed of more coarse materials such as sands while silt or clay size sediments are deposited in back swamp. Because of these landform characteristics, natural levees have been used for the location of towns and industrial activities for a long time.

Management of arable land and soil resources in Korea

The importance of soil as a basis for better agriculture is adopted before many years.

The first book entitled Nong -Sa -Jik -Seol (Instructions for agriculture) was published in 1429 during the reign of King Sejong the Great (Great King Sejong). It explores the soil quality and it I is mentioned in detail on how and when to plow the land, how to improve soil fertility, and even how to test soil quality.

Many books on agriculture was published during the Lee dynasty, as in the book of Nong - Sa -Jik -Seol.

In 1959 an attempt was made to study the quality of the soil and some of the results published in make the soil map 1:500,000 to several area around the cities of Daejeon, Daeduk and Suwon. The first modern way to study soil was laid in 1964 when the Korean government and FAO and the UN jointly organized organization in Korea Korea Soil Survey Organization and Plant Envvironment Research Institute now existing under the name Office of Rural Development located in the city of Suwon.

The study of soil begins with making aerial photographs made during 1964-1967. A most detailed study of the taxonomy of soil was conducted by the US Department of Agriculture.

Now detailed soil map at a scale 1:25,000 all over the country are available for use in paper and detailed digital soil map 1:5000 are provided online for public use.

In Korea using taxonomy USDA soil and are classified as follows. See table 3.3.

Korean nutrients in soils are low and are considered less fertile due to the dominance of rock crystal and acid rock also conditioned by the general weather conditions and the large slope farmland determine leaching and soil erosion.

The result of the analysis of soil over 400,000 soil samples show that the average organic content is 2.3% for rice fields and 2.2% for dry field soil.

Average effective phosphorus and cations are 100 ppm and 8.60 meq / 100g respectively.

The low level of nutrients in the soil requires intensive use of fertilizers, leading to acidification (see attached maps from The National Atlas of Korea) and degradation used as farmland.

Intensive use of soil also causes compaction of the soil, which in turn accelerates the erosion of the topsoil and leads to reduction of water content in soil.

The annual loss of soil Korea is estimated at more than 50 million tons per year.

The average loss of soil from dry fields are 37.7 t / ha, and the loss of soil from forests and rice paddies are 3.5 t / ha and 1.0 t / ha, respectively.

Table 3.3. Catenary soil development at granite and granitic gneiss by Yeon Kyn Sonn (2007), Sun-Ho Yoo (2000)

Soil series (tong)	Samgak»	Sanagju»	Eungok»	Sacheon»	Yecheon»
Landforms	Low relief, hils and steep slope	Base of hill, intermonate valley, alluvia fan	Intermountain valley, alluvial fan	Intermountain valley, alluvial fan, alluvium	Intermountain valley, alluvial fan, alluvium
Soil drainage	very well drained	well drained	slightly drained	poorly drained	very poorly drained
Soil texture	Sandy loam	Sandy loam	Sandy loam	Sandy loam	Sandy loam
Effective soil depth	30-50 см	30-50 см	50-60 см	50-60 см	10-30 см
pH	4,5-5,5	-	4,5-5,0%	4,5-6,5	-
CEC	5	6	5	10-15	10
Base saturation%	30%	60%	45%-70%	Повече от 60%	Над 60%
Land use	forestes	dry fields (orchards)	Paddy fields (dry fields)	Paddy fields	paddy fields (flooded)
Soil types	Dystrudepts	Eutrudepts	Eutrudepts	Eutrudepts	Eutrudepts

Table 4.4. Major soil types and their distribution area by Rural Development Agency, The National Institute of Agricultural Science and Technology of Korea Republic

Order	Suborder	Great group	Area	Ratio %
Inceptysols	Aquepts	Endoaquepts	9,482,02	9,99
		Epiaquepts	245,29	0,26
	Udepts	Dystrudepts	44 984,30	47,41
		Eutrudepts	15 954,45	16,28
		Fragiudepts	219,49	0,23
Entisols	Aquents	Fluvaquents	112,45	0,12
		Endoaqents	581,52	0,61
		Hydraqents	37,91	0,04
		Psammaqents	178,24	0,19
	Fluvents	Udfluvents	1 067,51	1,13
	Orthents	Udorthents	10 478,79	11,04
	Psamments	Udipsamments	1 443,39	1,52
		Quartzipsamments	392,76	0,41
Ultisols	Udults	Hapludults	4 731,86	4,99
		Rhodudults	3,88	0,00
Alfisols	Aqualfs	Epiaqualfs	235,80	0,25
		Endoaqualfs	388,56	0,41
	Udalfs	Fragiudalfs	498,17	0,53
		Hapludalfs	2 352,10	2,48
Andisols	Udands	Hapludands	675,48	0,71
		Fulvudands	324,57	0,34
		Melanudands	380,56	0,40
		Durudands	13,68	0,01
	Vitrands	Udvitrands	6,25	0,01
Mollisols	Udolls	Hapludols	82,24	0,09
Histosols	Saprists	Haplsaprist	0,44	0,00
	Hemists	Haplhemists	5,12	0,01
Total			94 876,84	100%

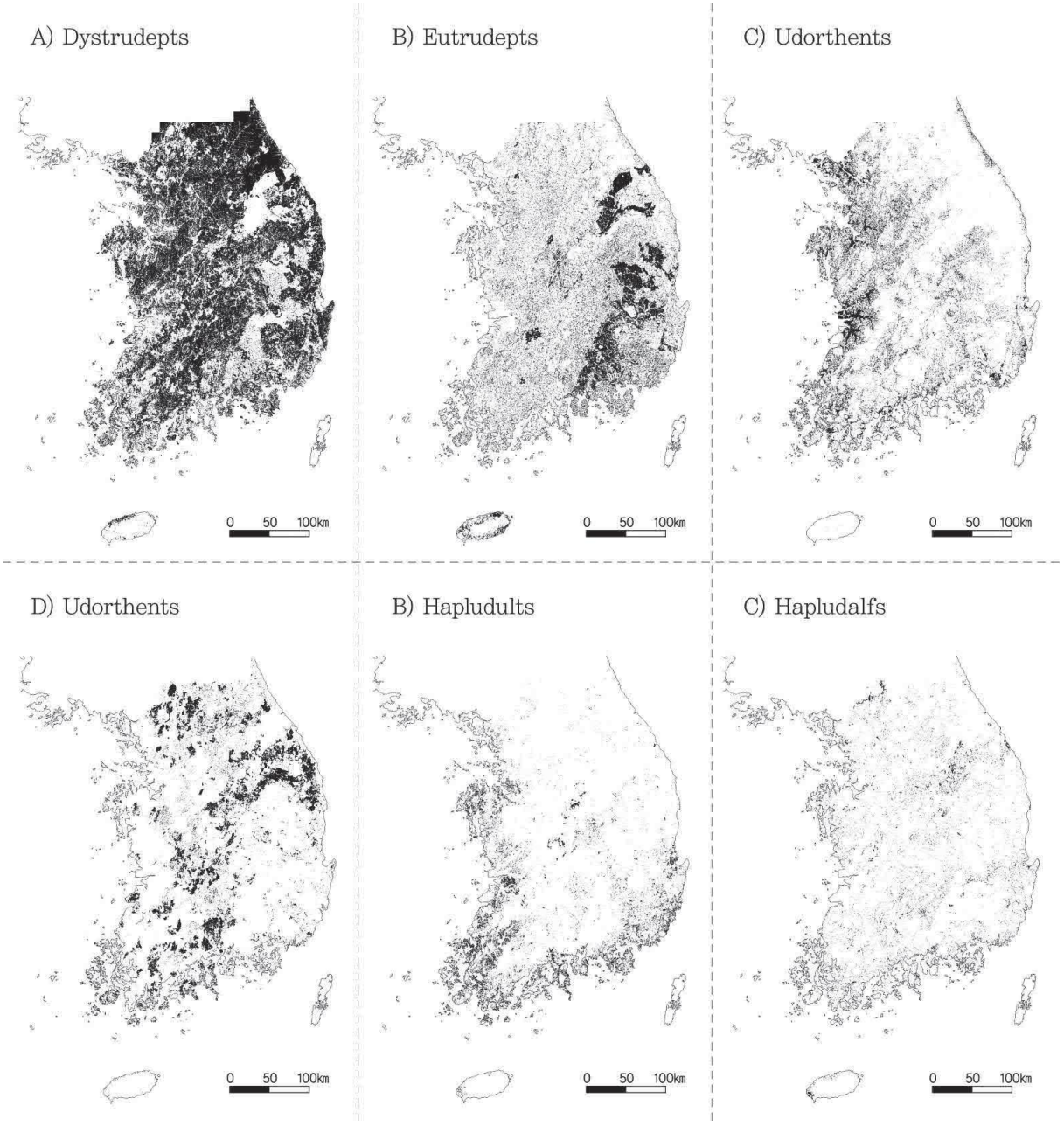


Fig. 20. *The spatial distribution of great soil groups in Korea*
A) Dystrudepts (47.4%), B) Eutrudepts (16.8%), C) Endoaquents (10.0%),
D) Udorthents (11.0%), E) Hapludults (5.0%), F) Hapludalfs (2.5%)
(by: National Institute of Agricultural Science and Technology, 2007)

Non-irrigated cultivated lands, which occupy less than 10% of the total area of which lost more than half of soil a year or about 27 million tonnes.

Soil erosion in Korea is particularly a problem in the mountainous areas of the province Gangwondo and southern parts of Korea. It is also a serious problem with the large amount of rainfall in the region, in about Namhe-gun,Geojae-gun, Gosung-gun.

Soil loss from rainfed agricultural lands in Korea see table 5.5.

The National Geographic Information Institute, by ”The National Atlas of Korea”.

With the rapid growth in demand for organically grown seasonal vegetables, soil erosion has become an important environmental issue for mountain areas in recent years.

Contamination of soil are not so great, except for a few industrial zones. Chromium Cr6 + in soils decreased and was not detected in 2004.

Besides, Cd, and the overall content of pollutants in the soil level remains low and stable, because the monitoring of pollutants in soil is very strict in Korea.

In general, urban areas of cities such as Seoul, Busan and Incheon shown a relatively high level of pollution, while a special Self-governing province Jeju and Gangwondo, and Chungchungbuk-do maintain a low pollution maintaining a low level of pollution.

Comparison of agricultural land to other lands and level of soil contamination of rice fields and dry farmlands are similar to the average, but soil contamination orchards showed a higher level of pollution due to the use of agricultural chemicals and fertilizer pollution.

Soils in Korea show complex spatial distribution heterogeneous rock and stone, and in addition, and landforms made of rocky material, and also the long history of human intervention on the soil.

Two different systems of classification and description of soils currently used in Korea.

The first is the soil taxonomy developed by the USDA, and the other is a three-level hierarchical classification system developed for forest soils in Korea.

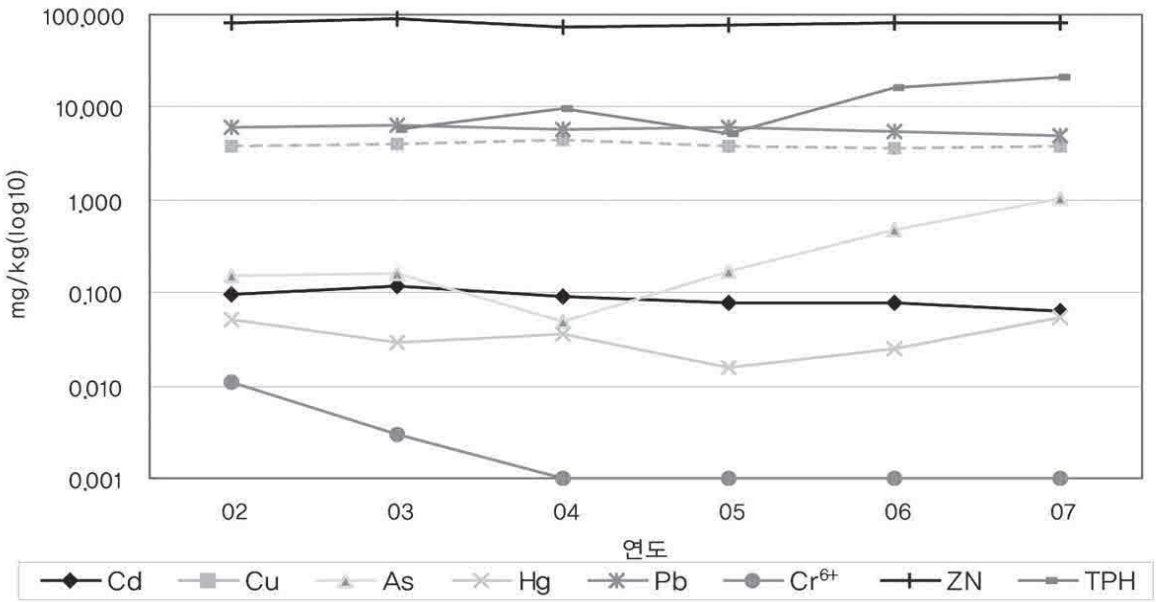
According to soil taxonomy of Korea, soils found in South Korea are 7 types of existing peninsula among 12 orders designated.

Table 5.5. Soil loss from rainfed agricultural lands in Korea

Soil erosion class	Week	Slightly week	Moderate	Slightly severe	Severe	Very severe
Annual soil loss (ton/ha)	0 ~ 6	6 ~ 11	11 ~ 22	22 ~ 33	33 ~ 50	50 <
Rainfed agricultural land (thousand ha)	126	99	159	82	85	168

By National Geographic Information Institute, The National Atlas of Korea

Table 6.6. Temporal changes of soil pollutants



Source: Ministry of Environment of Korea, 2007

Fig. 21a. *Clasification of the soils in South Korea*

They are divided into 14 suborder, 27 great groups and 390 soil series.

74.7% of the territory of South Korea (about 6.7 million hectares) are classified as primary soil Inceptisols, while Catenary developed soil on granite and gneiss are granitnito- 15.1 percent (about 1.3 million hectares) of them Entisols.

The dominance of these two types of soils.

It shows that the general that the overall pedogenic soil conditions in Korea inhibit the formation of well-definedsoil horizons. Ultisols and Alfisols (gray forest soils), accumulation of clay in their B horizons hold 4.99% and 3.67% of the surface soil of South Korea, respectively.

Acidic soil Ultisols are common in hilly terrain and gentle slopes at the base of the mountains, while the base-rich Alfisols are often on flat areas near streams or on rough and alkaline rocks. Andi-sols form of volcanic rocks and materials occupy less than 1.5% of the soil of Korea. They are the dominant soils

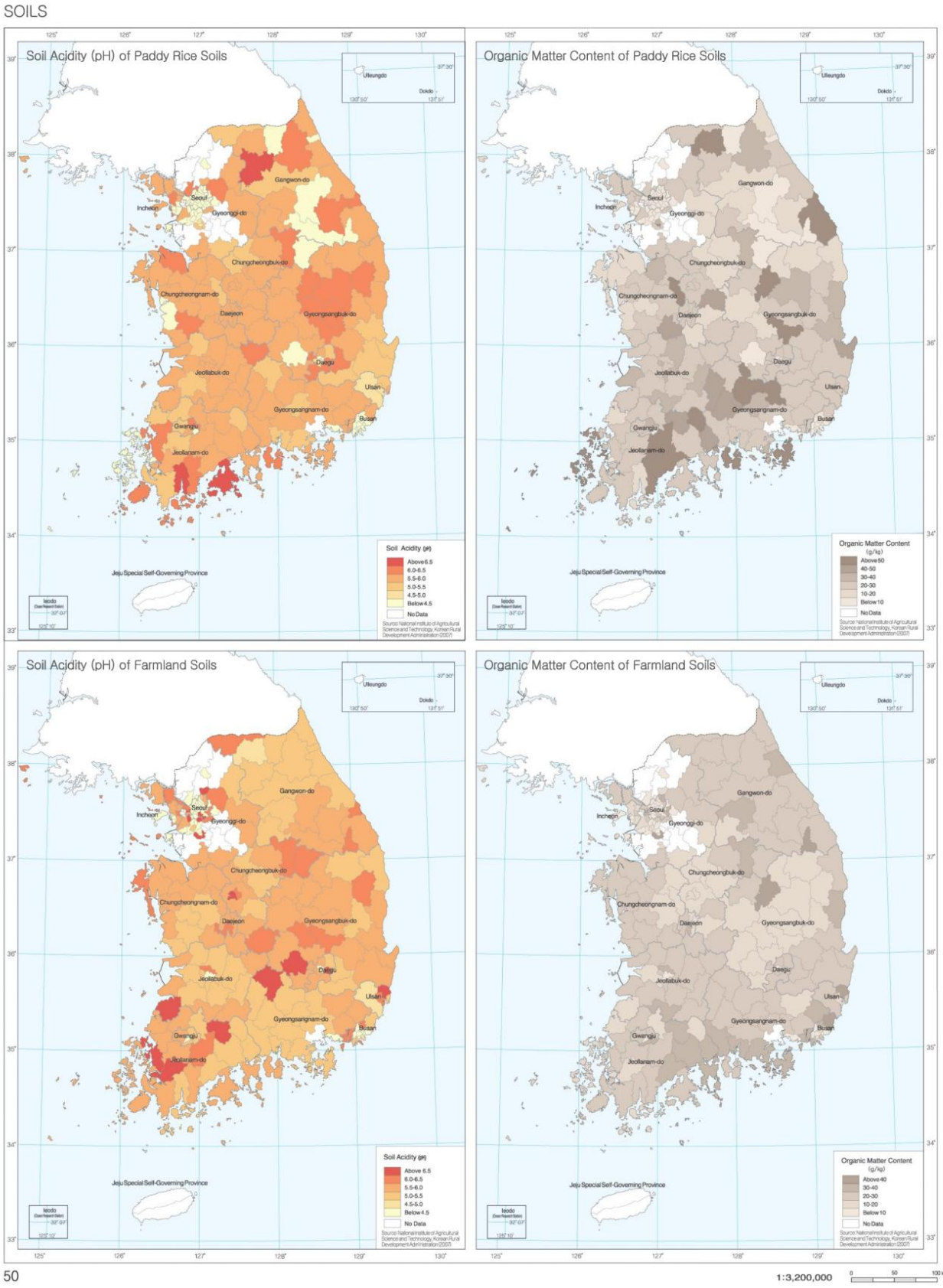


Fig. 21b. *Ph value and content of organic mater in soils*

in the volcanic islands as Jeju special self-go-verning province and Ulleungdo, Jeju do and Ulleung do, and show scattered occurrence on tertiary volcanic rocks at Gyeonggi-*do*, northern Gangwon-*do*, andsome parts of 'Taebaksanmaek and Sobaksanmaek'. Histosols are surveyed at Jeju special self-governing province and along the southern coast of Korea, covering less than 1% of the land. Mollidsols show a limited distribution at the southern part of Gangwon-*do*.

The distributions of six major great groups found in Korea are among Inceptisols, the occurrence of Dystrudepts, Eutrudepts, and Endoaquepts are 47.4%, 16.8%, and 10.0%, respectively. These soils have altered soil horizons that have lost bases or ironaluminum, but lacking illuvial features at subsurface soils.

Entisols do not have any soil horizons other than an "A" horizon. Because these soils have a weak capacity to retain moisture and nutrients, the utilization of these soils is limited.

Udorthents that have no characteristic soil horizons cover about 11.0% of the land, and are mainly found at rugged mountains such as thd Taebaeksanmaek, Sobaeksanmaek and the Jirisanmaeks (mountain ranges) see the fig. 22. tea plantation in South Korea located on mountainous terrain. Psamments are found at coastal sand dunes and sand deposits. Fluvents developed at tidal flats and Aquents formed at floodplains make up less than 2% of the land.

Rural settlements in Korea

Rural settlements in Korea's rapidly urbanizing society are no longer the self-sufficient, self-contained, closed systems of previous years. Although there may be some degree of difference, all the villages have become a part of the reorganized open system centered on major urban settlement systems. In this process, the new characteristics of rural settlements depend on the level of influence they receive from the central place. In the urbanization process, a massive migration of the Korean population to cities has taken place at the same time that out-migration from rural settlements has been occurring. Such a population exchange has brought changes in agriculture and in the entire rural economy. The typology ofthe migration determines the demographic, social and economic structure of rural settlementsand eventually each village becomes specialized according to its role related to the central city.

The rural settlements experience quantitativeas well as qualitative changes in agriculture and the agricultural labor force, in order torespond to the commerciality of the central market of their open systems. The opening of the Korean agricultural market to the world economy has also been one of the major contributingfactors to the structural changes of Korean rural settlements. The changes do not follow auniform pattern, but they vary depending on the influence of the central urban areas.

As a result, the economy of rural villages has become diversified and specialized. Traditional homogeneous farming communities have now converted into economically more diversified settlements. This is a phenomenon seen in the rural economy of de-industrialized societies andKorean rural settlements are no exception.

1) Diversification process of farming and fishing villages.

As Korea has moved toward being a de-industrialized society, rural settlements have evolved a new dimension. Spatial rearrangements of rural settlements now depend on the socioeconomic influence of the central city. The influence of the central cities varies depending on the accessibility to the city in terms of communication and transportation.

Accessibility to cities from rural settlements created a new epoch in the 1990 s and has allowed for tremendous improvements in rural spatial arrangements. First, in regard to the transportation network: continuous new construction and expansion of expressways has diminished the differences in regional accessibility that existed previously. Though limited in some rural areas, the opening of new express rails has improved accessibility between regions.

Primary and secondary highways have all been paved and major local highways have been widened, allowing most rural areas equal access to urban centers, as well as between regions.

Second, in regard to communication networking: rural information extension services have brought better accessibility to information. Provincial universities now have rural extension education services with all *guns* in the provinces and Chung-cheongbuk-*do* is the leader in programming. Such improvements in transportation and communication networkinghave allowed rural settlements to become nested within the hierarchies of higher order citiesin the Korean urban system.

At the same time, opening the agricultural product market to free trade has brought about major changes in rural settlements and their spatial organization. As competitors producing agricultural pro-ducts for the overseas market, the majority of Korean farmers who are smallscaleproducers can no longer compete and survive in the business. Agriculture in Koreacan no longer be the traditional subsistence farming to support families, but instead has taken thenew survival approach of becoming commercial farming with supplementary non-farmingincome.

Fig. 22. *Tea plantation in South Korea located on mountainous terrain*

Fig. 23. *Events related to the protection of soil from the advancing sands in South Korea*

Fig. 24. *Suspended sands occur on agricultural land*

In that sense, the close ties with central urban markets have become more crucial thanever for the survival of rural settlements.

Agricultural products of Korea

Korea with its four seasons, rich soil, pure water and diligent and conscientus farmers, produced clean and safe agricultural products.

Using managements techniques, farmers painstakingly cultivate their produce as if they were for their own family. In same way, we are committed with honesty and sincerity, to deliver the best agricultural products.

Using Korean Insam long been recognized was as the best Ginseng in the world. It has been cultivated for more than a thousand years. Compared to other Ginseng, its distinctive character lies in its effectiveness and superior quality. They are due to its optimal geographical conditions and its four distinct seasons. Korea is situated between 36 degrees and 38 degrees latitude. It has a long 180 day growing season, compared to the usual 120 to 130 days. Its ideal climate makes “Korea Insams” inner tissue firm and delicate, with a durable and unique scent. It has thirty kinds more saponin than other Ginseing in the world, which takes effect on detoxication, hemolysis or erythrocyte, and so on. It is thus reputed to be“ the best Ginseng among allin the world.

Several varieties of Ginseng

Soo-sam is four to five year old Ginseng freshly harvested from the field. It is the basic product from which every other kind of Ginseng is produced. It is heavy, as it has 70 to 80 percent liquid content.

Soo-sam has a yellow-white hue and has a distinctively well developed strong, stocky head and well developed legs and body.

Baek-sam is five to six year old Soo-sam that has been peeled and sun dried until the water content is reduced to under l4 percent. Its distinctive features are its beige color, strong legs and short, think head.

According to how it dries, Baek-sam is subdivided into Goksam and Bangoksam.

Hong-sam is six years old soo-sam that has been steam and dried eight times, leaving its skin intact.

This process extracts its impurities, leaving only its beneficial and effective ingredients, especially saponin.

It turns dark brown and amount of saponin increases during the drying process.

To produce Taegeuk-sam, Soo-sam is soaked in hot water until part of the body is gelatinized under the dried skin. It comes out light yellow and it retains its original upright shape. When sliced, the circle has a light brown tint, similar to Hong-sam.

Fig. 25. *Soo-sam*

Fig. 26. *Baek-sam*

Fig. 27. *Baek-sam*

To produce the purest and best quality ginseng, special care must be devoted to cultivation, from planting to harvesting. First, the field must be carefully selected in order to simulate thegrowing conditions of wild ginseng as closely as possible. After that, using broad-leaved trees found deep in the mountains, the proper soil is located and fertilized with compost for one ortwo years. This method enab-les the land to be suitable for the natural cultivation of ginseng.The next step is selecting the best seeds from a superior crop of ginseng and then transplanting the best seedlings. This is a prerequisite in producing premiere ginseng. Via thisprocess, superior ginseng is produced and the result 4-6 years later is the best pure ginseng, formed in the shape of the human body.

Fig. 28. *Taegeuk-Sam*

Fig. 29. *1st year*

Fig. 30. *2st year*

Fig. 31. *3st year*

Fig. 32. *4st year*

Fig. 33. *5st year*

Fig. 34. *6st year*

Ginseng Saponin is the main medicinal property in ginseng, otherwise known as ginsenoside.

This saponin is different from saponins in other plants in terms of chemical structure as well as efficacy. Saponins from Korean Insam so far include, by chemical structure, 19 types of Protopanaxadiol (PD), 10 types of Protopanaxatriol (PT), and 1 type of Oleanane, 30 in total, a number that is much more than American (13 types) or Sanchi (15 types) ginseng.

In addtion, Korean Insam contains other different ginsenosides with additional medical benefits such as Ra, Rf, Rg3, and Rh2 which cannot be found in American ginseng, resulting in a superior medical efficacy compared to other kinds of ginseng.

A product from six- year-old red ginseng manufactured by Cheong-Kwan-Jang is official brand of Korea Ginseng Corporation. Source (Korea Ginseng Corporation. Korea).

Source (Korea Agro-Fisheries Trade Corporation provides precise and up-to-date information on Korean agricultural products and its trade).

Fig. 35. *Plantation of ginseng in Korea*

Fig. 36. *Plantation of ginseng in Korea*

Fig. 37. *Plantation of ginseng*

Fig. 38. *A product from six-year-old red ginseng manufactured by Cheong-Kwan-Jang is official brand of Korea Ginseng Corporation. Source (Korea Ginseng Corporation. Korea)*

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