



Republic of Korea

Environmental Health Country Profile

World Health Organization

As of July 1, 2004

1 Development, Environment and Health Status

1.1 Development Pattern of the Country

1.1.1 Maps / geography / demography / urban-rural trends



Republic of Korea is situated on the Korean Peninsula, which spans 1,100 kilometers north to south. The Korean Peninsula lies on the northeastern section of the Asian continent, where Korean waters are joined by the western-most parts of the Pacific.

The total area of the peninsula, including its islands, is 222,154 square kilometers of which about 45 percent (99,600 square kilometers), excluding the area in the Demilitarized Zone (DMZ), constitutes the territory of South Korea

The population of the Republic of Korea as of 2003 was 47.9 million. The population density of the country is 490 persons per square kilometer.

Fast population growth was once a serious social problem in the Republic, as in most other developing nations. Due to successful family planning campaigns and changing attitudes, however, population growth has been curbed remarkably in recent years. The annual growth rate was 0.57 percent in 2003.

A notable trend in the population structure is that it is getting increasingly older. The 2003 population estimate revealed that 8.3 percent of the total population was 65 years old or over. The number of people in the age of 15-64 years accounted for 71.3 percent.

The nation's rapid industrialization and urbanization in the 1960s and 1970s has been accompanied by continuing migration of rural residents into the cities, particularly Seoul, resulting in heavily populated metropolitan areas. However, in recent years, an increasing number of people have begun moving to suburban areas of Seoul. The percent of urban population is 79.7% in 2004.

Under 5 mortality rate is 5 per 1000 live birth. Newborn infants weighing at least 2500g at birth is 96%.

1.1.2 General economy of the country

The Republic of Korea, once known as one of the world's poorest agrarian societies, has undertaken economic development in earnest since 1962. In less than four decades, Korea has achieved what has become known as the "economic miracle on the Han River (a river that runs through Seoul)," an incredible process that dramatically transformed the Korean economy while marking a turning point in the history of Korea.

An outward-oriented economic development strategy, which used exports as the engine of growth, contributed greatly to the radical economic transformation of Korea. Based on such strategy, many successful development programs have been implemented. As a result, from 1962 to 2003, Korea's Gross National Income (GNI) increased from US\$2.3 billion to US\$606.1 billion, with its per capita GDP soaring from US\$87 to about US\$12,646. These impressive figures clearly indicate the magnitude of success what these economic programs have brought about.

1.1.3 Development priorities

Korea has been rapidly integrating itself into the world economy since the onset of the 1997 Asian Financial Crisis. The government has advanced a new paradigm that involves upgrading business practices to international standards, promoting human resources and technology development and enhancing institutional efficiency.

1.1.4 Human Development Index

By the Human Development Index composed by the United Nations Development Program (Human Development Report 2004), the Republic of Korea ranks 28 out of 177 nations

1.2 *Existing Service Levels*

1.2.1 Proportion of population (national) with existing utilities (water supply, sanitation, solid waste collection, drainage, sewerage, electricity)

With an increasing demand to the clean environment, the Korean government enhanced its effort to improve the quality of the environment. As a result, the proportion of population covered by existing environmental facilities is increasing rapidly.

The proportion of population with access to the piped water was 89.4 percent (43,633 thousands out of 48,824 thousands) in 2003 which has increased from 82.9 percent in 1995. The percentage of population covered by sewerage treatment facilities increased from 45.4 percent in 1995 to 78.7 percent in 2003. Almost all of municipal solid wastes are collected and treated; 41 percent was landfilled, 14.5 percent was incinerated and 44.0 percent was recycled in 2002. 100 percent of the population is served with electricity.

1.2.2 Proportion of urban population served by piped water, sewers, electricity, municipal solid waste collection

The proportion of urban population served by the environmental facilities is much higher than that of rural population. For example, 96.4 percent of urban population can have access to piped water. Because of the way of collecting statistics, it is not possible to have the proportion of urban population with sewerage system, however the national coverage rate was 78.7 percent in 2003. The proportion of population which is covered by municipal solid waste collection service and electricity reaches 100 percent.

1.2.3 Presence of other basic services such as fire fighting and emergency management (flood, earthquake, chemical emergency, etc.)

Fire fighting and emergency management services are under the responsibility of the Ministry of Government Administration and Home Affairs (MOGAHA). In order to enhance the national capacity in the prevention, preparedness and response to the natural disasters, such as flood, the Korean government has launched the National Emergency Management Agency in 2004.

The prevention, preparedness and response to chemical accidents are under the responsibility of the Ministry of Environment (MOE). It operates the Center for Chemical Safety Management (CCSM) whose major tasks are the prevention, preparation and response to chemical accidents.

1.2.4 Housing: presence of building regulations, proportion of people living in informal settlements

In order to secure the safety of houses and buildings, the government has enacted several laws. The building act and the housing act are two major acts which designate regulations for the security of the buildings and housings. The proportion of people living in informal settlements is not available, but it is assumed that informal settlements are virtually non-existence.

1.2.5 Transport related: number of vehicles registered, number of motorcycles registered, rate (number per 100,000 population)

The number of registered motor vehicles in Korea have been increasing dramatically; from 527,729 vehicles in 1980 to 14,586,795 vehicles in 2003. Average annual increasing rate is about 19 percent. It is mainly because of continuous increase of disposable income and improved living standards, expansion of suburbs, and development of the car manufacturing industry. In particular, the increase rate of passenger cars was remarkable; from 249,102 in 1980 to 9,737,428 in 2003, more than 38 times. The number of other vehicles registered as of 2003 are 1,217,899 passenger/cargo combined cars, 3,054,688 trucks, and 46,342 special vehicles. The number of motor vehicles registered per 100 persons was 32 vehicles and 3.2 motorcycles in 2003.

1.2.6 Capacity for monitoring environmental quality (drinking water, water resources, ambient air, noise, radiation, etc)

The Ministry of Environment and its affiliates including local offices, the National Institutes of Environmental Research (NIER) and local governments monitor the national environmental quality. The monitoring includes drinking water quality, river and lake's water quality, ambient air quality, noise levels and radiations. The results of the monitoring are announced to the public periodically.

1.2.7 Capacity for data collection and processing

The Korean government manages not only centralized but also decentralized statistical system. As a centralized system, the National Statistical Office (NSO) plays a key role. It coordinates the national statistical services, compiles fundamental statistics and disseminates the integrated statistical information. The NSO is under the supervision of the Ministry of Finance and Economy

The government also manages decentralized statistical system. As far as the specific statistics are concerned, the ministries, in charge of the appropriate work areas, are responsible for their statistics. The Ministry of Environment produces, collects and compiles almost all environment related statistics. The Bank of Korea, which is in charge of the compilation of general financial and economic statistics, produces the statistics on national pollution abate cost expenditure.

1.3 *Environmental Quality*

1.3.1 Air pollution (percentage of population using solid fuels, proportion of vehicles using diesel and unleaded gasoline, frequency of exceeding national air quality standards)

The quality of air in Korea deteriorated in the 1970-80s due to rapid industrialization and urbanization. The rapid growth of car use also contributed to the deterioration of the ambient urban air quality. In order to secure clean air, the government introduced more stringent regulation to the air pollutant emission and expanded the supply of cleaner energy. The economic growth and increase of personal income induced increasing demand for cleaner energy. For example, domestic cooking or heating energy has been gradually replaced with cleaner energy; from briquette to LNG, electricity or petroleum etc. As a result, the proportion of population using solid/biomass fuels for cooking or heating was 3.4 percent in 2003.

Consequently, the ambient SO₂ concentration level becomes gradually lower. But because of the rapid increase of car use, especially diesel vehicles, O₃ and PM₁₀ became major air pollutants.

Proportion of vehicles using unleaded gasoline was 55 percent of all vehicles registered (No leaded gasoline can be used in Korea) and diesel vehicles constitutes 33 percent. The other 12 percent uses LP gas.

1.3.2 Water pollution (frequency of exceeding national water quality standards, drinking water quality standards)

Managing clean water in rivers, lakes has been major environmental policy targets in Korea. As a result, the Korean government has continuously increased investment on the sewage treatment facilities, drainage systems and industrial waste water treatment facilities. Recently, the Korean government introduced comprehensive water management measures for the four major river streams. ‘The act relating to water resources in Han River and community support’ and the special act on Nakdong River’s watershed management’ were enacted in 1999. Similar acts regulating Geum River and Yeongsan River’s watersheds were enacted in 2000.

Korea enforced stringent drinking water quality standards. As a result, proportion of monitoring sites which exceeded drinking water standards more than once per year is 0.6% at filtration plants, 0.4% at taps, 14.7% at mineral spring spots.

1.3.3 Solid waste (generation of municipal solid waste, proportion of recyclables)

With high population density and urbanization, the Korean government has difficulty in finding suitable sites for waste disposal. Hence, the government has tried to strengthen its effort to reduce waste generation as well as increase recycling. In Korea, domestic solid waste generated was 1.04 kg/per capita/day and 49,902 ton/day in 2003. Among them 44 percent were recycled and the amount reached 21,949 ton/day. Industrial general waste was generated 227,631 ton/day and 75.7 percent was recycled in 2002.

1.3.4 Hazardous waste (generation of toxic chemicals, hazardous materials, health-care waste, nuclear waste)

The generation of hazardous waste has been increasing at an annual rate of about 4 percent. The amount of hazardous waste generation was 7,985 tons/day in 2002. The treatment of the hazardous waste is under the strict regulation.

Health-care waste, which is classified into the infectious waste in Korea, has been managed by the MOE from 2000. Before then it was controlled by the Ministry of Health and Welfare (MOHW). The MOE levies strict regulation on the transportation and treatment of the infectious waste. To secure safer management of the infectious waste, the MOE is currently under the process of revising the regulation.

Nuclear waste is controlled by the Ministry of Commerce, Industry and Energy. Nuclear waste was generated about 6,588 ton in 2003.

1.4 *Public Health Statistics*

In recent years, the health and quality of life of Koreans have been improving steadily due to continued economic development and improvements in the public health and welfare system. In particular, major upgrading of public health and welfare standards are evident in the significant rise in life expectancy brought on by progress in medical services as well as expansion of

medical benefits through increased medical facilities and medical staff. These improvements have also greatly contributed to decreasing infant mortality rate and maternal mortality ratio.

Average life expectancy in the Republic of Korea for males rose from 51.1 in the 1960s to 72.8 in 2001 and for females from 53.7 to 80.0 over the same period. However, a high mortality rate for males in their 40s and 50s has led to a 7.5-year disparity in the average life expectancy of men and women. The infant mortality rate fell from 61.0 per 1000 live births in the 1960s to only 6.2 in 1999, while the maternal mortality ratio stood at 18 per 100,000 live births in 1999.

1.4.1 Ten leading causes of mortality and morbidity

Changes in socio-economic structure, life styles, and improvements of health and medical care, have drastically modified the causes of death. In the past, the main causes were acute and communicable diseases, but now they had been replaced with chronic and non-communicable diseases. As the elderly population grows and chronic degenerative disease increase, treatment-focused health care policies are being transformed into prevention-focused and health promotion policies. These improvements have greatly contributed to decreasing infant mortality rate and maternal mortality ratio.

Ten leading causes of mortality are cancer, cerebrovascular disease, cardiovascular disease, diabetes, suicide, liver disease, traffic accidents, chronic lower respiratory tract disease, hypertensive disease and falling.

Ten leading causes of morbidity are acute respiratory disease, arthritis, hypertension, back pain, gastritis and stomach ulcer, diabetes caries, disc herniation, allergic rhinitis, chronic rhinitis, eye disease. The order of the ten leading causes of morbidity was calculated on the basis of National Health and Nutrition Survey.

1.4.2 Diseases associated with agricultural and irrigation development (proportion of undernourished people, schistosomiasis, pesticide poisoning)

Peoples who take 75% of the recommended daily dietary allowance of energy, calcium, iron, vitamin a and riboflavin are 16.7% in Korea. Schistosomiasis is not endemic in Korea. However, there are high risk of hemorrhagic fever, tsutsugamushi and leptospirosis for farmers who work at the pasture. The data on the pesticide poisoning is not available in Korea.

1.4.3 Respiratory diseases related to outdoor air pollution from energy, transport and industry sectors

A comprehensive data on respiratory diseases related to outdoor air pollution are not available in Korea. A study, however, argued that the number of early death due to the fine particle pollution in Seoul would reach 1,053 which is 8 percent of the total death of the studied year. The study also argued that if the concentration of fine particle increases by $100\mu\text{g}/\text{m}^3$, 2~3% more death would incur.

1.4.4 Traffic crashes (mortality due to traffic accidents, rate: deaths /100,000 population, injuries due to traffic accidents, rate: injuries/100,000 population)

The number of registered vehicles and motorcycles are 14,585,795 and 1,730,193. Mortalities from car accidents are 31,618 which is 3,610 per 100,000 persons. The number of injuries due to traffic accidents is 348,184 which is 717.6 per 100,000 persons.

1.4.5 Diseases relating to poor housing (including pulmonary diseases, tuberculosis)

Tuberculosis is still important public health problem in Korea even though the housing environment, individual hygiene and nutrition state have been enormously improved. The number of tuberculosis which occurred in 2003 is 30,687. The prevalence of pulmonary tuberculosis is 1.0 % in Korea.

1.4.6 Water supply and sanitation-related diseases (such as diarrheal diseases, hepatitis, cholera, typhoid)

The number of dysentery which occurred in 2003 was 1117. The number of typhoid fever was 287. In case of cholera, the incident case was 1. The number of death due to diarrheal disease was 67.

1.4.7 Vector-borne diseases (such as malaria, plague, dengue fever and dengue hemorrhagic fever)

Malaria has occurred continuously since the outbreak of the late 90's. The number of malaria in 2003 was 1171 and 5 patients died due to malaria. Dengue and dengue hemorrhagic fever occurred 14 in 2003.

2 Legal, Policy, and Institutional Structure

2.1 Legislative and Policy Framework

2.1.1 National policies, plans or strategies for environmental health

There has not been comprehensive strategy or long-term planning on the environmental health in Korea. Currently, however, the MOE established the Environmental Health Policy Division (as of March 2004) and started to work on comprehensive study on environmental health. It includes a 10 year plan on Environmental health policy (2005~2014) and national surveillance on Environmental health etc.

2.1.2 Relevant legislation addressing environmental health issues (such as Public Health Act, Clean Air Act, environmental / health impact assessment)

In 2002, There are 47 environmental laws promulgated in 6 fields (water, air, solid waste, toxic chemicals/hazardous waste, health, others). In order to investigate the impact to the environment, the major development projects should be evaluated by the environmental impact assessment program before the project is implemented. The assessment includes 23 items in 3 major

environmental fields (natural environment, living environment, social or economic environment).
Current EIA does not include HIA.

Environmental/Health Acts promulgated (2002)

a. Water

- Water Supply Act,
- Water Quality Preservation Act,
- Act relating to Water Resources in Han River and Community Support
- Special Act on Nakdong River's Watershed Management
- Special Act on Geum River's Watershed Management
- Special Act on Yeongsan and Seomjin River's Watershed Management
- Drinking Water Management Act

b. Air

- Air Quality Preservation Act
- Act relating to Air Qualities in Underground space

c. Solid Waste

- Waste Management Act
- Compound Waste Treatment Corporation Act
- Korea Resource Recovery and Reutilization Corporation Act
- Act relating to Promotion of Resources Saving and Reutilization
- Act Promotion of Waste Treatment Facilities and Local Community

d. Toxic chemicals/Hazardous Waste

- Toxic Chemicals Control Act
- Act on the Control of Transboundary Movements of Hazardous Wastes and their Disposal

e. Health

- Public Health Control Act
- National Health Promotion Act
- Mental Health Act
- Regional Public Health Act
- Prevention of Contagious Diseases Act
- Prevention of Acquired Immune Deficiency Syndrome Act
- Tuberculosis Prevention Act
- Parasitic Disease Prevention Act
- Health and Medical Service Technology Promotion Act
- Food Sanitation Act
- Licensed Sanitarians Act
- Quarantine Act

f. Others

- Sewerage System Act
- Act relating to Protection of Birds, Mammals and Hunting
- Natural Park Act
- Environmental Pollution Prevention Corporation Act
- Environmental Management Corporation Act
- Basic Environmental Policy Act
- Noise and Vibration Control Act.. etc.

2.1.3 Decentralization and / or privatization policies dealing with environmental health

No data are available on this field.

2.2 *Institutional Structure for Environmental Health*

2.2.1 Administrative / organizational set-up of the country (at all levels or as appropriate)

On March 2004, MOE established the Environmental Health Policy Division (EHPD). The division is preparing a strategy on the national capacity building on environmental health. And the Environmental Epidemiology Division in the NIER is working with EHPD.

2.2.2 Role of government, private sector, non-government organizations, international organizations and partnerships in environmental health

A comprehensive study on this area has not been carried out yet.

2.2.3 Agencies involved and their respective functions (or in a table matrix)

2.3 *Relevant International Conventions and Agreements Ratified or Signed*

3 Human Resources Development Programs: Refer to EHDS 3.

3.1 *Environmental health workforce, professionals and their skills*

3.2 *Formal and informal training programs for environmental health*

3.3 *Government certification*

3.4 *Professional associations*

4 Priority Environmental Health Issues (by sector)

A study will be carried out to designate the priority in environmental health issues.

4.1 *Agriculture Sector* such as pesticide poisoning, irrigation runoff laden with fertilizer and pesticides, contamination of water resources, pesticide residues on vegetables

4.2 *Energy Sector* such as air pollution, noise, thermal pollution, fly ash and sludge disposal, nuclear wastes

4.3 *Industry Sector* such as air and water pollution, chemical emergencies, hazardous waste management

4.4 *Transport Sector* such as road safety, traffic crashes, ambient air pollution, noise

4.5 *Urban /Rural Development Sector* such as water supply systems, sanitary facilities, sewerage system, safe and adequate drinking water, solid waste management, drainage and flood control, good housing design and location, safe recreational waters

4.6 *Cross-cutting issues* such as health care waste, infectious / communicable diseases, vector-borne diseases, effects of climate change

5 Areas Requiring Improvement

A study will be carried out to identify areas requiring improvement.

- 5.1 *Specific policies and legislation for environmental health* (where absent in the country)
- 5.2 *Institutional development and intersectoral collaboration* (strategies forging partnerships)
- 5.3 *Human resources development* (especially preparedness and response)
- 5.4 *Monitoring and surveillance* (including management of information)
- 5.5 *Integration of health and environment in international/regional agreements*
- 5.6 *Others*

References (complete citations)

IEA “Key World Energy Statistics”(2002)

Korean National Statistical Office. (2004). “Electronic references”. Retrieved October 3 2004, from <http://kosis.nso.go.kr/>

Korean Statistical Information System(KOSIS). “Electronic references”. Retrieved October 3 2004 from <http://kosis.nso.go.kr/>

Human Development Report 2004 .

Environment White Paper 2003

Green Korea 2003

Environmental Statistics Yearbook 2003

NHNS: National Health and Nutrition Survey 2001

Appendix

Environmental Health Data Sheet
[Republic of Korea]
As of July 1, 2004

* NA : Not Available

	INDICATORS	DATA	Year	Source
1	Development, Environment and Health			
1.1.1	Area (1000 km ²)	99.6	2003	KOSIS
1.1.1	Estimated population ('000)			
	- Total	47,925	2003	KOSIS
	- Male	24,126	2003	KOSIS
	- Female	23,799	2003	KOSIS
1.1.1	Annual population growth rate (%)	0.57	2003	KOSIS
	Percentage of population			
	- 0-14 years			
	> Total	20.0	2004	KOSIS
	> Male	21.0	2004	KOSIS
	> Female	19.0	2004	KOSIS
	- 65+ years			
	> Total	8.7	2004	KOSIS
	> Male	6.8	2004	KOSIS
	> Female	10.5	2004	KOSIS
1.1.1	Urban population (%)	79.7	2004	KOSIS
1.1.1	Adult literacy rate (%)			
	- Both sexes	2.2	2003	IMD
	- Male	NA		
	- Female	NA		
1.1.1	Under-five mortality rate (per 1000 live births)	5	2001	UNICEF
1.1.1	Newborn infants weighing at least 2500g at birth (%)	96	2003	KOSIS
1.1.2	General economy: narrative report (separate sheet)			
1.1.2	Per capita GDP at current market prices (US\$)	12,646	2002	KOSIS
1.1.2	Total health expenditure on health as % of GDP	5.9	2001	OECD Health
1.1.3	Development priorities: narrative report (separate sheet)			
1.1.3	Land area for agriculture (as percentage of total land area)	18.5	2003	KOSIS
1.1.4	Human development index (Highest = 1)	0.888	2002	UNDP
	Human development index Rank (out of 175 countries)	28	2002	UNDP
1.2.1	Population with access to safe water (%)		2003	Environment white paper
	- Total	89.4		
	- Urban	96.4		

	INDICATORS	DATA	Year	Source
	- Rural	33.0		
1.2.1	Population with adequate excreta disposal facilities (%) : Population with sewerage treatment		2003	Statistics of Sewerage
	- Total	78.7		
	- Urban	NA		
	- Rural	NA		
1.2.1	Solid waste collection (% of total waste generated)	100	2003	MOE
1.2.1	Proportion of urban population served by municipal solid waste collection (%)	100	2003	
1.2.2	Proportion of urban population served by sewerage system (%) National or major city	NA		
1.2.1	Proportion of population with electricity (%)	100.0	2002	Korea Electric Power Corporation
1.2.2	Total	100.0		
	Urban	100.0		
	Rural	100.0		
1.2.3	Poison center service (Y/N list, year)	NA		
1.2.3	Chemical emergency preparedness (Y/N list, year) a. Designation of the chemicals should be specially managed to prevent and respond to chemical accidents - yes b. Existence of regulations demanding industry to prepare self-prevention plans in order to prevent chemical accidents and minimize damage – yes c. existence of national and local plans for responding to chemical accidents – yes d. Presence of professional staffs to respond to chemical accidents - yes e. Establishment of educational and research institutions for preventing chemical accidents – yes f. Presence of adequate systems for offering response information in case of a chemical accident – yes g. Presence of medical institutions in charge of treating the injured by chemical accidents – no	Yes Refer to left	2003	MOE
1.2.4	Proportion of population living in informal settlements (%)	NA		
1.2.4	Presence of building regulations and inspection (Y/N list, year) - Building act - Housing act	Yes Refer to left	2004	Ministry of Construction & transportation
1.2.5	Number of registered vehicles	14,586,795	2003	KOSIS
	Rate (number per 100,000 population)	31,618	2003	KOSIS
	Number of registered motorcycles	1,730,193	2003	KOSIS

	INDICATORS	DATA	Year	Source
	Rate (number per 100,000 population)	3,610	2003	KOSIS
1.2.6	Presence of government/private laboratories and equipment for monitoring		2003	
	Drinking water (Y/N; G/P)	Yes (G/P)		KOSIS
	Water resources (Y/N ; G/P)	Yes (G/P)		KOSIS
	Ambient air (Y/N ; G/P)	Yes (G/P)		KOSIS
	Noise (Y/N ; G/P)	Yes (G/P)		KOSIS
	Radiation (Y/N ; G/P)	Yes (G/P)		KOSIS
1.2.7	Presence of government/private system for data collection and processing (Y/N; G/P)	Yes(G/P)		KOSIS
1.3.1	Proportion of population using solid/biomass fuels for cooking or heating (%)	3.4	2003	Statistics of Commerce, Industry and Energy
1.3.1	Proportion of vehicles using diesel (%)	33	2003	KOSIS
1.3.1	Proportion of vehicles using unleaded gasoline (%)	55	2003	
	Proportion of vehicles using LP gas (%)	12		
1.3.1	Average number of times national air quality standards are exceeded in a year : Proportion of monitoring sites which exceeds national air quality standards a. short-term (1-hour) frequency: Proportion of the sites which exceed national air quality standards (%) b. long-term (8-hour) frequency: Proportion of the sites which exceed national air quality standards (%)	SO ₂ : 0.6 NO ₂ : 0.0 O ₃ : 21.3 CO : 0.0 PM ₁₀ : 0.0 Pb : 0.0 SO ₂ : 1.2(24h) NO ₂ : 4.9(24h) O ₃ : 79.3 CO : 0.0 PM ₁₀ : 93.9(24h) Pb : 0.0	2002	Annual Report of Air Quality in Korea
1.3.2	Average number of times national water quality standards are exceeded in a year a. In four major rivers: we do not keep these statistics, though we can provide the quantity of waste water discharge (m ³ /day) Hangang 308,902, Nakdonggang 516,142, Geumgang 198,138, Yeongsangang 23,674 b. In major drinking water supplies : Proportion of points standards are exceeded more than once per year(%) Filtration plant 0.6, tap 0.4, mineral spring spot 14.7 provisional water-supply system 4.9,	Refer to left	2003 2002	MOE, "Statistics of Water Quality"
1.3.2	Industries generating wastewater (number)	53,851	2003	
1.3.3	Solid waste generated (kg/per capita/day) : Domestic waste	1.04	2002	MOE,

	INDICATORS		DATA	Year	Source	
1.3.3	Solid waste generated (tons per year) : General waste(Domestic waste and Industrial non-hazardous waste)		98,385,020		“Environment al Statistics Yearbook”	
1.3.3	Proportion of recyclable solid waste (%) : Average proportion of 14 recyclable item *14 recyclable item : paper cup, metal can, glass bottle, synthetic resin, lubricant oil, tire, silver oxide cell, lithium battery, nickel-cadmium battery, television, a refrigerator, washing machine, air conditioner, computer		31.6	2003	Resource Recycling Division, MOE	
1.3.4	Toxic and hazardous wastes generated (tons/year)		2,914,525	2002	MOE, “Environment al Statistics Yearbook”	
1.3.4	Industries generating toxic and hazardous wastes (number)		72,879	2002	MOE, “2002 Toxic and hazardous wastes generation, handling”	
1.3.4	Health-care waste generation (tons per year)		33,981	2002		
1.3.4	Nuclear waste generation (tons per year) : Nuclear waste store		6,588	2003	Statistics of Commerce, Industry and Energy	
1.4.2	Cases of pesticide poisoning (number)		NA			
1.4.2	Proportion of undernourished population (%)		. NA			
1.4.2	Prevalence of underweight children under five years of age (%)		NA			
1.4.4	Motor and other vehicle injuries (number)		348,184	2002	KOSIS	
1.4.4	Road traffic crashes:					
	Number of accidents (within a year)		230,953	2002	KOSIS	
	Rate (Accident per 100,000 population)		484.8	2002	KOSIS	
	Rate (Accident per 10,000 vehicle registration)		165.6	2002	KOSIS	
	Rate (Injuries per 10,000 vehicle registration)		249.6	2002	KOSIS	
	Rate (deaths per 100,000 population)		14.6	2002	KOSIS	
1.4.1- 1.4.7	Ten leading causes of morbidity		Number	Rate per 100 000 population		
	1. Acute respiratory disease		4,152,222	8,664	2001	NHNS
	2. Arthritis		2,800,258	5,843	2001	NHNS
	3. Hypertension		2,248,641	4,692	2001	NHNS
	4. Back pain		1,664,915	3,474	2001	NHNS
	5. Gastritis and stomach ulcer		1,408,037	2,938	2001	NHNS

	INDICATORS		DATA	Year	Source
	6. Diabetes	1,005,467	2,098	2001	NHNS
	7. Caries	771,113	1,609	2001	NHNS
	8. Disc herniation	755,777	1,577	2001	NHNS
	9. Allergic rhinitis, chronic rhinitis	747,150	1,559	2001	NHNS
	10. Eye disease	626,859	1,308	2001	NHNS
1.4.1- 1.4.7	Ten leading causes of mortality	Number	Rate per 100 000 population		
	1. Cancer	64,322	131.8	2003	KOSIS
	2. Cerebrovascular disease	36,495	75.5	2003	KOSIS
	3. Cardiovascular disease	17,188	35.6	2003	KOSIS
	4. Diabetes	12,100	25.0	2003	KOSIS
	5. Suicide	10,932	24.0	2003	KOSIS
	6. Liver disease	9,934	20.6	2003	KOSIS
	7. Traffic accidents	9,224	19.1	2003	KOSIS
	8. Chronic lower respiratory tract disease	9,213	19.1	2003	KOSIS
	9. Hypertensive disease	5,149	10.7	2003	KOSIS
	10. Falling	3,519	7.3	2003	KOSIS
		Number of cases	Number of deaths		
1.4.5	Tuberculosis (All types)	30,687	3,331	2003	KOSIS
1.4.5	Rheumatic fever and rheumatic heart diseases	-	327	2003	KOSIS
1.4.6	Acute respiratory infections	-	316	2003	KOSIS
1.4.6	Hepatitis viral	-	828	2003	KOSIS
1.4.6	Cholera	1	0	2003	KOSIS
1.4.6	Typhoid fever (and paratyphoid fever)	287	0	2003	KOSIS
1.4.6	Encephalitis	1	0	2003	KOSIS
1.4.6	Diarrhoeal diseases	-	67	2003	KOSIS
1.4.7	Plague	-	0	2003	KOSIS
1.4.7	Malaria	1,171	5	2003	KOSIS
1.4.7	Dengue/DHF	14	0	2003	KOSIS
	INDICATORS		DATA	Year	Source
2	Legal, Policy, and Institutional Structure				
2.1.1	National environmental health policy (Y/N list, year)		No		
2.1.1	National environmental policy (Y/N list, year) - Development and Promotion of Environmental Technology - The Environmental Industry - Environmental Education - Nature conservation		Yes Refer to left	2003	Green Korea 2003

	INDICATORS	DATA	Year	Source
	<ul style="list-style-type: none"> - Conservation of Atmosphere - Special Measures for the Four Major Rivers - Safe & Sanitary Water Supply - Structuring of Resources-Recycling Society - Management of Chemical Substances 			
2.1.1	<ul style="list-style-type: none"> Policies/legislation to reduce exposure to environmental tobacco smoke (Y/N list, year) - Designation of non-smoking area - Activities related with public anti-smoking campaign 	<p style="text-align: center;">Yes Refer to left</p>	2002	MOHW
2.1.1	<ul style="list-style-type: none"> National policies for healthy settings (such as healthy cities) (Y/N list, year) - Green city award(start in 2004) 	<p style="text-align: center;">Yes Refer to left</p>	2004	MOE
2.1.2	<ul style="list-style-type: none"> Environmental/Health Acts promulgated: (Y/N list, year) a. Water <ul style="list-style-type: none"> - Water Supply Act, - Water Quality Preservation Act, - Act relating to Water Resources in Han River and Community Support - Special Act on Nakdong River's Watershed Management - Special Act on Geum River's Watershed Management - Special Act on Yeongsan and Seomjin River's Watershed Management - Drinking Water Management Act g. Air <ul style="list-style-type: none"> - Air Quality Preservation Act - Act relating to Air Qualities in Underground space h. Solid Waste <ul style="list-style-type: none"> - Waste Management Act - Compound Waste Treatment Corporation Act - Korea Resource Recovery and Reutilization Corporation Act - Act relating to Promotion of Resources Saving and Reutilization - Act Promotion of Waste Treatment Facilities and Local Community i. Toxic chemicals/Hazardous Waste <ul style="list-style-type: none"> - Toxic Chemicals Control Act - Act on the Control of Transboundary Movements of Hazardous Wastes and their Disposal j. Health <ul style="list-style-type: none"> - Public Health Control Act - National Health Promotion Act - Mental Health Act - Regional Public Health Act - Prevention of Contagious Diseases Act - Prevention of Acquired Immune Deficiency Syndrome Act - Tuberculosis Prevention Act 	<p style="text-align: center;">Yes Refer to left</p>	2003	Green Korea 2003

	INDICATORS	DATA	Year	Source
	<ul style="list-style-type: none"> - Parasitic Disease Prevention Act - Health and Medical Service Technology Promotion Act - Food Sanitation Act - Licensed Sanitarians Act - Quarantine Act k. Others <ul style="list-style-type: none"> - Sewerage System Act - Act relating to Protection of Birds, Mammals and Hunting - Natural Park Act - Environmental Pollution Prevention Corporation Act - Environmental Management Corporation Act - Basic Environmental Policy Act - Noise and Vibration Control Act.. etc. 			
2.1.2	<p>Environmental impact assessment as an official requirement (Y/N list, year)</p> <ul style="list-style-type: none"> o assessment item <ul style="list-style-type: none"> a. Nature environment field <ul style="list-style-type: none"> - atmospheric phenomena, - topography & nature of soil - animals and plants - ocean environment - irrigation b. Living environment field <ul style="list-style-type: none"> - land utilization - air - water(surface, subsurface) - soil - waste - noise & vibration - bad smell - electric wave obstacle - sunshine obstacle - view - hygiene and public health c. Society and Economy field <ul style="list-style-type: none"> - population - residence - industry - public facilities - education - transportation - cultural assets 	Yes Refer to left	2004	Environmental Impact Assessment Act on Environment, Transportation and Natural Disaster
2.1.2	Health impact assessment as part of EIA (Y/N list, year)	No		
2.1.3	Policies for decentralization such as for environmental health and monitoring (Y/N list, year)	No		
2.1.3	Policies for privatization such as for environmental health and monitoring (Y/N list, year)	No		
2.2.1	Organizational structure for environmental health (separate sheet)	-		
2.2.2	List of agencies and partners for environmental health other than government (separate sheet)	-		
2.2.3	List of government agencies and their functions (separate sheet as a table matrix)	-		
2.3	<p>Relevant international conventions/agreements (List, year signed/ratified)</p> <ul style="list-style-type: none"> - POPs convention was signed in 2004 and will be ratified by 2005 - PIC convention was signed and ratified in 2004 	Refer to left	2004	MOE
	INDICATORS	DATA	Year	Source

	INDICATORS	DATA	Year	Source
3	Human Resources Development Programs			
3.1	Environmental Health workforce			
	- environmental health officers : need more clear definition			
	- health/sanitary inspectors : personnel in health center and sub-health center	18,377	2001	MOHW
	- assistant sanitarians	NA		
	- environmental engineers	89,436	2002	MOE, “Envirnment al Statistics Yearbook”
	- sanitary engineers	29,987	2004	MOHW
	- pollution control officers	1,768	2004	MOE *local gov’t officers are not included
	- others	-		
3.2	Tertiary degrees related to environmental health (Y/N list) - 18 universities / graduate school	Yes	2004	Ministry of Education & Human Resources Development
3.2	Short courses and duration related to environmental health (Y/N list) - 6 colleges	Yes	2004	
3.3	Government certification for environmental workforce (Y/N list) : Technician, Environment engineer, Environment industry engineer	Yes	2002	MOE, “Envirnment al Statistics Yearbook”
3.4	Professional associations related to environmental health (Y/N list, memberships) Korean Society of Environmental Health, etc	Yes Refer to left	2004	MOE
3.4	International associations’ local affiliates (Y/N list, memberships)	No		
	INDICATORS	DATA	Year	Source
4	Priority Environmental Health Issues			
4.1	Soil erosion (mm/year)	NA		
4.1	Fertilizer consumption (metric tons/year)	2,858	2003	Korea Fertilizer Industry Association
4.1	Pesticide consumption (metric tons/year)	7,909	2003	Korea Crop Protection Association
4.1	Banned pesticides used (number)	0	2004	
4.1	Water resources withdrawal for irrigation (annual withdrawal as percentage of total water resources)	NA		

	INDICATORS	DATA	Year	Source
4.1	Irrigated agricultural area (1000 ha)	1,138	2002	An annual report of agricultural and forestry statistics
4.2 -4.6	Inputs from Chapter 1			
4.6	Carbon dioxide emissions (per capita metric tons)	9.48	2002	IEA, "Key World Energy Statistics"
4.6	Consumption of ozone-depleting CFCs (ODP metric tons)	6,646	2002	Korea Specialty Chemical Industry Association

ATTACHMENTS
Reference