2011-2015
National Strategy for Sustainable Development

August 2011

Republic of Korea

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Chapter 1. Introduction

Ⅰ Background and Progress

1. Background

a. Conceptual Paradigm shift of Sustainable Development

□ Today, the world faces scarcity of natural resources due to the recent economic and population growth and environmental challenges caused by climate change.

○ Imbalance between limited natural resources and demand causes not only environmental and ecological damages, but also direct anthropogenic challenges.

□ In 2007, the United Nations General Assembly identified the negative impacts of climate change on sustainable development and its major pending issues.

○ UNCSD and IPCC clearly state that mitigation and adaptation plans for climate change should be included as national sustainable development strategies.

□ Sustainable development has widely been understood as a concept that emphasizes environment on top of harmonized balance between the survival of human race and development.

○ Based on maintaining a healthy ecological condition, the concept of development has been treated as a key concept of economic growth and a tool for social and individual development.

b. International Agreement

□ Resolution of Rio meeting in 1992, Brazil

○ Agenda 21 has been selected in order to underline the importance of sustainable development and to facilitate the launch and implement the national strategic plans.

□ Resolution of Johannesburg World Summit on Sustainable Development (WSSD) in 2002

○ To achieve sustainable development, Johannesburg implementation plan was prepared to recommend all countries to take prompt tasks in the formulation and elaboration of the NSSD. The member states have agreed to begin their implementation by 2005.

□ As of 2009, 106 countries established national strategy for sustainable development (NSSD)

○ The Republic of Korea finalized the formulation and announced the 1st NSSD in October, 2006.

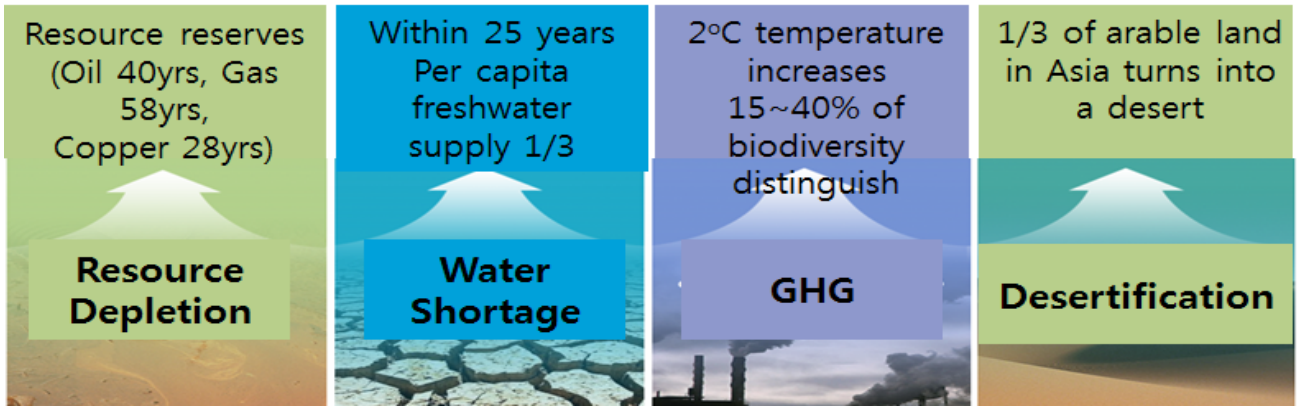
2. Progress of NSSD

Period	Main Events
2006.10	▪ Establishment of the 1st NSSD (2006~2010) - 4 Strategies, 48 Implementation Plans, 238 action plans
2010.11	▪ Settlement of the 2nd NSSD draft - related research by Korea Environment Institute (2009.9～2010.11)
2010.11 ~2011.6	▪ Agreement between related departments - Ministry of Strategy and Finance, Ministry of Knowledge Economy, Ministry of Land, Transport, and Maritime Affairs, Ministry of Health and Welfare, etc., for opinion gathering
2010.12 ~2011.5	▪ Advanced review by the Sustainable Development Committee - Comprehensive Plan (Draft) through pre-review - 4 professional committee and detailed review - Disagreement over the pre-meeting adjustments
2011.6	▪ Sustainable Development Commission vote for deliberation - 4 strategies, 25 implementation plans, 84 action plans
2011.7	▪ Green Growth Committee vote
2011.8	▪ Cabinet Council vote for deliberation

II Status Analysis of Sustainable Development

1. External Analysis

□ Industrialization, which brings about reduced capacity of natural resource supply and environmental pollution, is a threat to the substantiality of global environment and human race.



〈Global Issues and Environmental Crisis That Hinder Sustainable Development〉

□ **Paradigm shift in development**

○ There has been transition from land and environmental commitment of natural resources to the qualitative growth strategy.

○ As sustainable development has been embodied to that which includes negotiations for climate change, it has become the central axis of international relations and economic activities.

○ As a new development paradigm, UNCSD has conducted numerous programs.

- Since 2004, it has established 29 selected fields that includes water, biodiversity, energy, climate change; conducts intensive discussion every 2 years and draws up implementation methods for these programs.

□ The major industrialized countries, through environment as the major driver, establish comprehensive response strategy to strengthen the linkage between economic and social sectors.

2. Internal Analysis

□ Lack of strategic liaison between environmental problems and new growth engines

○ There is lack of efforts to establish policies that can use climate change, environmental regulation reinforcement in developed countries, and demands for high quality of life as a new growth engines.

○ With slow implementation of sustainable development, due to population reduction, population aging, polarization of wealth; an adverse impact is expected on developing a new growth engine.

□ **Low quality of life**

○ The quality of life the public at large is perceived to be of low level while the demand for improvement in the future is increasing.

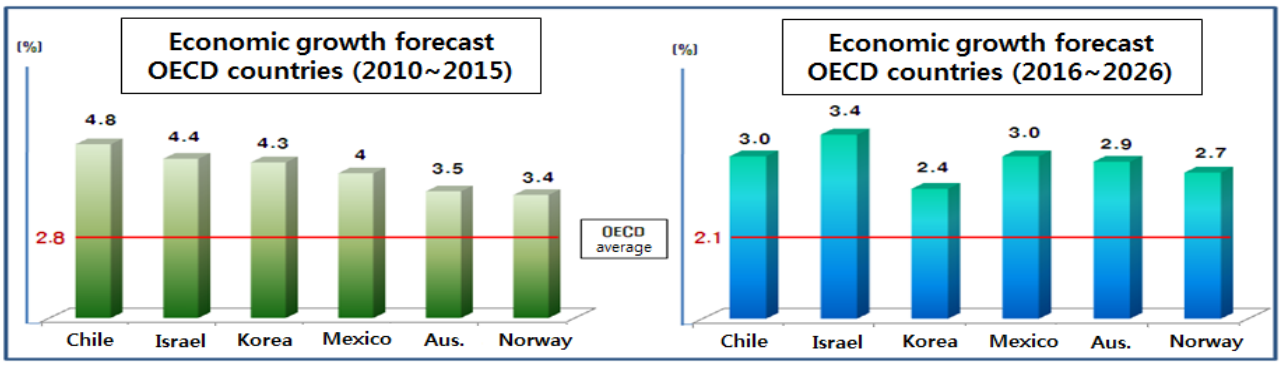
- According to the World Research (2007.4) on satisfaction level of quality of life, 41% of individuals, and 30.8% of the whole society were observed, and demand for its improvement was 71.8% of individuals and 56.6% of the whole society.

○ Low quality of life has negative effects on national competitiveness

※ Social and environmental costs of metropolitan area (2002): Traffic congestion costs 12.4 trillion won (56.1 percent of the country) and air pollution costs 10.4 trillion won (environmental disposal costs 4.2 billion)

□ **Domestic Environmental Outlook**

○ It is expected that the lower economic growth rate of the 20th century would continue. Therefore, it is difficult to expect high growth rate.

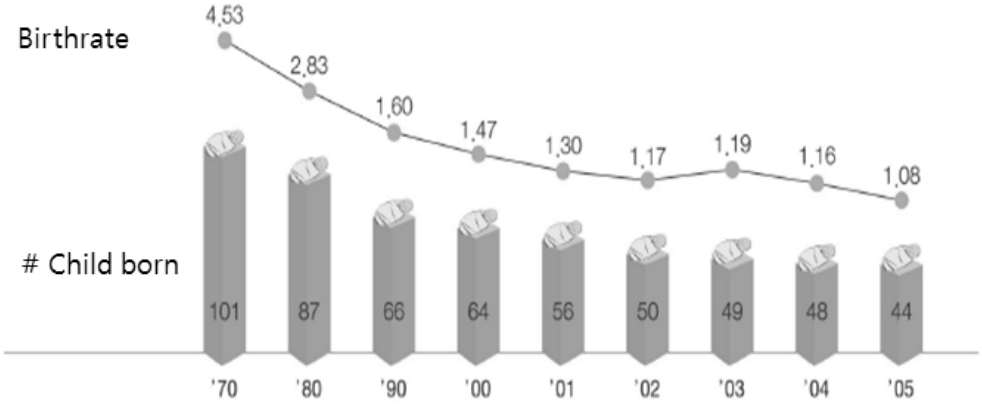


〈OECD Report on Economic Outlook (2011.5)〉

○ Korea's fertility rates is the world's lowest with 1.08% (2005) and after 2020, the population will presumably decline.

- In 2000, Korea has already became an elderly society (7% of population are the elderly). Korea is expected to be an extremely aged society by 2026 (20%), and the world's oldest country by 2050 (37.3%).

※ The aging index of Korea in 2005 was 47 (90 for developed countries) The index is anticipated to be 126 in 2020 (118 for developed countries) and 214 in 2030 (148 for developed countries) (Statistics Korea, 2007)



〈Birthrate and number of child born〉

○ Due to yellow dust, global warming and climate change that causes increase in fine dust, localized heavy rains and drought, there is an increase industrial damage which includes low level of productivity and material damage.

※ Annual damage of seven trillion Korean won from yellow dust and more than 70% of industrial sectors are affected from the weather conditions (US Department of Commerce report)

○ There is an international trend where environmental regulations are used to increase national competitiveness and reinforce sustainable development strategies.

- Due to natural resource import and export regulations, rising raw material prices cause adverse effects on Korean economic growth.

※ As in the case of EU REACH (chemicals management regulations), the registration and regulations on the use of chemicals affect all industries and the related chemical industry to generates an additional cost of 2.5 trillion won.

III Evaluation Results of 1st NSSD

1. Assessment Results

□ In order to check the implementation of 2009.12, the first National Strategy for Sustainable Development (2006-2010), the evaluation for sustainable development indicators of 77 countries was conducted.

○ By 2006.10, the first NSSD was established and 77 substantiality indicators was selected.

□ As a result, the expansion of economic and social infrastructure generated the economic and social improvement, which are considered quantitative growth, but poor income distribution and social equity were also observed.

○ Average longevity, water supply and sewage, renewable energy consumption rate, and public transportation number increase, and working hours and natural disasters decrease which shows the significant quantitative growth.

○ Energy consumption and greenhouse gas emissions, and density of population in the Seoul Metropolitan area, poverty rate, and the ratio of full-time workers' wage to non-regular workers' wage increase, and the area of forest and mud flat decrease, which show social equity and environmental resource index decline.

2. Policy Implications

□ To improve social equity and social integration, practical policies need to be applied.

○ Policies for increasing incomes of vulnerable communities, stabilizing housing, promoting public health and creating jobs policies are required.

□ Economic growth, energy and land environments that rely heavily on the commitment of resources requires a new growth paradigm.

○ Sustainable development strategies that focused on qualitative growth rather than quantitative growth are necessary.

IV Framework of 2nd NSSD

1. Legal Basis and Scope

a. Legal basis : Article 50 of 「Framework Act on Low Carbon, Green Growth」

b. The Scope

□ The Structure of the NSSD consists of the domestic and foreign conditions and anticipation, vision and prospects, strategies and implementation tasks, detailed implementation issues, national indicators on sustainable development.

□ It contains response and adaptation to climate change, the industrial economy, society and public health, 4 strategies in land and environmental sectors, 25 implementation tasks, and 84 detailed tasks.

○ Considering social equity, and strengthening the substantiality of land and environmental resources are derived key challenges.

c. Main Objectives

□ **Equity**

○ All people who live in the same period have a right to have the equal distribution and the quality of life.

□ **Balance between development and conservation**

○ Balance between economic development and environmental conservation should be considered.

□ **Ecological equity**

○ In the process of securing inter-generational equity, the harmony between nature and human race and improvement in quality of life needs to be considered first.

2. The Significance of NSSD

□ As the 1st period of NSSD (2006-2010) draws to an end, a subsequent strategy needs to be established.

○ The 1st NSSD concentrated on integration between the development environment preservation, eco-friendly economic structure, and established 4 strategies, 48 performance tasks and 238 detailed implementation projects.

□ Systematic management for national sustainable development

○ Establishing NSSD in accordance with vision and strategy, implementation plans and sustainable development indicators, etc. and managing national sustainable development in terms of implementation and evaluation of sustainable development performance.

○ Through the economic and social policies based on the principles of sustainable development, practical social integration and national development goals can be pursued.

- Assessment of the substantiality of national development strategies.

□ Use the policy guidelines at local, national, regional and global level

○ The national strategies should meet the sustainable economic growth and global response to climate change of the 21st century.

○ It should be an integrated and coherent long-term policy framework for the national policy and planning level.

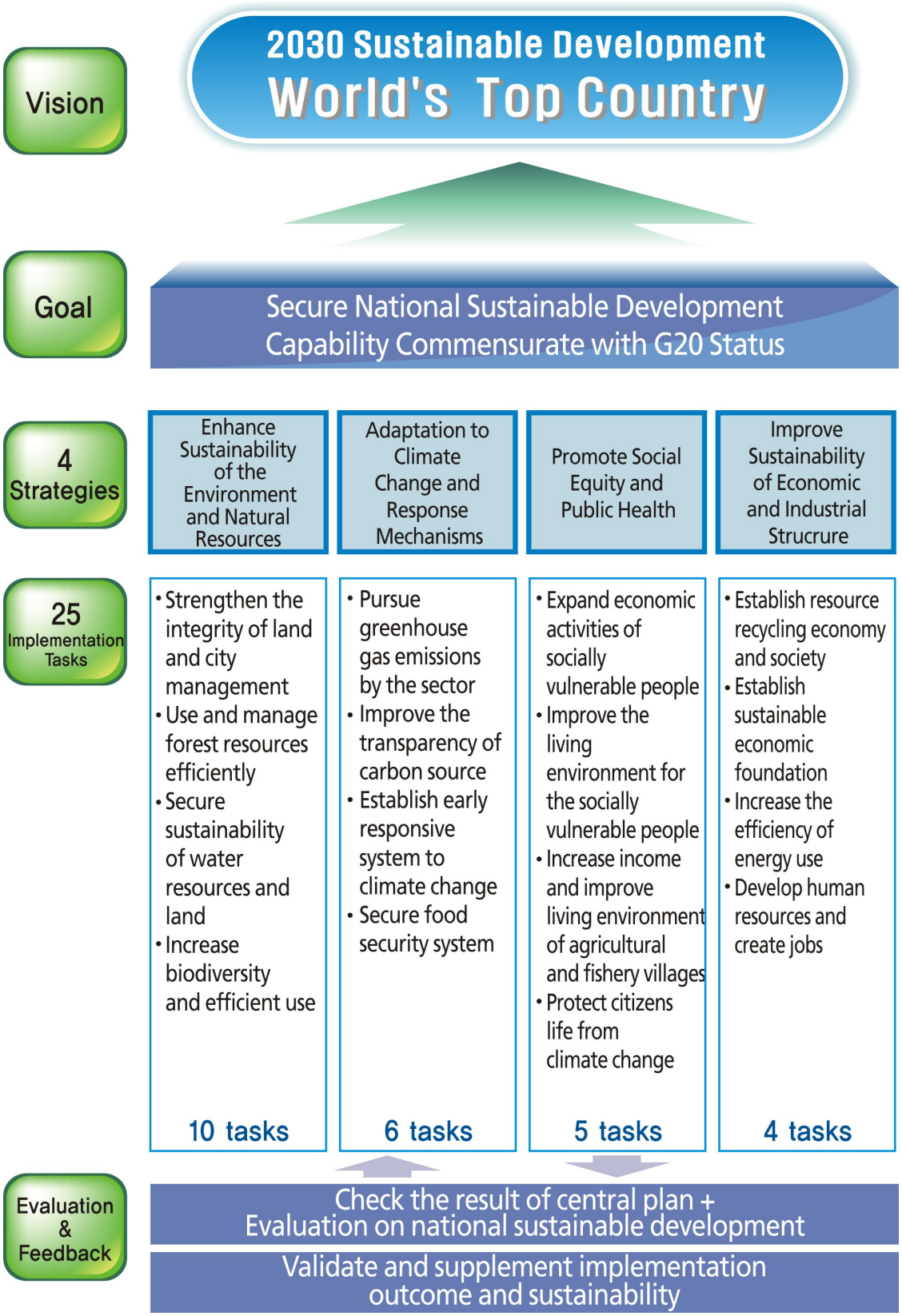
○ It should meet the needs of new policy tools at the regional and local level for integrated management of the policies.

□ Paradigm shift in national development strategies

○ It should be a key strategy for responding to for the 21st century global issues at the national level a key strategy.

○ It should be commonly agreed policies and assessment tool for international cooperation, communication and implementation.

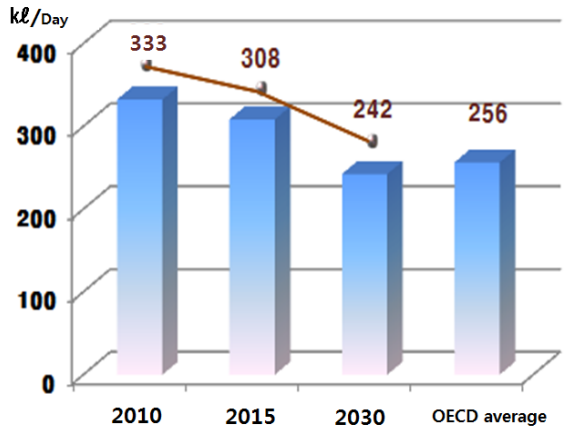
3. National Vision and Strategy



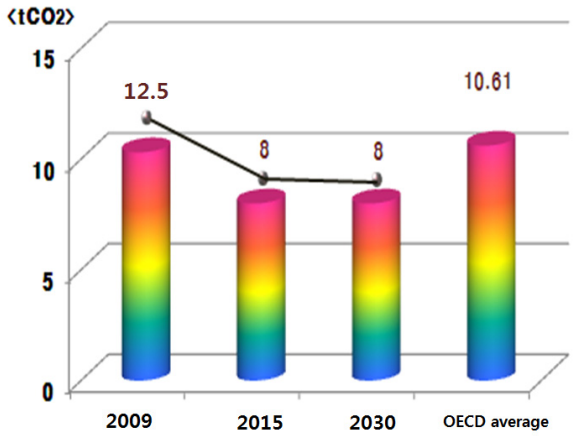
4. Prospect of Sustainable Development

Indicator on Sustainable Development Outlook

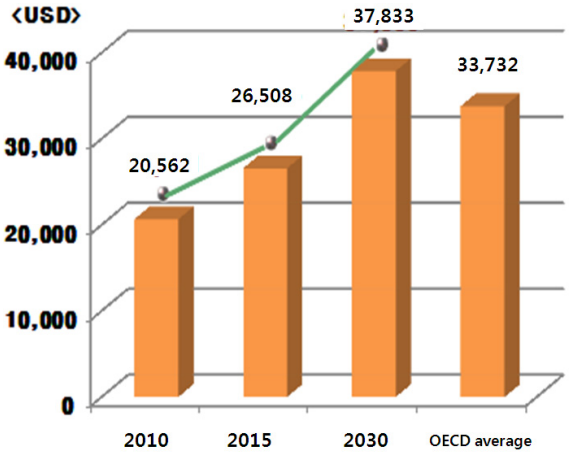
Water Consumption Per Capita



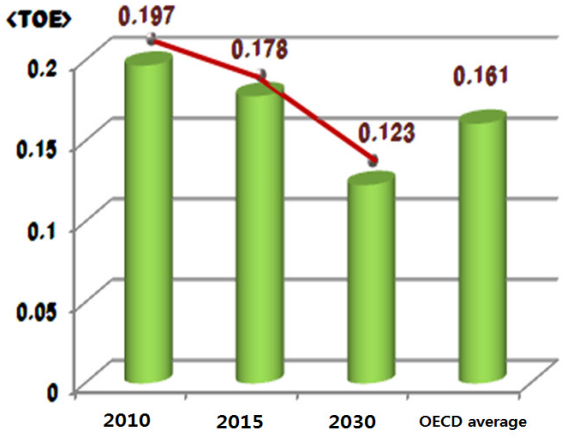
GreenHouse Gas Emission Per Capita



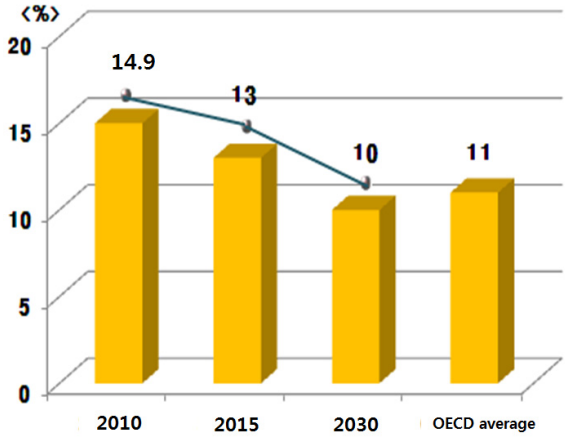
GDP Per Capita



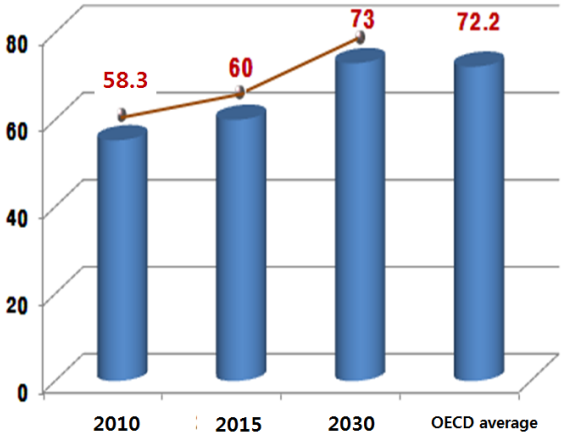
Unit of Energy Source



Percentage of Poverty Population



Percentage of public resources in National Health Expenditures



□ Major indicators

Field	Indicator	2010	2015	2030	OECD Average*
Environment	Water quality (BOD, ppm)	1.48	0.95	0.95	2.7
	Metropolitan concentration of particulate matter ($\mu g/m^3$)	48.7	40	35	35
	Amount of water consumption per capita (L/day)	333	308	242	256
	GHG emissions per capita (tCO_2)	12.5 ('09)	8	8	10.61 ('08)
	Park area per capita within a city (m^2)	7.6	14.4	20	19.79 ('06)
Economy	GDP per capita (USD)	20,562	26,508	37,833	33,732 ('08)
	Energy unit (TOE/$1,000, Year 2000 PPP Standard)	0.197 ('09)	0.178	0.123	0.161 ('09)
	Share of renewable energy supply (%)	2.54 ('09)	4.33	11.0	7.7 ('09)
	Employment rate (%)	63.8 ('08)	64.3	66.7	66.7 ('08)
	ODA to GNI ratio (%)	0.12	0.25	N · A	0.32
Society	Percent of population living below the poverty line (%)	14.9	13	10	11 ('06)
	Gini index of income inequality	0.310	0.300	0.280	0.311 ('09)
	Public revenue to national health expenditure ratio (%)	58.3	60.0	73.0	72.2 ('08)
	Percentage of aged population (%)	11.0	15.1	28.3	14.8 ('08)
	Average life expectancy (year)	80.8	81.4	84.03	81.6 ('09)

* OECD Average (The average of OECD members in 2010)

5. The Main Contents

1 Enhance Sustainability of Environment and Natural Resources

- Establish an efficient management system for integrated management of environment and natural resources
- Increase the productivity and health of urban area, forest and coastal marine ecosystems
- Disseminate the cultural practice of green life through continuous education and public relations

■ Strategies

○ Land and urban planning for effective land conservation and development

○ Adoption of advanced water management for future water resources capacity building

○ Reinforcement of soil contamination management systems for a healthy soil environment

○ Creation of green Korea that links ecosystem of mountains, swamp, tidal, and coastal marine

○ Construction of effective natural disaster prevention and response system

○ Promotion of sustainable development through education and public relations

■ Goals

Indicators	2010		2015
Park area per capita within a city (㎡)	7.6	→	14.4
Water quality (BOD, ppm)	1.48	→	0.95
Number of national species	36,921	→	40,000
Amount of water consumption per capita (L/day)	333	→	308
ODA to GNI ratio (%)	0.12	→	0.25

■ **Implementation Tasks**

Implementation tasks (10)	Detailed tasks (34)
1-1. Strengthen integrity and structure of land and city	1-1-①Strengthening the integration of land and urban management
	1-1-②Establish integration system on national spatial data
	1-1-③Urban expansion and strengthen networks of ecological space
1-2. Sustainable forest management	1-2-①Valuable forest resource development
	1-2-②Expanding forests services
1-3. Sustainable coastal marine environmental management	1-3-①Integrated management system of coastal and marine area
	1-3-②Create a clean and lively coastal and marine environment
	1-3-③Maintain coastal biological diversity
	1-3-④Building a sustainable fishery systems
1-4. Enhance soil management systems	1-4-①Improve soil management criteria and strengthen evaluation
	1-4-②Strengthen preventive system of soil contamination
	1-4-③Strengthen soil management in vulnerable areas
	1-4-④ Technology and industry development of soil environment
1-5. Design basis for sustainable wetland management	1-5-①Convert from sporadical to broad-based wetland management
	1-5-②Introduction of advanced management system of wetlands
	1-5-③Prepare a harmonized basis for conservation and use of wetlands
1-6. Secure biodiversity	1-6-① Ensure diversity of biological resources
	1-6-② Measure for ecosystem conservation in DMZ

Implementation tasks (10)	Detailed tasks (34)
	1-6-③ Strengthen protection of endangered plants and animals
	1-6-④ Strengthen management of invasive species that alter ecology
	1-6-⑤ Risk assessment of genetically modified organisms to ecosystem mechanisms
1-7. Sustainable Water resource Management	1-7-① Establish policies on sustainable management water
	1-7-② Expand reliable supply of water resources
	1-7-③ Strengthen sewage treatment facilities and management
	1-7-④ Expand development of green alternative water and water reuse
	1-7-⑤ Water demand management mechanisms through realization of water value
1-8. Sustainable prevention of natural disasters	1-8-① Building national disaster response system
	1-8-② Improve disaster recovery system to prevent repeated damage
	1-8-③ Prevention of climate change caused disasters
	1-8-④ Stable settlement of consumer-driven insurance on flood damage
1-9. Education and public relations for sustainable development	1-9-① Establishment of Education basis for Sustainable Development
	1-9-② Promote publicity basis on sustainable development
1-10. Strengthening international cooperation for sustainable development	1-10-① Strengthening international cooperation network for sustainable development
	1-10-② Promote expansion of ODA (official development assistances)

2 Adaptation to Climate Change and Response Mechanisms

- **Promoting low carbon society by reducing greenhouse gas emissions**
- **Strengthening climate change adaptation ability through developing climate change scenarios to empower response to unusual weather phenomena**
- **Achieving competitiveness and market advantage through training in climate industry**

■ Strategies

○ Strengthen capacity for responding to climate change through facilitating sectoral greenhouse gas emissions reduction and expansion of monitoring network for climate change

○ Expanding the carbon absorption capacity of forests and agricultural fields

○ Establish national system for food security through climate-friendly technologies in food production

○ Excavate business development on climate industry and adaptation to climate change

■ Goals

Indicator	2010		2015
GHG emissions per capita (tCO_2)	12.5 ('09)	⇨	8
Forest carbon stocks (million tCO_2)	1,494	⇨	1,695
Weather-climate industry development (100 million won)	540	⇨	2,315
Food self-sufficiency (%)	54.7	⇨	57
Transportation shares of public transport mode (Seoul metropolitan area, %)	54	⇨	60

■ **Implementation tasks**

Implementation tasks (10)	Detailed tasks (34)
2-1. Reduction of GHG emissions by sector for carbon reduction	2-1-①Promotion of greenhouse gas emissions reduction by sectors
	2-1-②Promote greenhouse gas emissions reduction in the building sector
	2-1-③Promote greenhouse gas emissions reduction in the transport sector
	2-1-④ Promote greenhouse gas emissions reduction in the waste sector
	2-1-⑤ Promote greenhouse gas emissions reduction in the food, agriculture, forestry and Fisheries sector
2-2. Transparency of carbon emissions sources	2-2-① Development and management of disclosure indicator on carbon
	2-2-② Promote active disclosure of carbon information by division and target
	2-2-③ Establish and operate national statistics on greenhouse gas emissions
2-3. Expand Sustainable carbon sinks	2-3-① Expand forest carbon sinks
	2-3-② Develop bio-circular forest
	2-3-③ Expand carbon storage capacity in agricultural sector
2-4. Establish an early response system to climate change	2-4-① Raise the surveillance system on climate change
	2-4-② Produce climate change scenarios and develop predictive models of climate change
2-5. Establish national food security system	2-5-① Impact assessment and prediction on food production from climate change
	2-5-② Raise climate-friendly basis of food production
	2-5-③ Establish information system on major grain consumption and production
	2-5-④ Expand international cooperation on resilient food supply
2-6. Enhance identification of new project on adaptation to climate change	2-6-① Support policy development for identification and development of new business
	2-6-② Foster industries on climate change and develop weather support map

3 Promote Social Equity and Public Health

- **Improving the quality of life for vulnerable groups**
- **Public health protection against environmental challenges**

■ Strategies

○ Promoting economic activity and improving living conditions of the disadvantaged communities

○ Improving rural incomes and living conditions

○ Strengthening Environmental disease prevention and control

○ Organizing and expanding public health care system

■ Goals

Indicator	2010		2015
Gini index of income inequality	0.310	⇨	0.300
Public revenue to national health expenditure ratio (%)	58.3	⇨	60.0
Metropolitan concentration of particulate matter ($\mu g/m^3$)	48.7	⇨	40
Number of houses below the minimum housing conditions (%)	10.6	⇨	10
Percent of children material goods for Risk Assessment (%)	4.4	⇨	100

■ **Implementation tasks**

Implementation tasks (5)	Detailed tasks (16)
3-1. Promote economic activities in disadvantaged communities	3-1-① Strengthening financial support for the disadvantaged communities
	3-1-② Expand the employment of the disadvantaged communities
	3-1-③ Enhance manpower utilization of the aged to prevent aging society
3-2. Improve the living conditions of vulnerable communities	3-2-① Strengthen health services support system for vulnerable groups
	3-2-② Enhance the housing support for the vulnerable communities
	3-2-③ Promote youth health care
3-3. Build a community-based rural development	3-3-① Stabilize management and income of farmers
	3-3-② Expand basis on rural health and medicine
	3-3-③ Expansion of basic rural infrastructure
	3-3-④ Prepare basis of rural area development
	3-3-⑤ Strengthen risk management of agricultural sector
3-4. Protect the public life from changes in environment	3-4-① Strengthen environment disease prevention and control
	3-4-② Strengthen management of respiratory diseases from air pollution
	3-4-③ Advance safety management of hazardous chemicals and hazardous waste materials
3-5. Strengthen public health	3-5-① Efficiency of public health care system
	3-5-② Expand essential Health Care Safety Network

4 Improve Sustainability of Economic and industrial structure

- **Through the establishment of a resource recycling industrial structure, improve the country's resources**
- **Sustainable consumption, production companies building management system**
- **Human resources and the green industry jobs**

■ Strategies

○ Develop economic and social composition of resource recycling

○ Build a green economy base through establishment of sustainable production and consumption systems

○ Expand national self-reliance in energy through low consumption and high efficiency.

○ Create leading green jobs and technical expertise

■ Goals

Indicators	2010		2015
Share of renewable energy supply (%)	2.54	⇨	4.33
Energy unit (TOE/1,000$, based on PPP of 2000)	0.197 ('09)	⇨	0.178
Number of companies issuing sustainability reports	140	⇨	180
Market share for green products (trillion won)	14.8	⇨	20
Employment rate (%)	63.8	⇨	64.3

■ **Implementation tasks**

Implementation tasks (4)	Detailed tasks (15)
4-1. Compose resource recycling economy and society	4-1-① National Integrated management system on resource recycling
	4-1-② Establish active basis of market-leading resource recycling
	4-1-③ Expand food waste reduction and promotion of recycling business
4-2. Establish sustainable economic structure	4-2-① Expand sustainable consumption system through active green consumption
	4-2-② Expand sustainable production systems
	4-2-③ Sustainability management through the spread of industrial competitiveness
	4-2-④ Low-carbon technology development and growth engine
	4-2-⑤ Promote development of environmental technology and industry
4-3. Expand efficiency of energy use	4-3-① Increase national energy independence
	4-3-② Building low energy consumption economic structure
	4-3-③ Advancement of energy technology development system
4-4. Human resources and job creation	4-4-① Expansion of advanced degree programs and experts development
	4-4-② Leading expertise in human resources
	4-4-③ Creation of green technology jobs
	4-4-④ Foster job creation through social enterprise

Chapter 2. Core Strategies and Implementation Plans

1 Enhance Sustainability of Environment and Natural Resources

1-1 Strengthen integrity and Structure of land and city

▣ Status Analysis

□ There is need to enhance land use policy framework to strengthen the efficiency of land development.

○ There is need to maintain connectivity on environmental conservation plan with the use and development of land.

○ Also there is need to build up a system on evaluation of land management in order to apply the sustainability indicators.

□ Currently, various countries are in progress with increasing national strategy for low energy consumption and energy efficiency to respond to climate change and achieve energy independence.

○ Japan has established target that by 2030, improve 30 percent in energy efficiency, while EU has established the strategy of the 20-20-20 (20% energy efficiency improvement by 2020, greenhouse gas emissions by 20% and 20% penetration of renewable energy).

○ Therefore there is need to raise the use of sustainable energy systems through the establishment of stable energy supply system.

□ Rapid urbanization and expansion of urban areas reveal the urgency on the need to improve the environment.

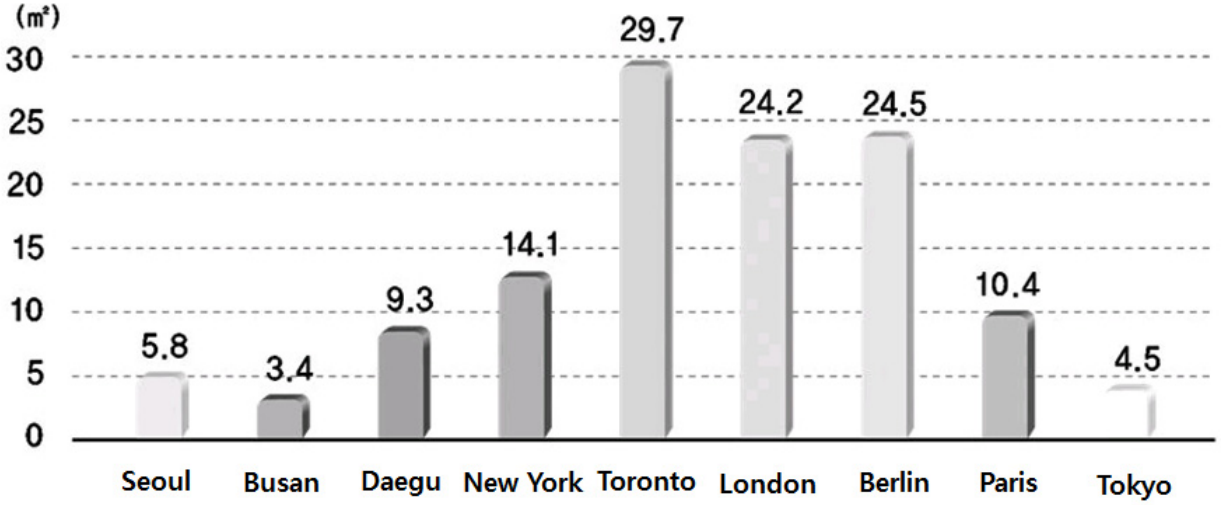
○ By 2009, 90.8 percent of the population lived in cities however there is lack of systematic management of urban environment.

○ There is increase in environmental pollution and collapse of ecological foundation of the cities.

○ Korea lacks green space in the urban areas as compared to the developed countries.

○ There is need to reinforce use of ecological space by eco-space utilization and efficiency in considering water availability, flood prevention, the multi-function expansion.

〈Global city urban park area per capita〉



▣ Direction of Promotion

☐ Strengthen integration, equity and efficiency through systematic improvement on land and urban management.

☐ Promote a balanced land use and conservation through implementation of sustainable land management and urban land development.

Indicator	Performance/goal		Measurement method
	'10	'15	
Utilization of land management sustainability indicators (%)	-	100	For policy initiatives related to land planning and land management review whether sustainability indicators (rating surrendered land utilization plan, etc.)
park area per capita within a city (㎡)	7.6	14.4	(City park area / national urban population) x100

1-1-① Strengthening the Integration of Land and urban Management

< Goal >

Prepare an land and urban management system designed to enhance integration between policies, environmental improvement, public good of the land acquisition and social agreement ·

■ Organizing Departments: Ministry of Land, Transport and Maritime Affairs, Ministry of Environment, Ministry for Food, Agriculture, Forestry and Fisheries, Korea Forest Service

▣ Execution Plan

□ Secure tier system of land planning and environmental planning

○ Escalate projects by sectors on city ecosystem and environmental mapping for establishing information on environment and ecosystem.

○ Maximize the effect of sustainable development by putting the environment programme (terrestrial and coastal) and the coastal management plan in conjunction.

○ Pre-environmental review for residential and new town development plan and coordinate environmental impact assessment, including development and conservation.

○ Integrate land, environment and coast, distinguish into individual survey items and put the results into database for common research.

□ Establishing sustainable land management systems

○ in order to prevent degradation of environmental capacity of wetlands and other natural resources, introduce total management system on wetlands, green space and such natural resources with high conservation value.

○ Apply growth management plan when urban planning in order to improve its sustainability.

○ Attribute management measures by characteristics the farmland and planning criteria that has applied spatial characteristics of farm village.

○ Implement Coastal Management Section in order to strengthen coastal waters enforcement purposes.

○ Complement related legislation to promote sustainable area and projects on improvement of urban environment that have the purpose of restoring water, air and natural ecological environment.

○ Prepare support measures for areas with many designated conservation areas, improve the standards and improve grant system of ecosystem conservation cooperative fund to support the preservation and restoration of the excellent area with natural environment.

○ Compensate for loss of development opportunities in accordance with conservation area and deliberate local government support measures to suppress no-plan development by reflecting administrative needs on the forest area, field and other nature area of municipalities.

□ Establish sustainable land management evaluation system

○ Assess major policies and plans on land management by using the sustainability indicators of land management in order to reflect its results on the plans.

□ Land Governance in Environmental Management

○ Expand the participation of diverse civil representatives like the central and local city development major examination bodies such as Planning Commission, the Central Coast Regional Coastal Management Council Management Council, and including representatives of private sector participation.

○ Uplift the role and status of the Commission on Sustainable Development Organization which is a body from public-private partnerships between government, citizens and corporate.

▣ Performance Indicator

○Utilization of land management substantiality indicators (%)

1-1-② Establish Integration System on National Spatial Data

< Goal >

All departments are run by building a national spatial data integration and integrated spatial information system.

■ Departments organized : Ministry of Land, Transport and Maritime Affairs

■ Cooperating Authorities : Ministry of Environment, Ministry of Public Administration and Security, Ministry for Food, Agriculture, Forestry and Fisheries, Korea Forest Service, Cultural Heritage Administration, local government

▣ Execution Plan

□ Build "National Spatial Information Integration System"

○ Establish a lookup mechanism on land information in order to inquire information about the systematic use and conservation of the land nationwide for a systematic land information management.

□ Establish public information system by increasing the "National Spatial Information Integration System" in the central government ministries and local governments.

○ (Spread infrastructure) Expand and share the "National Spatial Information Integration System" in the central ministries and local governments.

○ (Provide open-utilization system of international standards) Provide the Open-API (Application programming interface) that uses open international standards (OGC) in the private sector in order to take advantage of "National Spatial Information Integration System."

▣ Performance Indicator

○ Rate of establishment of National Spatial Information Integration System (%)

1-1-③ Urban expansion and Strengthen networks of ecological space

< Goal >

Implement various schemes and programs for expansion of urban ecological space.

■ Departments organized : Ministry of Environment, Ministry for Food, Agriculture, Forestry and Fisheries, Ministry of Land, Transport and Maritime Affairs, Korea Forest Service

■ Cooperating Authorities : Meteorological Agency

▣ Execution Plan

□ Expand and provide guidelines for creating multi-functional ecological space

○ Establish expand measures that consider connectivity and ecological space that can contribute to Biological forms, flood mitigation, water resources and water circulation system.

- Horizontal infiltration space for rainwater, water cycle urban wetlands, wildlife habitats detention pond.

□ Design guidelines for improving the city water cycle system and promote business

○ Prepare measures to improve water cycle system for protection of dry river, creation of urban amenities and recreational space for local residents and restoration of urban ecosystem.

- Reuse of sewage treated water and rainwater, mainstream flow supply, regional water supply, facilities and infiltration facilities and reservoirs.

□ Prepare and disseminate guidelines for Urban Ecology Network composition

○ Seek measures to strengthen linkage with broad area of ecology and expand it nationwide through expanding and providing various types of ecological space.

□ Promote projects on the conservation and restoration of ecological space within the city

○ Create various types of ecological space for the city to be extend to greater ecological axis like the wild animal paths for moving, rooftop greening, and ecological pond.

- Support for eco-space preservation in the city, create guidelines to restore the supply in order to activate its composition and management.

○ Create urban green space and green road to enhance connectivity.

- Establish green road guidelines (2010) according to the promotion and expansion of green space expansion project.

□ Strengthen composition and management of biotope

○ Expand livelihood green space in the city by taking advantage of the remnant space, national and public lands, schools, and establish biotope, city and village forest woods by municipalities.

○ Compose and manage ecological pillar that links the forest with biotope, cities, parks and green areas.

○ build a green network of city through improving management system and environment for growth and development of existing trees and composition and development of management technology for promoting trees.

○ Support citizen participation in greening of cities which have function that prevent heat island effect, carbon sinks and provide habitat.

□ Establish measures on activating and instituting urban agriculture

○ Establish institutional framework and seek activation of urban agriculture that has functions to suppress the occurrence and absorption of CO_2, urban food supply and excellent penetration.

□ Develop technology on quantitative climate impact analysis of inner city ecological space

○ Analyze climate impacts using software that utilizes the Seoul Climate Analysis (CAS).

- Develop technology on analysis of climate change impact in the cities based on various urban development scenarios.

▣ **Performance Indicator**

○ Ecological restoration area (㎡)

○ Per capita city park area (㎡)

1-2 Sustainable Forest Management

▣Status Analysis

□ Increase role of forestry sector in realizing low-carbon society

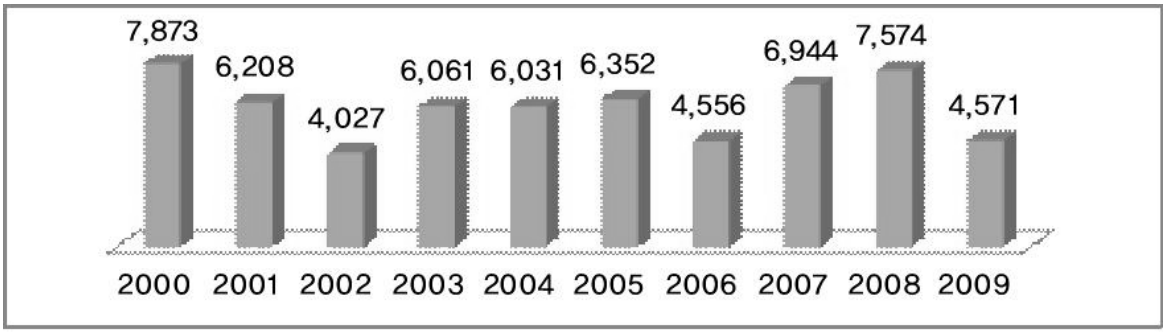
○ Highlight the importance of forests for expansion of carbon sinks such as planting forest.

□ Highlight the importance of preservation and management of forest ecosystem

○ Increased natural disasters caused by extreme weather threatening health of forest ecosystems.

○ Increased negative perceptions about mountainous damage that exists in development of mountains.

<The last 10 years (2000-2009) Changes in forest area reduction (unit : ha)>



□ Increased demand for forest recreation and welfare

○ increase wellness, and quality of life, according to the increasing demand for recreation.

○ Increase In demand for variety of forest welfare being like healing forests, mountain climbing, urban forests etc.

▣ Direction of Promotion

□ Establish the Sustainable Forest Management Systems that meets the role of forest resources.

□ Improve social welfare and foster economic development through healthy forests.

Indicator	Performance goal		Measurement method
	'10	'15	
Planting forest Area (thousand ha)	251	250	results of forest business during the year
Healing Forest Administration (places)	3	10	establishment of healing forest management (cumulative)

1-2-① Valuable Forest Resource Development

< Goal >

Design Sustainable Forest Management System by establishing nature-friendly user system at the same time conserves forest ecosystem and increase its productivity.

■ Departments organized : Korea Forest Service

■ Cooperating Authorities : Ministry for Food, Agriculture, Forestry and Fisheries, Ministry of Environment

▣ **Execution Plan**

□ Conservation and management of healthy forest ecosystem

○ Systematic forest conservation and management

- Specify forest genetic resources and ecological protection composition of the forest, expand arboretum and eco-forest domestically, establish user system that researches and excavates useful plants, promote renewable bio-survey research and excavation.

○ Forest Pest Control system for early deployment

- Carry out ongoing control measures and prepare measures on Forest Pest Control.

○ Establish nature-friendly user system on mountain through strengthening survey and surveillance system on private limited mountainous region.

- strictly preserve mountainous regions of high conservation value.

□ Value Creation and development of forest resources

○ Promotion of the project of 'making forest-like forest' in order to enhance the value of forests and its ecological health.

○ Expand economic forests that can sustainably be used and is ecologically healthy. In addition grow specific domestic wood production and manage basis of good timber resources.

○ Promote public interest through increased investment in forest operations like afforestation.

▣ **Performance Indicator**

○ Plantation area (Thousand ha)

○ Planting forest Area (Thousand ha)

1-2-② Expanding forests Services

< Goal >

Enhance Green Forest Resources that provide public recreation space.

■ Departments organized : Korea Forest Service

■ Cooperating Authorities : Ministry for Food, Agriculture, Forestry and Fisheries, Ministry of Environment

▣ Execution Plan

□ Provide forest recreation and healing services that the civilians and residents can experience.

○ Install and operate recreation facilities for leisure and experience like prenatal educative forests, forest kindergartens, leisure complex.

○ Establish infrastructure for the healing forests.

□ Create culture-driven new hiking paths through network of forest paths nationwide.

▣Performance Indicator

○ Operating performance of healing forest

○ Results of forest composition

1-3 Sustainable coastal marine environmental management

▣Status Analysis

☐ Urgency in need to accelerate measures related with increasing cause of confusion in river ecosystems and destruction of marine coastal ecosystems.

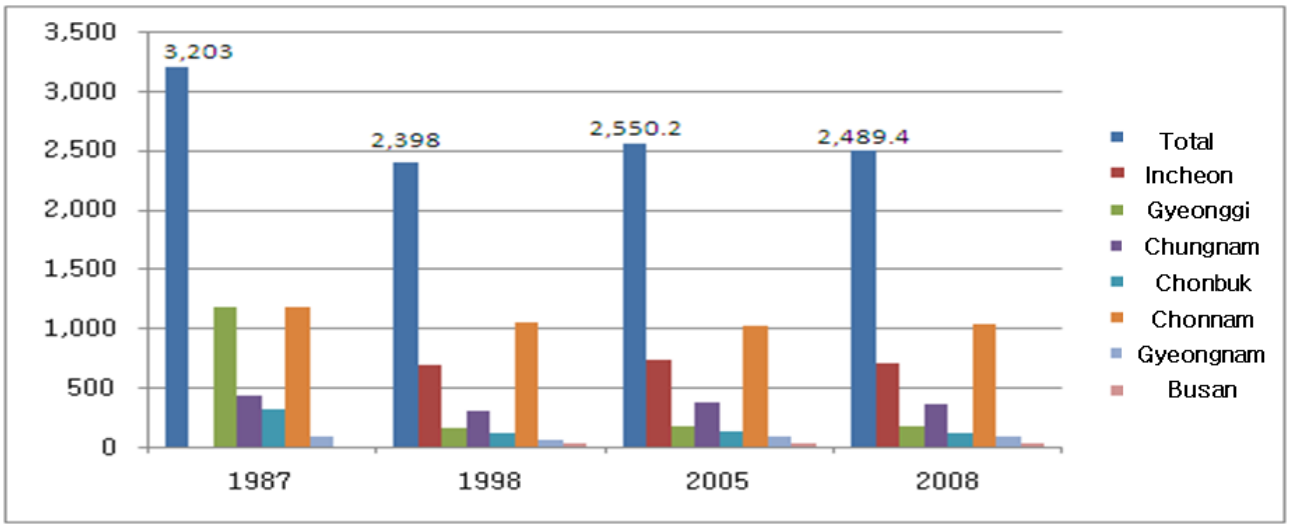
☐ There is need for policy basis on coastal marine resources

○ Need to seek measures to increase efficiencies through integrated management of coastal marine management system.

○ Need to seek adaptive measures and coastal change management system caused by rise of sea-level.

- The past 43 years (1964-2006), South Coast sea level rose about 8 ㎝.

<Transition of Tidal area changes (unit : ㎢)>



☐ There are challenges like lack of participation by both stakeholder and local residents and lack of mechanism for conflict resolution in the coastal marine protected areas.

▣ Direction of Promotion

□ Establish system for sustainable conservation and utilization of coastal marine environment.

□ Preservation of healthy coastal marine environment and that meets economic needs about coastal marine resources.

Indicator	Performance goal		Measurement method
	’10	’15	
Tidal Area (㎢)	2,489.4 (’08)	2,738	City: provinces tidal area of the sum of (aggregate)
Coastal Pollution (ppm)	1.07/1.47/1.13 (‘08)	1.0/1.3/1.0	COD measurements (East coast / West coast / South coast)

1-3-① Integrated Management System of Coastal and Marine Area

< Goal >

Establish and implement policies for future-oriented management and user system of coastal and marine areas

■ Departments organized : Ministry of Land, Transport and Maritime Affairs, Ministry of Environment

▣ **Execution Plan**

□ Introduce and implement a target system on natural coastal management

○ Realize planned management of natural coastal area through early implementation of natural coastal management Target System like the Coastal Act to protect the natural coastline.

○ Manage habitat and quantify management target through implementation of the no-net-loss system and restoration of natural coasts and habitats.

○ Integrate the system on separated research, conduct joint research by related departments on natural coasts and habitats surveys and establish management systems.

□ Integrated management of coastal and marine protected areas

○ Strengthen surveillance through introducing periodic inspection and evaluation system and improve processes on zoning standards, procedures and management of the coastal and marine protected areas.

○ Identify best practices and promote training and publicity for transition of awareness on the protected areas.

□ Build wise user system of coastal sand dunes

○ Sublate installation of artificial structures where natural barriers act as coastal dunes.

○ Plan on promoting the lagging local economy in areas near natural barriers due to development as vacation and eco-tourism spots.

○ Further develop marine eco-tourism resources such as through creating marine ecosystem trails and tidal restoration.

- Restore the role of tidal area that has been damaged and contaminated through expanding pilot projects on its restoration for eco-tourism.

□ Management of exclusive economic zone and continental shelf

○ Establish and implement comprehensive management plan of EEZ mark against maritime boundary delimitation, resource development and land-related conflicts.

○ Strengthen investment and survey on the state of affairs around the ocean on its characteristics and natural resources.

○ Enhance the ability to manage the wide ocean by strengthening efficiency on defense capabilities of maritime and territorial jurisdiction.

□ Improve water management system on separated coastal waters

○ Establish measures that allows periodical renewing of pollutant emissions permits on pollutant emission facilities (5 to 10 year cycle) support system of water pollution total management system in order to guide the reduction of continuous increase in pollution load.

○ Implement the administrative management section of the special coastal areas and expand coastal area where long-term coastal water pollution management take place while considering local economic conditions.

○ Establish 'coastal basin consultation system' based on cooperation between Ministry of Environment and Ministry of Land, Transport and Maritime Affairs, in order to overcome performance degradation caused by separated management systems and secure expertise.

□ Develop and disseminate the techniques on assessment of Korean coastal vulnerability

○ Survey on vulnerability to climate change like tsunami

- Assess vulnerability to climate change that considers economic and social vulnerability of major coastal cities.

○ Develop and disseminate coast disaster analysis, evaluation indicator and techniques.

- Develop assessment tools on vulnerability of Korean coastal disaster (K-CVAT) and produce physical vulnerability indicators of coastal disaster.

○ Establish a shared system on spatial information and map out coast disaster vulnerability.

- Map out coast disaster vulnerability in high-resolution and share its spatial information via internet.

- Develop real-time information sharing system of database between the central and local government on disaster vulnerability.

▣ **Performance Indicator**

○ Records on coastal pollution management performance

○ Tidal Area (㎢)

1-3-② Create a Clean and Lively Coastal and Marine Environment

< Goal >

Further scientific and systematic management of coastal and marine ecosystems·and scientific cooperation in East Asia Marine Environment

■ Departments organized : Ministry of Land, Transport and Maritime Affairs

■ Cooperating Authorities : Ministry of Environment

▣ Execution Plan

□ Scientific and systematic management of coastal and marine ecosystem

○ Establish integrated survey system in connection to Land - Coastline - Coast-tidal-marine, or Estuary - Tidal - Coastline.

○ Manage residents participating coastal marine observation network and strengthen environmental management of coastal basin.

○ Establish an integrated management information system for the marine environment information to identify a comprehensive system of marine survey with variety of data and investigative techniques.

□ Expand regional cooperation in East Asia waters

○ Strengthen the status of Korea in Eastern Coast of Asia by expanding the official development assistance (ODA) for marine environment and coastal management.

○ Secure initiative in environment management of the East Asian region through support and programme activities of East Asia Cooperation in Environmental Management by UNDP/IMO.

□ Management and protection of the Antarctic environment and ecosystem

○ Progress (continued until 2014) with designating enlarging of the Special Protection Area (Penguin Village).

- Establish systematic ecological monitoring (CCTV installation, etc.) and impact analysis.

※ Review conducted every five years, review and extend to the waters around currently restricted land as the protected areas.

○ Check on the status of the Antarctic (King Sejong Station) environmental management practices and the penguin village (if necessary).

▣ **Performance Indicator**

○ Coastal pollution (ppm)

1-3-③ Maintain Coastal Biological Diversity

< Goal >

Understand marine biodiversity and establish a comprehensive management system for conservation of marine living resources

■ Departments organized : Ministry of Land, Transport and Maritime Affairs

■ Cooperating Authorities : Ministry of Environment

▣ Execution Plan

□ Monitor Korean coastline marine biodiversity

○ Establish policies for conservation and management of marine biodiversity to regularly monitor marine biodiversity.

○ Secure reliability of investigation of marine biological resources through standardization of monitoring and promote further research preservation on marine biological resources through obtaining biological samples.

□ Informatization of coastal biodiversity of marine life

○ Create a list of marine life, ecological information, specifications, etc. of marine ecosystems and marine life in order to systematically promote its conservation and management.

○ Promote database in the GIS (Geographical Information System) of genetic information from the list of marine organism of which that appear in the waters around Korea.

○ Promote informatization by implementing measures on marine biodiversity conservation and promote development and utilization of domestic bio-analysis experts.

□ Establish specific management system on coastal marine species

○ Establish protective measures by conducting systematic investigation on indigenous species in our coasts, basic survey of marine ecosystems, marine biodiversity research, basic research on coastal wetlands.

○ Effective management of coastal ecosystems by setting up control measures on exotic and harmful species entering the marine ecosystem.

○ established research for management measures and prediction on increase in number of new species that happen with climate change.

□ Marine Biodiversity International Cooperation

○ Promote international cooperation projects overseas for the conservation of marine living resources.

○ enable the promotion international exchanges of professionals through International Workshop on Topics related to marine biodiversity, marine protected area management.

▣ **Performance Indicator**

○ Status of biodiversity monitoring results by region

○ Create a list of marine organisms by biodiversity

1-3-④ Building a Sustainable Fishery Systems

< Goal >

Maintain fishery resource through sustainable fishing activities

■ Departments organized : Ministry for Food, Agriculture, Forestry and Fisheries

▣ Execution Plan

□ Achieve sustainable fisheries

○ Manage fishing license and maintain appropriate level of fishery resource.

- Drive for restructuring of fishery industry like offshore fishing.

○ Create policies and expand management on fishery resource.

- Strengthen voluntary resource management and expand TAC.
- Secure greater efficiency and professionality through establishing a task force and expanding the business on sea fores, sea ranch composition of marine resources.

□ Reform eco-friendly measures and converse multilateral regional organizations

○ Lay foundation for expanding cooperation through cooperation agreement on fishery with the main coastal States.

○ Promote a larger production and enlarge Korea's Cooperation with fisheries boat for larger fishing area.

○ Strengthen autonomous public relations and establish professional support to combat illegal fishing, and maintain fishermen-oriented order in the fishing industry.

▣ Performance Indicator

○ Coastal fishery resource (thousand tons)

1-4 Enhance soil management systems

▣ Status Analysis

□ A systematic management system is required for prevention of soil pollution

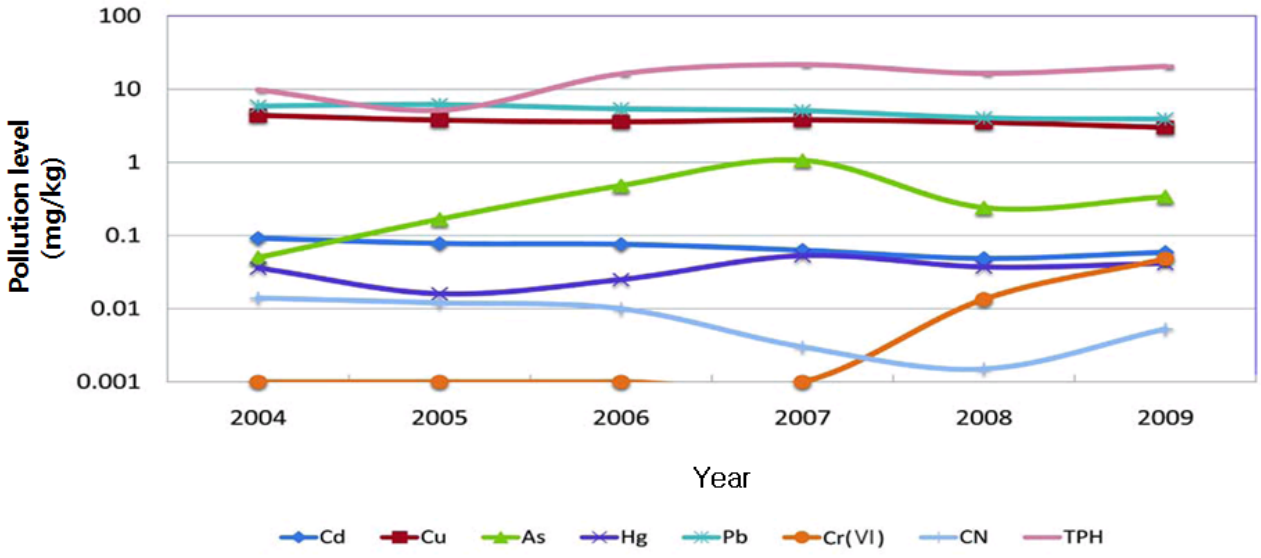
○ There is lack of a policy-base in conjunction with managing soil contamination of groundwater.

○ There is lack of promotion of damage prevention measures and pollution concerning vulnerable areas of soil contamination like closed metal mining regions, large plant area.

○ There are traces of groundwater contamination from various environmental pollution originating from military bases in the soil.

○ There are variety and diverse trends in soil and groundwater contamination environment due to increase in toxic chemicals, pathogenic viruses and increasing medical pollutants.

〈Annual Changes in Major pollution Items〉



▣ Direction of Promotion

□ Lay for foundation for a healthy soil environment to realize green communities

□ Establish soil environment industry and soil management system

Indicator	Performance goal		Measurement method
	'10	'15	
Industrial complexes to improve soil ratio (%)	82	90	Importance of pollution detection ×{1−Purified soil × 0.1/(Soil pollution of areas that exceed standards of measures×1.0+Soil pollution of areas that exceed standards of concern×0.4}×100
Soil, groundwater number of practical skills	15	25	Intellectual property rights, commercialization, and corporate sales performance results related to the number of various

1-4-① Improve Soil Management Criteria and Strengthen Evaluation

< Goal >

Set soil environmental pollution standards that affect human, establish soil pollution management basis and introduce system on risk assessment.

■ Departments organized : Ministry of Environment

■ Cooperating Authorities : Ministry for Food, Agriculture, Forestry and Fisheries

▣ Execution Plan

□ Establish set of criteria considering harmfulness to human

○ Manage pollutant risk according to their hazardousness of the pollutants like nitrogen, oils, phenols, or by total contamination level.

- Review measures standards on pollutant that has not been set based on soil organic standards.

○ Expand the soil contaminated substances by phases, based on the results of first administered substances and persistent organic pollutants management plan prepared for research project (2008-2011).

- Set soil pollution standards with priority to persistent organic pollutant harmful to the human body such as dioxins (POPs), non-regulated pollutants such as heavy metals.

- Review the criteria set after survey on special materials used at the military such as explosives.

○ Select and monitor candidate materials for expanding soil contamination standards.

- Monitor national background concentration and contamination selecting candidate materials among the soil materials subject to management (40).

○ Effectively manage soil contamination through refining criteria for each soil contamination standards such as land use or groundwater by considering characteristics of pollutants on environmental exposure.

- Improve soil contamination standards of each country on pollutant background levels, assessment on ecological and human health risk to reasonably fit domestic conditions.

□ Advance the standards on soil contamination process testing

○ establish test methods for soil contaminants concerning soil contamination criteria and candidate POPs, heavy metals, etc. and unregulated soil pollutants.

○ Prepare soil test methods that ensures economic equality and applies risk assessment

○ Establish measures that apply meet criteria for land use from future land use when applying soil contamination and cleanup standards.

- Regulate process that determines from assessment process to status on soil pollutants during various development projects such as urban planning and development of related laws.

□ Expand risk assessment of soil contamination

○ Establish risk assessment scheme in the mine area

- Build system to evaluate the mine area on risk assessment through identifying heavy metal exposure routes and assess amount of accumulation in human bodies from breathing and ingestion.

- Build an effective management and post-management of pollution prevention project by jointly establishing database on mining with relevant agencies including the Ministry of Knowledge Economy.

○ Prepare application basis on soil risk assessment

- Develop risk assessment model designed to fit the scientific field research and domestic conditions for reliability of risk assessment techniques.

- Promote maintenance measure to apply the results of risk assessments for soil remediation system.

○ Introduce purification standard based on risk criteria

- Apply in a flexible way the period of purification and purification scope based on the results of risk assessment.

- Expand into the private sector step-by-step by first introducing purification projects performed by state or local governments that sets purification standards on the evidence of risk assessment.

○ study various risk assessment techniques

- Promote the study of ecological risk assessment techniques for soil contamination of ecosystems affect humans through the food chain path.

- Build database on national eco-toxicity for ecological risk assessment techniques appropriate to domestic conditions.

- Promote research on risk assessment methods and contaminated site investigation for risk assessment of pollutants like TPH (total petroleum hydrocarbons) and complex pollutants.

- Provide step-by-step techniques on risk assessment for new contaminants to be included in the criteria of future soil contamination.

□ Soil Evaluation System Activation

○ Promote study on method for soil environment to improve any insufficiency and enhance reliability and reasonableness of the soil evaluation system.

- Improve methods on soil environmental assessment in order to strengthen objective evidence of the responsible soil contamination.

○ Enhance relevant laws to be stipulated to complete the remediation of contaminated soil before development projects when the contamination level exceeds its standards.

○ Establish separate criteria on facilities, equipment and personnel for professionalism/expertise of Soil Environmental Assessment Agency.

▣ **Performance Indicator**

○ Results of risk assessment and soil contamination

1-4-② Strengthen Preventive System of Soil Contamination

< Goal >

Expand the target of soil pollution and prevent soil pollution through strengthening its monitoring.

■ Departments organized : Ministry of Environment

▣ Execution Plan

□ Expand the soil pollutant target to be managed

○ Expand specific soil management facilities into various facilities and grounds not only the current storage facilities that cause soil contamination.

- Areas with exceeding individual plant standards for heavy metals, metal mines, landfills and incineration facilities, waste recycling sites, military facilities, shooting ranges, etc.

○ Convert the management system into that which is health-oriented by including heavy metals and toxic chemicals from the existing system that is centrally based on oil pollution and soil contamination.

○ Promote mandated measures to improve facilities when soil contamination is identified by regularly inspecting soil contamination of the related sites.

□ Reinforce soil pollution monitoring

○ Strengthen management of identified sites that are above a certain level in soil contamination.

- Strengthen inspection cycle for oil contamination concerning specified managed property that exceeds certain level of pollution but whose soil pollution and soil contamination test results does not exceed the standards concerned.

○ Differentiate the research points by business size by considering the capacity, number and distance between the storage facility of soil contamination.

○ Strengthen standard on soil contamination test at any time when conducting it by lease or take over the facilities.

○ Enhance responsibility on inspection of poor soil contamination for assessment to bring substantial measures.

○ Draw up cartography on background concentrations of soil contaminants

- Use national background map in future soil conservation policies with continuous monitoring results on soil contamination as the basis.

□ Escalate monitoring of soil network

○ Escalate the measurement points for accurate adjustment on status, trends and quality through the precise diagnosis of soil monitoring network operation survey.

- Carry out precise diagnosis of soil network management, mechanisms of contaminant movement and proliferation considering the adequacy of the measurement points and point soils of the surrounding environmental conditions.

- Extend the monitoring network point locations to 3000 by 2017 by considering geological, land availability, air and water pollution affected area, and groundwater investigation.

□ Mandatory installation of soil contaminants leak detection devices

○ Authorize incentives, periodic leak checks and improvements to prevent leakage of complement system and make it mandatory to install leak detection devices for pre-pollutant storage tanks.

- strengthen the standards of Soil pollution and soil contamination prevention facilities or through self-management system exempt leak testing operations and reduce the burden of project area.

□ Establish tracking system step-by-step on purification of contaminated soil exported

○ Introduce ticket system of payment in emissions, shipment and purification when contaminated soil is exported, in the process of secondary pollution during purification and its prevention.

▣ **Performance Indicator**

○ Soil contamination (including groundwater) Research support scores

1-4-③ Strengthen Soil management in Vulnerable areas

< Goal >

Soil management system designed for sensitive areas and early prevention of spread of contamination.

■ Departments organized : Ministry of Environment

▣ **Execution Plan**

□ Promote improvement and expansion of soil survey

○ Expand the soil reclamation area surveyed as public surface landfill area and larger area of waste recycling and conduct pollution inspection on the areas identified with pollution.

○ Promote management in conjunction with soil and groundwater by conducting pollution inspection in groundwater contamination area.

- Analyse correlation of groundwater and soil contamination and trace path on groundwater contamination resulting from soil.

□ Complete environmental impact study at sites where mining pollution prevention project has been completed

○ Conduct annual surveys on possible spread of contamination and status on prevention project on mining area where the pollution prevention project has been completed.

- Promote permanent pollution prevention projects and conduct additional mining pollution prevention project based on the research results of facility damage, agricultural pollution etc.

□ Survey soil contamination of industrial park

○ Conduct annual survey on soil contamination by selecting 50 selected industrial locations concerned among the small and medium-sized industrial complexes in addition to the 25 since 2012.

※ Survey : National Industrial Complex 21 spots, 195 spots of local Industrial Complex

□ Promote improvement on soil pollution prevention facilities of old gas stations

○ Give support on part of the cost when improving preventive facilities on aging facilities over certain period of time such as double-walled tanks and double plumbing through state aid and loan.

○ Induce various incentives for improving facilities such as exemption of soil contamination survey on gas stations whose facilities are being improved.

□ Improve state's role on soil management

○ Provide legal basis for government or local self-governing bodies to drive direct purification business on the pollution deepening region.

- Regulate the target and scope of contaminated land provisions and prepare basis for financial support of cost for purification.
- Prepare basis for the establishment of mechanism designed to perform specialized purification project formed by local self-governing bodies.

○ Perform early prevention of hazard spread to enhance the effectiveness of government-led project for soil purification in the area.

□ Introduce national purification priority system

○ Introduce National Priority List (NPL) system concerning the contamination factor which is unclear, land that requires urgent purification or the sites that is directly promoting purification.

○ Create new management mechanism for systematic management of contaminated land on the national priority list for purification and establish integrated management system of contaminated regions.

○ Develop database from information and status on pollution source, degree of contamination, land use and groundwawter contamination of contaminated land in conjunction with the soil information system.

□ Introduce guarantee system for the implementation of soil purification treatment

○ Promote introduction of performance guarantee on purification of contaminated soil intended for installer of facility on specific soil contamination and contractor of soil remediation.

▣ **Performance indicator**

○ Improvement percentage (%) on contamination of soil, groundwater industrial areas

1-4-④ Technology and Industry Development of Soil Environment

< Goal >

Develop industries in soil environment through technologies on prevention of soil and groundwater pollution and workforce development

■ Departments organized : Ministry of Environment

▣ Execution Plan

□ Expand market for domestic soil and groundwater sectors and promote emphasis on technology development industries of soil and groundwater in accordance with market opening linked to FTA systems.

○ Secure at least 90% of technological competencies to make provisions to become developed country by 2017 by managing and promoting emphasis on soil and groundwater pollution prevention technology development (GAIA) project.

- Develop selected key challenges and focus (including research, isolation and developing purification technology of AI burial field pollution) that combines technology elements (prevention, pollution surveys, pollution purification, follow-up).

※ 70% in 2011 → 80% by 2014 → 90% by 2017

○ Promote emphasis on selected subject on preventive measures and purification technology that falls behind as compared to developed countries.

- Enhance quick and effective delivery of results to market on technology developed on the key challenges.

- Promote concurrent development of Green Remediation Technology for making vitalization of eco-friendly cleaning technology and market utilization be possible.

□ Boost market through technology development that reflects market demand and industry support

○ Design support measures for enhancing market utilization and authentication of new technologies on soil and groundwater sectors.

- New environmental certification technologies through development of GAIA technology should be given extra points and preference when local government and national business make order in the field of soil and groundwater (current waste sector) to start up new certification technology.

□ Establish support system on technology and industrial information system for soil and groundwater

○ Design effective technology development projects by preventing duplicate studies and establishing database from domestic resources like research on technology development, patent technology, and academic thesis.

- Provide, manage and operate information on technology developed that utilizes national environmental information systems and soil and groundwater information management systems.

○ Provide real-time web-based support of information on technology and industry trends.

- Provide domestic and foreign technical information on soil and groundwater, support industry related information, introduce new technologies developed and enhance support programme through which consumer convenience is promoted.

□ Expand research projects in soil and groundwater sectors

○ Promote public sector focused research for institutional security and reform in accordance with expansion of soil and groundwater survey and risk assessment.

- Promote management measures in accordance with the effect of climate change on soil and groundwater into mid-long term management plan.

- Research for advanced risk assessment techniques for soil purification and assess technology on soil and groundwater purification.

□ Expand supply of technical personnel on soil and groundwater sectors

○ Promote development of programmes to foster technical workforce of intermediate-level skills when situation show that there is lack of such workforce.

○ Prepare systematic management system for experts in the field of soil and groundwater.

- Manage technical experts classified by levels and integrate professional talent pool from soil and groundwater-related associations, societies, and Environmental Institute of Technology and Industry.

- Career objective for technical personnel to validate a standardized management system for technical personnel career.

□ Enhance expertise of technical personnel on soil and groundwater sectors

○ Substantialize the education content concerning professional sectors through reorganizing professional staff on-site training center into a central system and refining the curriculum.

- Revise new training education of technical personnel from theory-driven to field-oriented practical training to increase practice opportunities.

- Prepare system for field trips like reclaiming practical sites that utilize closed land fills, field trips to closed mines and pollution purified sites.

○ Improve business performance of relevant agencies by strengthening registration requirements of technical personnel in the organizations related to soil and soil remediation.

- Enhance the current criteria of technical staff expansion by breaking down into advanced and intermediate technical staffs.

□ Build consumer-oriented education system

○ Enhance the expertise of technical personnel training courses through the fragmentation of the training courses.

○ Promote the refresher training further into distance training for consumer's convenience.

- Upgrade through cyber education program where experts in soil sector can efficiently receive training.

○ Strengthen standard of registration for professional engineers and technicians on soil environment to expand experts and expertise of soil environment industry.

○ Manage and support various education programmes according to social groups like professionals, none-professionals, public and private consumers etc.

□ Distribute published guidelines on purifying contaminated soil

○ Establish and disseminate guidelines on soil purification techniques.

□ Create new demand for industrial development on contaminated soil remediation

○ Promote soil re-export and purification markets by continually expanding export destinations.

- Excavate market for the activation of reused/re-excavated purified soil and provide support measure to provide incentives on soil purification.

□ Prepare direct and indirect support system for enhancing competitiveness of industries on soil and groundwater sectors

○ Prevent stale purification by industries on soil purification by strengthening the criteria for registration of companies and improve reliability and professionalism on soil remediation.

- Prevent stale imports of purification facilities by enhancing the facility standard step-by-step.

○ Establish responsible purification system through strengthening administrative sanctions for poor purification.

○ Prevent bankruptcy of small businesses and poor survey on soil remediation by introducing insurance schemes on soil purification and soil contamination survey.

□ Establish standards of reliability and transparency of soil remediation industry by designing standardizing on scheme and methods of soil remediation.

○ Measures to standardize the predictable technology on soil remediation

- Standardize optimum field applied technology selection according to the types and concentrations of contaminants, soil characteristics.

- Standardize soil remediation, decontamination procedures, and detailed process according to the method of soil purification.

□ Expand participation of private sector in land-related institutions

○ Induce activation and strengthen competitiveness of soil industry by opening up soil environment assessment and risk assessment work among agency's business needs assessment to private enterprises.

○ Establish a phased strategy for industry on soil environment to expand abroad in the short term, strengthen competitiveness of domestic technology and in the mid and long term establish support system for overseas advancement and promote pilot projects.

- Deploy overseas market monitoring system to continually provide overseas market information to local soil environment industry.

- Excavate active demonstration/pilot projects or joint research where developing countries and South East Asia countries can cooperate led by soil contamination management group/agencies.

- Promote domestic and overseas promotion of soil technology and establish a network for cooperation with overseas markets by linking with international cooperation agency, KOTRA, KOICA, etc.

▣ **Performance Indicator**

○ Field test results from industries on technology development of soil and groundwater pollution prevention

○ practical performance on technology of soil and groundwater pollution prevention

1-5 Design basis for sustainable wetland management

▣ Status Analysis

□ Establish 1st Wetland Conservation Basic Plan following the Wetland Conservation Act enacted in 1999, designate wetland protected areas (26 areas) and initiate Ramsar convention policy.

□ Enhance the environmental diplomacy of Korea by successfully hosting Ramsar Convention, raise eco-tourism attractions of the wetland protected areas (Suncheon Bay, Upo wetland, etc.) and step up national attention.

□ Draw out problems like limit in effective management of entire wetlands and ecological resource value drawn aside due to lack of policy objectives.

○ Absence of scientific research institute with a function of implementing research, survey and wetland restoration and management on the wetland functions and value.

○ Lack of leverage valuable ecological resources like ecology of wetlands: landscape and education policies.

○ Absence of institutional incentives on laws and plans that protect wetland conservation areas that has large preservation value.

○ Absence of civil, administrative and science cooperation system for promoting wise use and awareness on wetland conservation.

▣ Direction of Promotion

□ Create living peninsula where mountain - swamp - tidal ecosystem composition is connected.

□ Prepare efficient and rational management user system of wetlands.

Indicator	Performance goal		Measurement method
	'10	'15	
Ecological river and wetland restoration projects (locations)	214	285	Number of river ecology and wetland restoration projects the current year
Open Ramsar Registration	14	20	Registered Ramsar areas (cumulative)

1-5-① Convert from sporadical to broad-based wetland management

< Goal >

Restore damaged wetlands through systematic management of broad-based ecology.

■ Departments organized : Ministry of Environment, Ministry of Land, Transport and Maritime Affairs

■ Cooperating Authorities : Ministry for Food, Agriculture, Forestry and Fisheries, Korea Forest Service

▣ Execution Plan

□ Restoration of wetland management for restoring healthy wetland ecosystems peninsula.

○ Convert into district and area based wetland management for restoring wetlands that are connected to the National Broadband of wetland areas.

○ Enlarge the land area and wetland protected areas up to 1% as based on catchment area and territories.

○ Restore the damaged inland and coastal wetlands and establish and promote medium - long term plan (REP plan) for "constructing wetlands."

※ R.E.P : Restoration, Replacement, Establishment, Enhancement, Protection, Preservation

□ Promote construction of National Wetlands DB and its accessibility

○ Conduct 'survey on inland and coastal wetland' that can be basis for nationwide wetlands layout.

○ Apply marsh wetlands information obtained through research to apply its data on establishing national policy on wetlands.

○ Frame out national wetlands mapping and share it by establishing National Wetlands Information website.

▣ **Performance indicator**

○ Performance on river ecosystem and wetland restoration

○ Construction rate of DB on national wetlands information

1-5-② Introduction of advanced management system of wetlands

< Goal >

Introduce advanced management system for conserving overall net loss of wetlands

■ Departments organized : Ministry of Environment, Ministry of Land, Transport and Maritime Affairs

■ Cooperating Authorities : Ministry for Food, Agriculture, Forestry and Fisheries, Korea Forest Service

▣ Execution Plan

□ Establish rated management subject in accordance with protective value and function evaluation.

○ Classify and manage nationwide wetland protected value by grades and differentiate management and regulation measures.

- Give legal preservation of the individual wetland classification (Ⅰ ~ Ⅴ grade) by comprehensively evaluating the ecological values, environmental features, scenery value and scale.

○ Construct database and standardize information on wetlands by type, axis, rating and local governments.

○ Review introduction of 'total wetland system' for the reduction of overall loss of wetlands.

□ Prepare management measures of rice field wetlands ecosystem preservation and restoration measures.

○ Review institutional management plan of rice field wetland as a logical follow-up to 'promote diversity on rice field wetlands' as in the resolution adopted at the Ramsar Convention (2008.11.4)

○ Manage and conserve synthesis of ′Ramsar wetlands′ and ′wetland area.′

□ Establish ′national wetland centers′ as scientific research institutions on wetlands.

○ Embody national wetland policy based on scientific research on wetlands by establishing ′National Wetlands Center′ and its regional branches.

▣ **Performance Indicator**

○ Results of Ramsar registration

1-5-③ Prepare a harmonized basis for conservation and use of wetlands

< Goal >

Establish mechanism for wise use of wetlands harmonized with its conservation

■ Departments organized : Ministry of Environment, Ministry of Land, Transport and Maritime Affairs

■ Cooperating Authorities : Ministry for Food, Agriculture, Forestry and Fisheries, Korea Forest Service

▣ **Execution Plan**

□ The 2nd National Wetland Conservation Basic Plan established in 2011 (2012~2016)

○ Establish medium and long term national wetland conservation plan on 'resonable conservation and 'wise use' of the wetlands.

□ Establish conservation mechanisms for wetlands with large conservation value by applying incentives to land owners of 'Wetland Protected Area,' municipalities and residents.

○ (For land owners) extend the from designated land to proposed site by enabling land acquisition.

- Review support measures like giving 'Cash voucher Biodiversity (Biodiversity Credits)' to owners maintaining and supporting the protected areas with ecological value.

○ (For local residents) support infrastructure for experiencing ecosystem through 'ecological village.'

○ (For municipal) give priority support on budget for eco-tourism infrastructure.

□ Strengthen capacity of wetland conservation through establishing National CEPA Action Plans

○ Raise Korea's wetland and nature conservation policies in the international platform by establishing Korean national wetland CEPA action plan on 'the conservation and wise use.'

○ Set specific roles in expanding awareness by sectors and management criteria under policy framework called 'conservation and wise use' of national wetlands.

※ CEPA action plans: Ramsar Convention's Communication, Education, which aims to promote public awareness of National Action Programs (The Communication, Education, Participation and Awareness programme).

□ Promote pilot projects for reviewing on-site applicability of CEPA action plan

○ Develop jointly recognized development program between the National Wetlands Centre and the individual centers.

○ Develop textbook on wetlands for elementary students and adults.

○ Designate 'Wetlands awareness stronghold Center' in each catchment area for education on wetlands.

□ Continued promotion of international cooperation projects on wetland

○ Share experience and knowledge on pioneering research technology through exchange and cooperation with the American National Wetlands Research Center (NWRC).

○ Promote efficiency in managing "East Asia Ramsar Center."

○ Publicize through side events at international conferences held.

▣ **Performance Indicator**

○ Number of participants in wetlands awareness expanding program

1-6 Secure biodiversity

▣ Status Analysis

□ There is need for a systematic management of biological resources as competition on securing its share intensifies.

□ Secure national competitiveness in fostering BT industries through ensuring biodiversity.

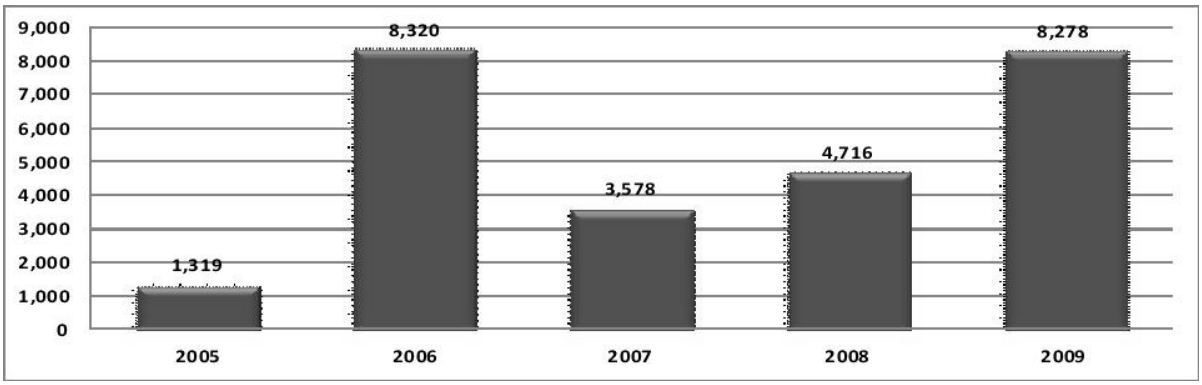
○ More than 50 percent of habitat in Korean Peninsula is reported to be in the DMZ as an area of biological diversity of species.

□ Highlight the importance of the ecological environment as United Nations designate 2010 as the Year of Biodiversity.

○ There is urgency to prepare measures on boosting Korea's low level on ecological welfare.

○ There is reduction in the number and density of wildlife habitat due to wildlife poaching, trafficking, and various development projects.

<Increase trend in number of trafficked and poached animals>



▣ Direction of Promotion

□ for securing biological diversity, biological resources and ecosystems, promote conservation

□ ensuring biodiversity through the eco boost welfare

Indicator	Performance goal		Measurement method
	'10	'15	
Number of national species	36,921	40,000	Peninsula records species (cumulative)
Natural ecosystems, risk assessment results	-	100	(Natural ecosystems, conducting risk assessment / risk assessment plan) x100

1-6-① Ensure diversity of biological resources

< Goal >

Prepare foundation in conserving diversity of biological resources and its systematic utilization

■ Departments organized : Ministry of Environment

■ Cooperating Authorities : Korea Forest Service, Ministry for Food, Agriculture, Forestry and Fisheries

▣ Execution Plan

□ Review support for establishment of professional organizations on biodiversity conservation by catchment areas.

○ Review measures on establishment and management of National Institute of Biological Resources by regions that can research, analyze and manage change in biological research environment and conservation of the endemic and newly collected biological specimens.

○ Establish measures for securing management expertise for operating agencies on biodiversity conservation and agency and register in international sample association. In addition review mid to long-term development plans and measures to nurture biodiversity research base and the Northeast Asian biological resources.

□ Identify and strengthen the management of indigenous species in the Korean Peninsula

○ Identify and confirm the list of non excavated indigenous biological survey of 60,000 kinds.

○ Culminate database and produce illustrated books that compiles endemic and indigenous species of the Korean Peninsula which have been confirmed based on the study through professional agencies on biodiversity conservation and research.

○ Collect samples and data on indigenous species and secure them at the institute of biological resource by regions.

○ Collect supplement of endemic species per sample and produce based on new samples.

○ Produce specialized book in English and Korean containing classification of species, ecological characteristics, distribution, etc. of biological resources.

○ Strengthen export of biological resources overseas and establish international cooperation of government, academia and research institutions for demonstrating and protecting the unique biological resources.

○ Promote basis establishing projects by utilizing biological resources for BT industries and establish system through information and database network.

□ Strengthen management of biodiversity

○ Establish a system for keeping a close watch and cracking down on poaching and trafficking; Build a database and information network management system of a habitual poacher and trafficker.

○ Establish infrastructure (National Wildlife Health Center construction, etc.) for management of wildlife diseases like avian influenza (AI).

○ Promote general public awareness for enhancing wildlife.

○ Authorize larger protected area for conservation of biological resources inhabitation and breeding.

○ Establish and implement detailed management plan that fits the features of inhabitation and breeding of biological resources and specific objectives of each protected areas.

○ Strengthen management of species by utilizing indicator on '100 species of bio-indicators on National Climate Change.'

□ Biological Resources Management

○ Establish basis for systematically utilizing biological resources through implementing "Master Plan on the conservation, management and use of biological resources, (2011-2020)."

○ Establish basis for utilizing biological resources through managing wildlife gene banks, botanical and wildlife culture centers and build infrastructure by practical use of industry-based technology.

▣ **Performance indicator**

○ Number of national species

1-6-② Measures for Ecosystem Conservation in DMZ

< Goal >

Prepare a step-by-step strategy for the conservation of the DMZ ecosystem.

■ Departments organized : Ministry of Environment

■ Cooperating Authorities : Korea Forest Service, Ministry of Unification, Ministry of National Defense, Ministry of Land, Transport and Maritime Affairs

▣ Execution Plan

□ Conservation measures for DMZ ecosystem

○ Establish basic plan on the DMZ Ecosystem Conservation and sustainable use and ensure timeliness of the execution system.

○ Establish and operate strategies for participation of various stakeholders like the DMZ Eco Leadership Center and review support measures and capacity building of local communities.

○ Conduct strategic environmental assessment where there is participation of experts (including military experts) and private organizations on major development projects from the planning phase to promote harmony between conservation and use.

○ Designate the current statutory protected areas to be systematically protected such as areas where endangered plants and animals dwell and cross over, areas of outstanding scenery and ecology, good forest ecosystems and wetlands, etc.

□ Ecosystem Conservation in DMZ

○ Periodically examine the ecosystem of the southern side of the DMZ, and secure specimens in the DMZ Indigenous Species Center under the National Biological

Resources Center. Utilize the DB that was made out of the results in managing genetic resources.

○ Conduct research on DMZ ecosystem through co-phased cooperation of South-North, put efforts for its conservation and peaceful utilization of ecosystem and manage the DMZ under the Natural Environment Conservation Act Article 2 for two years after the unification.

○ After the two years, extend the ecological/landscape conservation area to the whole DMZ by dividing into key zone, buffer zone and transition zone according to their conservation value in order to pursue harmony in conservation and utilization of DMZ.

□ Designate joint UNESCO biosphere reserve of North and South Korea

○ Pursue the designation of joint UNESCO bioshpere reserve of North and South Korea as a long term goal, and exert efforts to make it a major agenda for the North-South environmental cooperation.

□ Education and public awareness communication on DMZ Ecosystem

○ Through the establishment of the DMZ Ecological Research and PR Center, and publish and distribution of educational materials; reach out to the general public, students, soldiers and etc.

- Work towards education and public awareness by using government agencies and private organizations.

▣ **Performance indicator**

○ Results of survey on ecosystem in DMZ members (including in DMZ)

1-6-③ Strengthen Protection of Endangered Plants and Animals

< Goal >

Prevent population decline of wild plants and animals through designating protection zone for protecting the endangered plants and animals, and promoting restoration projects.

■ Departments organized : Ministry of Environment

■ Cooperating Authorities : Korea Forest Service, Ministry for Food, Agriculture, Forestry and Fisheries

▣ Execution Plan

□ Protect natural habitat for endangered plants and animals

○ Perform precise survey on distribution of endangered wild plants and animals for drawing up the distribution chart of endangered species and therefore designate and enlarge the major natural habitat for wildlife protection zone.

○ Build and operate characteristics, formatting, distribution conditions and protective zones of endangered plants and animals into database, and expand civil awareness through creation of brochures.

○ Expand conservation organizations that protect the endangered species and strengthen its support.

□ Actively promote the restoration of endangered species

○ Actively promote the restoration of endangered species by operating restoration centers for endangered species within the National Park Service and the governmental, public and private arboretum.

○ Strengthen cooperation with neighboring countries to restore endangered species and introduce advanced technology related to restoring endangered species.

▣ **Performance Indicator**

○ Results on endangered species restoration

○ Implementation on research of national distribution of endangered species (%)

1-6-④ Strengthen Management of Invasive species that alter ecology

< Goal >

Strengthen the management of invasive species that disrupt ecology through establishing various measures like designating them by ranking according to their intrusiveness.

■ Departments organized : Ministry of Environment

■ Cooperating Authorities : Korea Forest Service, Ministry for Food, Agriculture, Forestry and Fisheries, Ministry of Land, Transport and Maritime Affairs

▣ Execution Plan

□ Establish evaluation mechanisms of invasive species that disrupt ecology

○ Establish ranks according to the disruptiveness of alien species on ecology through basic ecological research and survey of the entire ecosystem.

○ Establish pre-assessment system that can decide on its introduction status by assessing the risk of the foreign species, and survey development of assessment techniques.

□ Strengthen management of invasive species that disrupt ecology

○ Implement management measures by classification by specifying the highly invasive species (50 species) as the "wild animals and plants that alter ecosystem."

○ Design a monitoring system and exchange information between relevant authorities on alien species like the Ministry for Food, Agriculture, Forestry and Fisheries, and Customs Service.

▣ Performance Indicator

○ Survey and monitor species that disrupt ecosystem (%)

1-6-⑤ Risk Assessment of Genetically Modified Organisms to Ecosystem Mechanisms

< Goal >

Strengthen expertise and regulation of organizations that assess ecological risk of genetically modified organisms.

■ Departments organized : Ministry of Environment

■ Cooperating Authorities : Ministry for Food, Agriculture, Forestry and Fisheries, Ministry of Health and Welfare, Korea Food & Drug Administration

▣ Execution Plan

□ Design and operate assessment system on ecological risk of genetically modified organisms

○ Enhance personnel with expertise and regulate the assessment organization on ecological risk of genetically modified organisms.

○ Operate investigative system risk of genetically modified organisms to the natural ecosystem.

○ Establish and operate system for safely managing genetically modified organisms that purify environment, through detailed instructions, regulations, establishment of five-year plans on safety management, detailed annual action plan and promotion of research.

○ Implement data on post-monitoring on genetically modified organisms released into natural ecosystems.

□ Strengthen international cooperation and public awareness on genetically modified organisms

○ Strengthen publicity and education for better understanding of the genetically modified organisms.

○ Protect national interests through maintaining international partnership concerning safe management of genetically modified organisms.

○ Technology transfer on assessment and screening of genetically modified organisms on its risk to ecosystem and build capacity in developing countries at the international level.

▣ **Performance Indicators**

○ Performance on risk assessment of genetically modified organisms in the natural ecosystem

1-7 Sustainable Water Resource Management

▣ Status Analysis

□ There is need to establish a system to regularly analyze, evaluate and alert on change of contaminants and water quality of Major Four Rivers through installation and operation of integrated management center water.

□ There is change in the conditions of water resource management due to climate change like frequent drought, floods and changes in water temperature.

○ Compared to foreign countries, Korea's major rivers flow has a big gap between the minimum and maximum river flow therefore water usage conditions are very poor.

○ There is need to continuously promote measures on flood control at the basin-level dimension in order to prepare in advance extreme flood damage caused by urbanization and heavy rainfall.

○ There is need for efficient utilization and conservation of groundwater and improve ability to manage the drought crisis.

□ Clean and adequate water supply for people and nature

○ Demand efficient use and stably secure water resources.

○ Need to improve business management systems through realizing water value.

▣ Direction of Promotion

□ Promote policy that considers safety and equality in ensuring future water usage.

□ Establish sustainable water usage system and create healthy and clean water environment.

Indicator	Performance goal		Measurement method
	'10	'15	
water quality (BOD, ppm)	1.48	0.95	Four Rivers water pollution (BOD) annual average
water tariff reality ratio	80.1 ('09)	86	(The national average water rates / average production costs) x100

1-7-① Establish Policies on Sustainable Management of Water

< Goal >

Promote advanced system on water management through stable water management base.

■ Departments organized : Ministry of Land, Transport and Maritime Affairs, Ministry of Environment

■ Cooperating Authorities : Meteorological Agency

▣ Execution Plan

□ Maintain comprehensive long-term plan of water resources and water supply forecasts

○ Establish and maintain long-term comprehensive planning of water resources, and solve controversy on water shortage through participation and consultation of relevant stakeholder for establishing rational discussion structure on water supply forecasts.

○ Regularly open to the public the actual conditions like possible supply amount, application amount by utilization, amount reused, and strengthen the management of water related basic statistics through strengthening research capabilities and enabling information exchange.

○ Strengthen to further policies that enhance efficiency on water usage and reduction by introducing target management system on demand, water conservation management system, expanding water recycling, supply of flowing stream and etc.

□ Advance management of major four river restoration and water

○ Establish preventive water quality management system through implementing environmental measures on the major four rivers.

- Strengthen water quality standards on plant discharge and expand waste and wastewater treatment plant facilities for preventing algal bloom.

○ Operate water quality forecasting system and real-time monitoring of the four major river water quality

○ Maintain 20 sites of tributary streams into water circular sites by utilizing rich water obtained through the major four river restoration project.

○ Establish and operate medium to long-term master plan for tributary and abundant water management nation wide.

□ Strengthen management of groundwater

○ Establish basic infrastructure on ground water management through research on facilities and nature of groundwater, expansion of groundwater observation and information network.

○ Strengthen ground water management basis through strengthening measures on development, usage, conservation and management, and expand expertise.

▣ **Performance Indicator**

○ Ratio of good water on the standard BOD of 114 mid-scale watershed (%)

○ Amount of polluted river water (BOD, ppm)

1-7-② Expand the reliable supply of water resources

< Goal >

Enlarge the system on reliable water production and supply through resolving inter-regional imbalances in water supply and enhancing water quality.

■ Departments organized : Ministry of Environment, Ministry of Land, Transport and Maritime Affairs

▣ Execution Plan

□ Expand supply of safe drinking water

○ Balanced and stable supply of tap water

- Provide a reliable water supply system through plans to expand sustainable water supplies in the rural and insular areas.
- Expand the demonstration projects on integrated operation of local water supply.
- Operationalize management of related interagency council for preventing over-investment on duplication of facilities between regional water and the local constant, and promote facility utilization.
- Promote pipeline linkage businesses between the Wide - Wide, wide-fat, fat-tail linkages to cope with pipeline accidents, droughts and water accidents.
- Promote rehabilitation of pipeline for a stable water supply

○ Establish real-time management system on water quality and highly advanced water treatment.

- Expand highly advanced water treatment facilities through revising evaluation guidelines (2009) and introducing water treatment facilities.

- Real-time system for management of water quality and quantity.
  - ▪ Enhance water safety that conducts quality monitoring conducted in conjunction with water supply source, water purification plant, reservoir, conduit, tap water quality data.

○ Implementation of Phase II and enlarge maximum load system of water pollution.

- Installation and operation of the Major Four Rivers Integrated management center for water quality for management of regular analysis and assessment on water changes, and early warning system.
- Reduction of water pollutants through implementation of the Phase II Management of Total Water Pollutant.

○ Promote management of drinking water quality

- Promote continuous monitoring of unregulated hazardous micro-substances.
- Expand surveillance and additional items such as drinking water quality standards (monitoring).
- Implement regular monitoring of water quality status on rivers and aquatic ecosystems of public water areas.

○ Ensure safety on drinking water at vulnerable areas

- Continue to improve the business on improving water quality standards in aging small-scale facilities (of village water supply, small-scale water supply facilities) and therefore expanding water safety in agricultural and fishing areas.

□ Secure diverse water resources

○ Diversify water resources like filtered river water, seawater desalination, drinking only water resources development, ground dam etc.

○ Design various support measures around dam for securing against climate change and dam construction in undeveloped areas.

○ Ensure reliable ground water through artificial cultivation of stable water supply during drought and flood caused by climate change.

▣ **Performance Indicator**

○ Rural Water penetration (%)

○ Rate of constructions of highly water treatment facilities (%)

1-7-③ Strengthening Sewage Treatment facilities and management

< Goal >

Create a clean and safe water environment through sewer system improvements and expansion of sewage treatment plants.

■ Departments organized : Ministry of Environment

▣ Execution Plan

□ Promote efficient sewer maintenance system

○ Expand integrated maintenance and dissemination of wastewater and sewer plants.

○ Propose for policies on reduction of watershed point sources around Saemangeum and urban areas.

○ Strengthen surveillance of completed BTL business of sewer maintenance.

□ Enhance maintenance of sewage to ensure safe water supply

○ promote the advance business on public sewage treatment facilities and early expansion of major 4 river basin sewer facilities.

○ Advance sewage penetration and wastewater operation management through integration of small sewage in rural areas.

□ Enhance prevention of sewer flooding

○ Enhance sewage advancement through strengthening preventive features on flooding during heavy rains.

- Raise the frequency of rainfall probabilities of Sewer and rainwater pump (10 years or less → 10 ~ 50 years) and revise maintenance instructions.

▣ **Performance indicator**

○ Penetration rate of sewer pipe (%)

○ Penetration rate of sewer system in rural areas (%)

1-7-④ Expand development of green alternative water and water reuse

< Goal >

Foster greater efficiency of water management policy through alternative water demand management.

■ Departments organized : Ministry of Environment

▣ **Execution Plan**

□ Develop alternative eco-friendly water industry

○ Strengthen institutional framework for the promotion of water recycling and water reuse basic plan.

○ Foster for specialized training of water reuse by establishing new categories of professional qualifications like in designing and contracting facilities of reuse of treated water and wastewater industries.

○ Raise standards through enhancing quality of sewage treated water and for creating demand on reuse.

○ Expand standards of reused sewage treated water with purpose of maintaining public interest such as agricultural water, river water.

○ Secure investment funding and expansion of technology by introducing private investment on reuse of treated wastewater (industrial water).

○ Expand the standard of target for installation of water facility and rainwater use facilities.

○ Expand water reuse facility mandated targets (multi purpose facilities for public nature of the water).

□ Maintain institutional incentives for demand management

○ Activate incentive scheme on water reuse and water conservation.

▣ **Performance Indicator**

○ Rate of reused sewage treated water (%)

1-7-⑤ Water demand management mechanisms through realization of water value

< Goal >

Expand efficiency and equity of water management system through improving water pricing system including introduction of rate determining measures.

■ Departments organized : Ministry of Public Administration and Security, Ministry of Environment, Ministry of Land, Transport and Maritime Affairs

■ Cooperating Authorities : Local government

▣ **Execution Plan**

□ Prepare reasonable water pricing system

○ Introduce reasonable rate setting system for adjusting rate determination and system adjustment.

○ Realize the progressive system that considers type of business and customer distribution chart, corporate rate system and convert the inefficient meterman system to automatic meter-reading and remote meter-reading.

○ Improve the reporting system for transparency and serviceableness of accounting information and disclose income item of importance like facility development revenue as supplementary schedules.

○ Prevent excessive burden on consumers by preventing excess Capital investments in water and distribute production costs by intergenerational fairness and thereby bringing economic justice.

□ Secure reliability of statistics on water supply

○ Carry out disciplinary action for false report and procedures on verification of water supply statistics.

○ Make it obligatory that after measuring, to disclose on a regular basis, the operator's management skills, service levels, water quality, etc.

▣ **Performance Indicator**

○ Reasonable rates of tap water (%)

○ Water consumption per capita (ℓ/day)

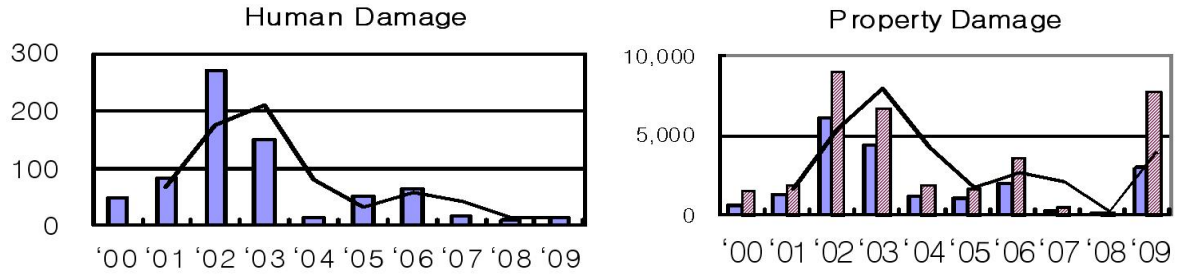
1-8 Sustainable Prevention of Natural Disasters

▣ Status Analysis

☐ There is a deepening trend globally with events such as average temperature rise, drought, flood, extreme weather events.

○ Natural disaster of average 12 times a year such as rain storm

<The trend in natural disasters changes last 10 years (2000-2009) >



☐ There has been decreasing trend of natural disasters over the past five years, however the long-term trend of climate change reveals a large-scale potential disaster.

○ The average annual frequency of torrential rain of at least 80 ㎜ per hour was 37 days in 2000's and increased to 1.7 times compared to in 1970's which was 22days. The national average rainfall in 2009 has far exceeded (186.3%) to 490.6 ㎜ normal years of precipitation (263.4 ㎜).

▣ Direction of Promotion

☐ Minimize the damage caused by natural disasters through proactive and efficient disaster response system and the establishment of disaster recovery systems.

☐ Build system to address natural disaster prevention measures that considers climate change.

Indicator	Performance/goal		Measurement method
	'10	'15	
Natural disasters (person/ 100 million won)	14 / 4,267	12 / 2,984	Life and property damages caused by natural disasters (most recent five-year average)

1-8-① Building National Disaster Response System

< Goal >

Strengthen management system of disaster situation to effectively manage disaster caused by flood damage.

■ Departments organized : Ministry of Land, Transport and Maritime Affairs, National Emergency Management Agency

■ Cooperating Authorities : Meteorological Agency

▣ Execution Plan

□ Strengthen management systems against extreme weather disasters

○ Develop system upgrades for the management of disaster situations.

- Create a system and manuals to deal with extreme disaster environments.

○ Ensure substantiality in operating various disaster information management and promote efficiency of situation management.

- Establish database on disaster information of city, district and relevant organizations of their own.
- Identify, organize and standardize the R & D technology on disaster prevention of city, district and relevant organizations.

□ Establish alarm forecasting system against local disasters such as torrential rains

○ Apply advanced IT technologies on technologies that deliver alarm forecasting system.

○ Improve accuracy of early warning and forecasting system and its technologies.

□ Establish information system against climate change, urban life, health system of cities.

○ Develop efficient delivery technology of early warning and forecasting system that applies IT technology, high-resolution urban health alert system.

□ Introduce total flood management

○ Review alternative measures to the viable flood protection that considers flood handling, dimensional stability, increased economic efficiency and share appropriate share of flood around watershed areas.

□ Establish consumer-oriented flood forecasting system

○ Develop 'smart' flood management system that provides flood forecast and its results.

○ Convert into GIS-based propulsion system utilizing radar in the rainfall forecast according to areas.

□ Produce 'flood risk map' on the flood prone area

○ Produce flood risk map on estimated vulnerable districts and flood prone areas targeting the national river (2,332 km excluding dam submerged areas).

▣ **Performance Indicator**

○ Life and property damages caused by natural disasters (average of recent five-year)

○ Improved performance on repair

1-8-② Improve disaster recovery system to prevent repeated damage

< Goal >

Promote efficient disaster recovery system to prevent reoccurrence of damage.

■ Departments organized : National Emergency Management Agency

▣ Execution Plan

□ Enhance port recovery schemes for eliminating the cause of fundamental damage

○ Expand improvement on recovery projects including disaster recovery planning of regions with risk of collapse and the regions of as indicated in comprehensive plan on flood risk reduction of cities, counties and boroughs.

○ Establish and implement comprehensive recovery plan centered around large, complex disaster area.

- Promote harbour recovery projects and solve fundamental cause during complex disaster of roads, rivers and landslides from flood, etc.
- Amend law on natural disaster countermeasure by introducing comprehensive recovery system in district units.

□ Prepare reserve standard to efficiently manage disaster relief supplies

○ Prepare reserve for storing disaster relief supplies.

- Establish scientific and qualifiable criteria of disaster relief reserve reflected in certain disaster characteristics of regions.
- Reorganize the disaster criteria periodically by its characteristics in regions.

○ Prepare baseline on storage of disaster relief supplies.

- Establish aid per set disposal criteria considering its shelf-life.
- Re-secure disposal measures when shelf life exceeds.

□ Establish management in preparation for extreme natural disaster and disaster victims, and management system for information on disaster relief

○ Develop information management system on real-time occurrence of victims.

- Establish a shared system on victim occurrence which can be displaced among central, municipal, national, and interagency disaster relief organizations.

○ Develop a management system on disaster relief supplies that utilizes IT technology.

- Build an automatic system on creation, storage and payment of disaster relief supplies.
- Share real-time information and material relevant on disaster and supplies between the related agencies.

▣ **Performance Indicator**

○ Enhancement rate on disaster recovery management system (%)

1-8-③ Prevention of Climate Change Caused Disasters

< Goal >

Prevent disaster damage from climate change by promoting preventive programs in the disaster risk regions.

■ Departments organized : National Emergency Management Agency

▣ Execution Plan

□ Promote maintenance project in disaster risk districts

○ Resolve fundamental risk factors against climate change.

- Suppress the land acquisition of newly flooded areas as simple agricultural drainage pumping station and utilize as reservoir space.

□ Actively promote improvement projects for safe and eco-friendly small river.

○ Vitalize application of maintenance technologies to enable environmental friendly small rivers.

○ Analyze and make database on risk of small rivers for dimensional stability.

○ Continuously promote small river improving projects (41.2% in 2010).

□ Promote early maintenance of steep slope-land and aging reservoirs

○ Promote maintenance of steep slope-land caused by increased urbanization and industrialization.

- Target 1,605 collapse risk areas (including 482 housing need urgent maintenance, roads etc. and 1,123 areas).

○ The local government need to manage systematic maintenance and reinforcement of the old reservoirs of the risk ridden regions.

▣ Performance Indicator

○ Disaster prevention early contract rate (%) and early construction rate (%)

※ In February 2011, 90% were got the order among the project targets and in late June, 60% were completed.

1-8-④ Stable Settlement of Consumer-driven Insurance on Flood Damage

< Goal >

Supply government support system on restoration expenses from flood damage and establish insurance program for autonomously instilling disaster prevention awareness to residents.

■ Departments organized : National Emergency Management Agency

■ Cooperating Authorities : Ministry of Strategy and Finance

▣ Execution Plan

□ Establish infrastructure for the activation of flood damage insurance

○ Establish database for calculating the premium rates.

- Identify the status, scale and victims from damage considering the characteristics of flood risk by regions and facilities.

※ (The current facility covered by insurance) housing, greenhouse
(For future extension of coverage target facilities) plants and shopping areas, mushrooms and ginseng cultivation facilities, and warehouses (including facilities), etc.

□ Expand coverage and product competitiveness on flood damage insurance.

○ Improve product competitiveness through improving flood damage insurance system.

- Establish improvement measures through consultation from residents, local governments, insurers and etc.

○ Set up 'earthquake' as disaster covered by flood damage insurance.

▣ Performance Indicator

○ Subscription rate of the flood damage insurance for housing and greenhouse (%)

1-9 Education and Public Relations for Sustainable Development

▣ Status Analysis

□ There is universal tendency for major industrialized countries to practice environmental friendly ecological culture through the spread of green movement like green consumption and green living.

○ With the strengthening of environmental regulations and change in its awareness, there is spread of sustainable consumption and production.

- At the Tesco of UK, since 2008, more than 20 brand products were displayed with 'carbon footprint' marks.

○ There is need for a strategic approach for sustainable growth and diffusion of environmental friendly ecological culture.

- The 'eco-mom' practice of United States and the British 'eco-driving' practice are exercised for green living.

□ There is lack of infrastructure to attract voluntary participation of green living practices.

○ Various green life enforcement campaigns are done by the authorities, however there is lack of a concrete action plan and implementation programs to be enforced in detail.

○ There is unclear incentive plans to encourage green living practices and specific environmental and economic benefits achieved from such practice.

○ There still exists special recognition by citizens nation wide that green living is separated from everyday life.

□ In order to strengthen education for sustainable development, United Nations has declared 2005 to 2014 as 'Decade for Education for

Sustainable Development (UN Decade of Education for Sustainable Development, UNDESD).'

○ Korea also prepared the 'practices of Education for Sustainable Development' and established the Korea Committee on UNESCO Education for Sustainable Development (2009.9).

▣ Direction of Promotion

□ Promote implementation of sustainable development through education and publicity.

□ Find ways on sustainable future through individual practice of sustainable development.

Indicator	Performance goal		Measurement method
	'10	'15	
Developing Education for Sustainable Development Performance	-	13	Sustainable development portal site (ncsd.go.kr) Number of training programs established

1-9-① Establishment of Education basis for Sustainable Development

< Goal >

Establish systematic implementation of education for Sustainable Development.

■ Departments organized : Ministry of Environment

■ Cooperating Authorities : Ministry of Education, Science and Technology, Ministry of Strategy and Finance

▣ Execution Plan

□ Establish education basis for sustainable development

○ Establish development plan for systematically promoting sustainable development.

○ Increase support for education on sustainable development which is done by municipalities, private sector and citizens groups.

□ Build leadership for education on sustainable development

○ Enhance leadership for strengthening education on sustainable development.

- Promote establishment of courses on sustainable development for training programme for teachers of elementary, middle and high school.

○ Establish international leadership through implementing internationally the UN 10 Years of Education for Sustainable Development (UNDESD).

□ Strengthen the role of Board of the UNESCO Education for Sustainable Development in South Korea

○ Monitor national strategies and status by utilizing professional organizations on strategies and status education established within Korea Committee for UNESCO Education for Sustainable Development.

○ Promote activation of "Certification System on official project of UNESCO's Education for Sustainable Development."

▣ **Performance Indicator**

○ Performance on development of education for sustainable development program

1-9-② Promote Publicity basis on Sustainable Development

< Goal >

Spread awareness on sustainable development through publicity activities that utilizes information network from sustainable development experts.

■ Departments organized : Ministry of Environment

■ Cooperating Authorities : All departments

▣ Execution Plan

□ Establish basis for spreading awareness on sustainable development.

○ Establish and operate information network on sustainable development for its publicity.

○ Enhance support on policy research on sustainable development.

○ Promote pilot projects and, identify and spread best practices of sustainable development.

□ Develop advertising activities that utilizes the experts on sustainable development.

○ Select leading figures in each sector for inducing sustainable development.

○ Select and award experts who receive public attention as ambassadors of sustainable development to promote participation on sustainable development activities.

▣ Performance Indicator

○ Usage on Sustainable Development Information Network

1-10 Strengthen International Cooperation for Sustainable Development

▣ Status Analysis

□ As the position of Korea has changed from a recipient country to a donor country, Korea is required to take a larger role in ODA for developing countries.

□ Meanwhile, there is need to increase green ODA to meet the simultaneously expanding vulnerability to climate change and poverty in developing countries.

○ Through '2006 OECD Declaration on climate change adaptation and coordination of development,' OECD Development Assistance Committee (DAC) emphasized that climate change issues to be consisted in all the development.

○ Korea is one of the rare countries that have achieved high economic growth while preserving environment.

○ It is concluded that Korea's green growth experience can contribute to environment and economic growth in developing countries when implementing ODA projects.

□ Need to strengthen international cooperation network for sustainable development of the developing countries.

○ At the 2002 World Summit on Sustainable Development, the "WSSD Plan of Implementation" was adopted containing the direction towards sustainable development practices for the countries in the 21st century.

○ With 2004 UNEP Special Session on Sustainable Development was instrumental for the establishment and operation of national institute of sustainable development (NISD) in 2005.

※ NISD: Perform sustainable development of developing countries, and international cooperation projects on environment.

▣ Direction of Promotion

□ Strengthen international cooperation network and expand green ODA for supporting development of sustainable development in developing countries.

Indicator	Performance goal		Measurement method
	'10	'15	
ODA to GNI ratio (%)	0.12	0.25	ODA compared to GNI ratio (%)

1-10-① Strengthening International Cooperation Network for Sustainable Development

< Goal >

Establish network on international cooperation for sustainable development and support sustainable development in developing countries.

■ Departments organized : Ministry of Environment, Ministry of Knowledge Economy, Ministry of Education, Science and Technology

▣ Execution Plan

□ Strengthen international capacity of Commission on Sustainable Development.

○ Support strategic planning and evaluation of sustainable development in developing countries.

○ Develop policy models and research case studies on international cooperation on sustainable development.

○ Strengthen implementation of international agreements on sustainable development.

□ Build collaborative partnerships

○ Maintain cooperation and partnership with international organizations (UNCSD, OECD, etc.).

- Bridge the gap of International Information Programs of international organizations (ITU-D, WG, WSIS, etc.) participates.

○ Through the establishment UN Office on Sustainable Development, strengthening pacific cooperation on sustainable development.

- Provide access to information resources, facilities, library, web-based educational platform (knowledge portal) on sustainable development policies.

□ Continuously promote North and South Korea cooperation projects for peace

○ Increase adaptive capacity of the peninsula to climate change, ecosystem preservation, establish joint response system on natural disaster and promote cooperative projects.

□ Expand cooperation in green technology and industries.

○ Promote "Green Technology for All" initiative for the global spread of green technologies in developing countries.

○ Develop green technology transfer through vocational, educational and training programs.

▣ **Performance Indicator**

○ Result on support sustainable development in developing countries

1-10-② Promote Expansion and Greening of ODA (Official Development Assistance)

< Goal >

Support green economy in developing countries through expansion of ODA.

■ Departments organized : Ministry of Foreign Affairs and Trade, Ministry of Strategy and Finance

■ Cooperating Authorities : All departments

▣ Execution Plan

□ After joining the 2010 OECD Development Assistance Committee, expand ODA in quantity and quality.

○ Put efforts to reach 0.25% level of ODA compared to GNI ratio by 2015.

- ODA / GNI (%): (2008) 0.09 → (2012) 0.15 → (2015) 0.25

○ Continuously expand the proportion of non-ODA assistance in accordance with the recommendation of Development Assistance Committee (DAC).

- Increase non-property ratio of ODA to the level of 75% by 2015.

□ Increase green ODA

○ Increase the proportion of ODA-related projects on green economy in developing countries by 30% by 2020.

- Green ODA proportion (%, bilateral): (2007) 11% → (2013) 20% → (2020) 30%

○ When implementing ODA policy-making and business promotion on climate change, review and reclassify green economy as a cross-cutting artifact.

□ Expand donations through multilateral institutions

○ Increase contributions for funds on UN global environmental financing (GEF).

○ Participate through contributions in World Bank Climate Investment Fund and ADB Environmental Fund.

▣ **Performance Indicator**

○ ODA to GNI ratio (%)

2 Adaptation to Climate Change and Response Mechanisms

2-1 Reduction of Greenhouse gas emissions by sector for carbon reduction

▣ **Status Analysis**

□ There is increase in crisis due to climate change and unstable energy supply.

○ There is need for spread of international community movement on reduction of greenhouse gas emissions.

- Strengthen international regulatory and mandatory reductions of greenhouse gas diffusion participate.

○ Unstable energy supply and price instability.

- There is continuous rise in the world energy demand and supply shortages as well as unrest in the energy market.

○ There is need to face effective reduction of greenhouse gas emissions and enhance energy independence challenges.

□ Korea's domestic greenhouse gas emissions and energy consumption has relatively risen in the world.

○ Korea has world's highest in the average annual growth rate of energy consumption (1985-1995) of 10.3 %.

○ Korea was 6th in Absolute green house gas emissions among the OECD countries (2009 year basis) in1990, as well as the world's highest emissions rate.

□ In 2009, Korea announced a long-term greenhouse gas reduction targets.

○ To reduce 30% of greenhouse gas emissions projections (BAU) by 2020.

○ Currently, under the 2010 'Framework Act on Low Carbon, Green Growth', there are the energy target management system is under way with 458 companies.

<Greenhouse Gas Emissions Reduction Plan by the country>

Country	Plan
Korea	Reduce 30% compared to Business As Usual (BAU) by 2020
Japan	Reduce 30% compared to the level of 2005 by 2020 (25% reduction compared to the level of 1990) (September 22, 2009, Yukio Hatoyama, Japanese Prime Minister, UN Summit)
UK	("Act on Climate Change" took effect in Nov. 2008) Reduce at least 26% compared to the level of 1990 (April 2009, Ministry of Finance) reduce 34% compared to the level of 1990 (July 2009, Ministry of Climate Change and Energy) Reduce 36% compared to the level of 1990 (Low Carbon Transition Plan submitted to the Cabinet)
US	Reduce 17% compared to the level of 2005 by 2020 (4% reduction compared to the level of 1990) Stipulated in 'Waxman-Markey Legislation' which was passed in the House in June, 2009
Australia	Reduce 5-15% compared to the level of 2000 by 2020, If Australia participates in global efforts, reduce 25% Stipulated in Carbon Pollution Reduction Scheme (CPRS), which is underway
South Africa	Unclear mid-term goal, focusing on long-term plan Declared theoretically possible goal of reducing 30-40% compared to the level of 2003 by 2050, scenario to achieve benefits is under review. In October 2007 the joint private public and industry team for long-term reduction amount announced the goal through the report.
Canada	Reduce 20% compared to the level of 2006 by 2020
EU	Reduce 20% compared to the level of 1990 by 2020 and if it participates in global efforts, reduce by 25% It is recommended that country-level reduction amount shall be determined on its own considering GDP Stipulated in "20-20-20 comprehensive act on climate change" in December 2008 (implemented in April 2009) 20-20-20 : Reduce 20% of greenhouse gas emission by 2020 and expand the ratio of renewable energy by 20%
Brazil	It has not presented clear figures, but review the goal to maintain the amount at the level of 2005 by 2020
India	It cannot accept the mandatory reduction at a certain level
China	It is not possible to set mid-term reduction goal without the assumption that advanced countries will reduce 40% by 2020
Russia	Reduce 10-15% compared to the level of 1990 by 2020, announced by President Medvedev in June, 2009 (press conference)

▣ Direction of Promotion

□ National long-term greenhouse gas reduction goals to reduce greenhouse gas emissions by sector for the implementation.

□ Sector to reduce greenhouse gas emissions through the promotion of a proactive response to climate change capacity building.

Indicator	Performance goal		Measurement method
	'10	'15	
Greenhouse gas emissions per capita (tCO2)	12.5 ('09)	8	Total greenhouse gas emissions / total population
Practice guidelines to reduce greenhouse gas emissions and greenhouse gas reduction effect of a larger business analysis	5	45	Practice guidelines in consultation business (with drift-up areas) and Greenhouse Gas Reduction Survey

2-1-① Promotion of greenhouse gas emissions reduction by sectors

< Goal >

Identification of effective reduction of greenhouse gas emissions based on the voluntary participation of industry to achieve greenhouse gas emissions targets.

■ Departments organized : Ministry of Knowledge Economy

■ Cooperating Authorities : Ministry of Environment

▣ Execution Plan

□ Strengthen voluntary reduction by industries without hampering with the given industrial structure and industrial competitiveness.

○ Promote step by step to enhance voluntary and performance management system.

- Promote the measurement, reporting and verification system and government convention system that includes incentives and penalty through setting up and managing the greenhouse gas reduction targets.

○ Establish measures in conjunction with the promotion and support of government for cost reduction, industrial process improvement and increasing alternative fuel such as biomass, waste resources.

□ Review and implement government support and effective reduction measures by effectively identifying diagnostic consulting firms on greenhouse gas emissions reduction measures.

○ Support diagnosis and investment on energy (tax credits, low-interest loans, etc.), ESCO (Energy Service Company: investment firms specializing in energy conservation facilities) activate business concerned.

○ Especially, expand support for technology development and dissemination of energy-saving equipment the facility.

○ In particular, promote investment and additional funding for small and medium-sized enterprises which are relatively weak in dealing with climate change.

▣ **Performance Indicator**

○ Rate on achieving the greenhouse gas reduction target of industrial sector (%)

2-1-② Promote greenhouse gas emissions reduction in the building sector

< Goal >

Promote reduction of greenhouse gas emissions in the construction sector through the utilization of highly effective appliances, renewable energy, energy management systems.

■ Departments organized : Ministry of Land, Transport and Maritime Affairs

■ Cooperating Authorities : Ministry of Knowledge Economy, Ministry of Environment

▣ **Execution Plan**

□ Reduction of greenhouse gas emissions at every stage from building design, construction and maintenance.

○ Strengthen low-carbon design criteria for new construction and renovation, and expand incentives for Green Home and Green Building.

- Promote use of windows, enhanced insulation, natural lighting, ventilation, use energy efficient materials, water conservation, and strengthen energy related regulations like on conservation and renewable energy use, design standards, and total energy quantity.
- Strengthen energy design standards to the level of building in EU countries and introduce system of total energy consumption.
- Increase the subject that applies green building certification system such as energy efficiency rating certification, eco-friendly building certification and extend it to be mandatory within certain size.
- Mitigate building regulations (FAR, etc.) concerning low-carbon building construction, renovation construction and review subsidy support.

□ Energy conservation at the phase of building maintenance

○ Promote prevention and expansion of energy conservation through

expanding "Building Energy Management System (BEMS)" which utilizes IT systems and rationally limit indoor air-temperature limit of public buildings and multi-use facilities.

□ Promote rational use of energy that eradicate low efficiency equipment, replaced by high-efficiency equipment.

○ Promote use of efficient lighting fixtures like replacing the bulb to the LED light bulb.

○ Reinforce criteria that expands efficient equipment (home appliances, office equipment, heating equipment, etc.), and review on increasing subsidy and support for high-efficiency equipment.

○ Expand energy-saving diagnosis for energy saving lifestyle and strengthen education and publicity.

□ Induce active use of renewable energy

○ Introduce building certification system for installing incentive schemes on renewable energy facilities of the private sector.

- Certify as building that uses renewable energy when it supplies beyond a certain rate of energy supplied as renewable energy.
- Relieve building standards and devise measures in taking incentives such as local tax exemption.

○ Make it obligatory for public buildings that are newly built and renovated to use estimated rate of renewable energy.

- Currently expanding or remodeling new public buildings have a mandate to use a certain percentage of the total building construction cost (5%) for renewable energy facilities.
- Improve the system to use at least 10% of total energy used in renewable energy facilities.

▣ **Performance Indicator**

○ The rate of enhancing the insulation of windows and doors of buildings (%)

2-1-③ Promote greenhouse gas emissions reduction in the transport sector

< Goal >

Reduce greenhouse gas emissions through reorganization transportation system and expanding green card penetration.

■ Departments organized : Ministry of Environment, Ministry of Land, Transport and Maritime Affairs

■ Cooperating Authorities : Ministry of Knowledge Economy, Ministry of Public Administration and Security

▣ Execution Plan

□ Reorganize into low-carbon transportation and logistics

○ Expand transit and convenient facilities of central bus lanes for enabling public transportation like buses, subways, etc.

○ Sustainable promotion of building high-speed rail road construction projects nationwide like Kyungbu, Honam high-speed rail road, high-speed metropolitan areas, including high-speed rail road network.

○ Realize eco-friendly railway by switching to a vision of the iron lines and diesel and electric vehicles through electrification projects.

○ Expand use of bicycles through enlarging bike paths and bicycle storage facility.

○ Enlarge promotion of Intelligent Transportation Systems (ITS) that merges IT and advanced transportation technologies.

□ Strongly promote expansion of low-carbon, high-efficiency vehicles

○ Introduce advanced level of greenhouse gas emission standards for vehicles and promote greenhouse gas reduction policy initiatives.

- Since 2012, EU has set vehicle emissions standards as 130g/㎞.

○ Promote technology development and expansion of low-carbon green car.

○ Promote legal and institutional measures to expand devices that limit pollution and can be disseminated within short period of time like hybrid and electric vehicles.

※ Green Car dissemination objectives: (2010) 50 thousand → (2015) 195 thousand (cumulative)

○ Enhance development technologies for future Green Car (Fuel Cell Vehicle, etc.).

○ Review various incentives for expanding demand for automobiles with low emissions of greenhouse gases.

○ Induce demand for green cars, compact cars and low emission cars by reviewing according to the tax reform, subsidies and charges according to greenhouse gas emissions.

- Review establishment of comprehensive measure such as Low-carbon car purchase incentive payments (Low carbon Automobile Purchase Incentive).

□ Activate eco-economic driving (eco-drive)

○ Develop and disseminate pollution preventing facilities and environmental friendly safe devices etc.

- Activate use of entry-level support devices for eco-driving (CO_2 emissions, such as mileage display).

- Conduct expansion of low fuel consumption on a continuous descent approach (CDA) when air landing.

○ Educate and publicize on enhanced eco-driving

- Develop and educate driving program and operate installation of virtual experience.

▣ **Performance Indicator**

○ Share of metropolitan public transport (%)

○ Green Car distribution

2-1-④ Promote greenhouse gas emissions reduction in the waste sector

< Goal >

Reduction of greenhouse gas emissions through energy recovering and recycling of waste.

■ Departments organized : Ministry of Environment

▣ Execution Plan

□ Expand energy recovery and waste recycling

○ Expand the facilities on energy recovery from waste like pre-treatment facilities, refuse-derived fuel (RDF) boilers, bio-energy gasification facilities from food waste water, so as to expand electricity generation through the heat recovery and utilization of landfill gas electricity of existing incinerator and heat supply.

○ Disseminate related facilities on providing waste energy efficiency and secure economic feasibility.

- Promote installation of waste resources-energy facility and pre-treatment facilities that can recovery at least 40% of energy of combustible and organic waste through comprehensive environment and energy complex in pilot metropolitan towns.

□ Develop model of low-carbon green village

○ Promote "Low Carbon, Green pilot villages" that utilizes organic waste resource, natural energy and biomass from the region into energy.

▣ Performance Indicator

○ Ratio of resources recovered to energy (%)

2-1-⑤ Promote greenhouse gas emissions reduction in the food, agriculture, forestry and fisheries sector

< Goal >

Reduce greenhouse gas emissions that occurs when production and consumption of food products from agriculture, forestry and fisheries.

■ Departments organized : Ministry for Food, Agriculture, Forestry and Fisheries

■ Cooperating Authorities : Rural Development Administration

▣ **Execution Plan**

□ Promote reduction of nitrous oxide and methane gas emissions in the sector of food, agriculture, forestry and fisheries.

○ (Agriculture sector) In order to reduce emissions of nitrous oxide, inhibit use of nitrometer fertilizer and expand the supply of organic fertilizers, as well as compose eco-friendly agriculture production base.

○ (Livestock sector) In order to reduce methane gas emissions, develop ruminant enteric fermentation technology and promote energy and resource recovery from cattle manure.

○ (Food sector) Develop technology on reducing carbon emissions that arises during production, distribution and consumption of food and develop environmentally friendly packaging technology for food preservation and expanding shelf life.

○ (Fish sector) Develop and provide carbon emissions reduction system according to fishing boats and track fish processing plant survey on carbon emission.

□ Promote agricultural energy conservation and renewable energy

○ Provide horticultural facilities energy savings and renewable energy facilities

- Designate selected high-efficiency heating system and promote education and publicity on energy conservation.

▣ **Performance Indicator**

○ Greenhouse gas emissions reduction rate in agriculture, forestry and fisheries sectors (%)

○ Chemical fertilizers (N, K, P) usage (㎏ / ha)

2-2 Transparency of Carbon Emissions Source

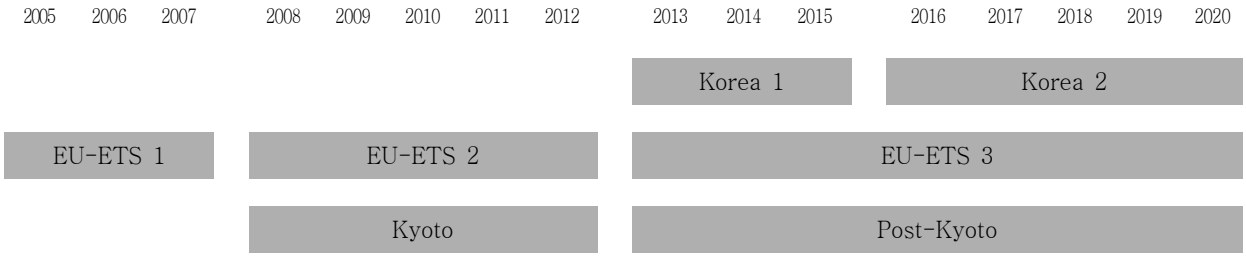
▣ Status Analysis

☐ Following the announcement of national long-term greenhouse gas emission reduction targets in 2009, the reductions by sectors has emerged as major task.

☐ In 2009, the basic law was enacted as a legal basis for a variety of measures to reduce greenhouse gas emissions.

○ It is expected that as from 2015, emissions trading scheme will be conducted which will become a principal means of reducing greenhouse gas.

〈Schedule of Emissions Trading Scheme introduced in Korea 〉



☐ In order for the operation of Emissions Trading Scheme and sectoral emissions reduction to be functional, there is need to provide and disclose accurate information on the carbon emission sources.

▣ Direction of Promotion

☐ Promotion of information available on greenhouse gas through accuracy and transparency of the carbon emissions information.

☐ Provide infrastructure for National Statistics on greenhouse gas emissions.

Indicator	Performance goal		Measurement method
	'10	'15	
Number of carbon labeling certification items	50 ('09)	700	Production of distribution: consumption, greenhouse gas emissions through the entire process, display items
National greenhouse gas total system performance (%)	-	100	Whether a comprehensive system for national greenhouse gas

2-2-① Development and management of Disclosure Indicator on Carbon

< Goal >

Spread consensus on reducing greenhouse gas emissions through developing and disseminating indicators of carbon.

■ Departments organized : Ministry of Environment

■ Cooperating Authorities : Ministry of Knowledge Economy

▣ Execution Plan

○ Establish and set out management goals on Carbon Disclosure Index (Carbon Visibility Index) for raising public awareness on carbon emissions.

○ Disclose carbon information by sectors (products, home, etc.) and target-specific (corporate, public, etc.) to the public, and develop carbon disclosure index by using index on correspondence and perception on climate change.

○ Compose propulsion system across nation, set up carbon disclosure goals by departments such as buildings, homes, and develop its management plan.

▣ Performance Indicator

○ Index of companies responding to climate change

2-2-② Promote active disclosure of carbon information by division and targets

< Goal >

Induce public participation and participation in carbon reduction through increasing the information on carbon disclosure by sectors.

■ Departments organized : All department

▣ **Execution Plan**

□ Expand information on carbon by sectors like products, services, homes, buildings, etc.

○ (Products and Services), Expand the carbon labeling system that displays carbon emissions by sectors for the entire process from production, consumption and disposal of products and services.

- Voluntary display by companies on various nature of their products, energy efficiency rating (CO_2 combined notation) certification, various carbon point grades, such as expanding labeling operations, food milage, and carbon labeling on fisheries and agricultural food.

○ (Home, buildings), Make the carbon grading mandatory and provide carbon-meters that allows real-time the carbon footprint at homes and buildings.

□ Activate public disclosure on carbon information targeting businesses and the public.

○ Expand voluntary and mandatory carbon disclosure of a company through CDP (Carbon Disclosure Project) activation, and report system.

○ Establish national propulsion system and develop management plan and disclosed goals on carbon information by sectors like products, buildings, homes.

○ Enhance corporate social responsibility and conduct survey and present index on responding to climate change targeting energy companies in order to extend their voluntary participation.

- Announce research on energy efficiency, greenhouse gas emissions intensity and reduction technology of companies of high energy consumption as they respond to climate change.

○ Develop and publish climate change perception index to help raise public awareness of general public on climate change.

▣ **Performance Indicator**

○ Number of carbon labeling certification items

2-2-③ Establish and operate national statistics on greenhouse gas emissions

< Goal >

Manage greenhouse gas emissions-related statistics by meeting the standard of international greenhouse gas inventory that has public confidence.

■ Departments organized : Ministry of Environment

■ Cooperating Authorities : All department

▣ Execution Plan

□ Establish national inventory system of international standard

○ Establish and operationalize national system that meets international standards that as required by UN (UNFCC).

○ Prepare basis for National Greenhouse Gas Inventory Report (National GHG Inventory Report, NIR) of post-2012 system.

○ Establish sectoral inventory system and improve statistical estimation methodology on sectors such as energy, buildings etc.

□ Establish development, validation, and management practices of emission and absorption level of country for improving accuracy of statistics on greenhouse gas emissions.

○ Develop guidelines on development and assessment through operational management system on emission, absorption and verification, and improve figures on emission and absorption.

□ The introduction and expansion of greenhouse gas emissions reporting system

○ Designate and report on competent authorities, range of target to be

reported, and GHG emissions of international levels for introducing greenhouse gas reporting systems, and prepare detailed verification guidelines and operating regulations.

○ Expand the basic infrastructure such as designate specific validation and accreditation bodies, greenhouse gas management system and introduce full-scale greenhouse gas emissions reporting system.

○ Establish system on sector-specific statistics on greenhouse gas emissions beyond standard and guide development and management of business site-specific emission figures.

- Use basic infrastructure to introduce Emissions Trading Scheme.

○ Establish local government inventory system that gives reference to greenhouse gas emission by cities, districts and boroughs in the municipality.

○ Establish database from comprehensive management system linked to greenhouse gas such as national inventory system, inventory systems, local governments and other sources.

▣ **Performance Indicator**

○ Performance on development and approval of Country-specific emissions and absorption.

2-3 Expand sustainable carbon sinks

▣ Status Analysis

□ It has been recognized at the Kyoto Protocol that forests are carbon sinks that largely absorb greenhouse gases in the atmosphere.

○ In Korea approximately 7.5% of total greenhouse gas emissions which are 7.5 percent of 46 million tons (based on 2007) of CO_2 are absorbed through the forests.

○ In addition, fuel substitution effect occurs as there is possibility to use wood pellets and bio-energy.

□ In order to implement low carbon, resource circulation society, there is need to sustainably develop and manage forest.

○ With deforestation and conversion of forests in developing countries, carbon sink protection issues (REDD) has emerged internationally. Hence there is greater need to prepare measures on this issue.

□ Introduce ecological system designated for mountains for preservation of forests.

○ Introduce new standard where natural landscape and ecological environment can be preserve as much as possible while using the mountains.

- Use low-density while minimizing the trait changes and maintaining existence as possible.

○ Sustainable management of mountains even after being designated as "the ecological designated areas" of the producer-only section.

- Impose obligatory management of mountains to remain intact within the ecological designated areas.

- Sustainably manage ecological designated areas as mountains by establishing information system associated with intellectual and registration information (Enlarge information system on mountain).

○ Revise regulations on various facilities directing it to minimization of natural environment.

※ In Germany, there are conditions that the installation area of facilities should be reforested after a period of time.

□ Establish trading systems that can be linked to investment in private forest mountain.

○ Institutionalize the concept of "Origin Trading System" which allows credit to that applied to mountains corresponding to the investment in forestry and mountain development.

○ Add fostered results or investment in mountain forests as based on private certification of mountains.

- Currently, there is annual increase by 16,000 ha of producer area and it is inhibited in accordance to the market external effects in the mountains. Contrary to this, there is investment in forestry that faces activation of public market value.

▣ Direction of Promotion

□ Expand afforestation projects and strengthen the carbon uptake function through forest conservation.

□ Develop composition of bio-circular forest and promote sustainability of utilizing forest resource.

Indicator	Performance goal		Measurement method
	'10	'15	
Forest carbon stocks (million tCO_2)	1,494	1,695	According to IPCC guidelines, national forest survey of carbon dioxide absorption

2-3-① Expand forest carbon sinks

< Goal >

Expand the value of forest through sustainable forest management and expansion of carbon sinks.

■ Departments organized : Korea Forest Service

▣ Execution Plan

□ Expand carbon sinks through afforestation of idle lands etc.

○ Promote new afforestation projects concerning idle land, poor pasture and marginal land for expansion of carbon sinks.

○ Promote the expansion of new carbon sinks when planning new green space such as reclaiming land in Saemangeum, planning for large-scale land use and government complex.

※ New Zealand promoted the establishment of 'Afforestation Vision 2020' in order to expand business investment in new forest planting and expand introduction secondary measures.

○ Promote five-year plan (2009-2013) on the two-phase afforestation for expansion of carbon sinks.

□ Develop and disseminate for renewing carbon absorption capacity of the degraded forest carbon sinks.

○ Promote stepwise updating of species where the carbon sinks degraded due to limited Rigida growth in pine forest.

○ Select and develop the species with high capacity in carbon absorption through evaluation.

▣ Performance Indicator

○ Forest carbon stocks (million tCO_2)

2-3-② Develop bio-circular forest

< Goal >

Expand carbon sinks through forests composed with bio-cycle and establish feedstock based on biomass materials.

■ Departments organized : Korea Forest Service

▣ Execution Plan

□ Expand carbon sinks through bio-circular forests with fast and high productivity growth and respond to increased demand on biomass.

○ Grow high-value species with fast growth like lily trees.

○ Compose and use bio-circular forest areas that demand high biomass like paper, and pellets as target.

- By 2020, composition of bio-cycle forest 100,000 ha.

※ (Bio-circular forest) harvest timber of 15 to 25 years (optimal timber production ages) by planting those species with fast growth pace and high carbon-absorption compared to the original (40 Years Old) growth. The forests by using the raw material of such bio-energy.

□ Promote international development of forest resources as drawn out in the "International Forestry Resources Development Master Plan"

○ During the period of the basic plan (2008 ~ 2017), promote 25ha of the foreign plantation and promote 1,000,000 ha by 2050.

- Industrial forest plantation of 150,000 ha, planting carbon 50,000 ha and 50,000 ha of bio-energy plantation

○ Promote biomass afforestation of 200,000 ha as concluded in the MOU with Indonesia "One, forest biomass industry development."

- Carry out cooperative project on model development of forest biomass in Indonesia for the development of renewable energy (pellet processing and afforestation).

○ Carry out afforestation for laying the foundation for overseas plantation in Central and Latin America.

- Secure carbon credits through afforestation project (Uruguay 10,000 ha) and South America pilot afforestation (Paraguay 20,000 ha).

▣ **Performance Indicator**

○ Composition of bio-circular forest (10 thousand ha)

○ Development earnings of forest resources overseas (thousand ha)

2-3-③ Expand carbon storage capacity in agricultural sector

< Goal >

Enhance carbon storage capacity of farmland and establish low-carbon agricultural system through utilization of agricultural biomass.

■ Departments organized : Rural Development Administration

■ Cooperating Authorities : Ministry for Food, Agriculture, Forestry and Fisheries

▣ Execution Plan

□ Enlarge carbon storage of farmland and agricultural crops biomass.

○ Expand carbon storage through cultivating woody crops by using fallow ground and abandoned land.

○ Expand improved agricultural carbon storage capacity through agricultural soil management such as minimizing tillage area, plant residue, bio-fuel, soil erosion control, reclamation of salt farming, drainage and etc.

□ Develop and disseminate bio-gas system for deriving resource from livestock manure.

○ Develop bio-gas production system (SCB-M) in connection with the only filtered compost manure (SCB) facility.

○ Reproduce electricity and fertilizers from animal manure by distributing in livestock and public recycling facilities.

▣ Performance Indicator

○ Stocks increase of carbon in soil (%)

2-4 Establish an early response system to climate change

▣ Status Analysis

□ Despite the frequent occurrence of floods and droughts caused by climate change, there is lack of system to manage and predict the meterological phenomena.

□ Establish a system for sharing information on sectoral impact based on the climate change scenarios, high resolution forecasting and monitoring information.

○ IT technologies are currently available hence it is possible to pass on relevant information.

□ There is need to develop a skill that can lead for monitoring and measuring greenhouse gas emissions.

○ Measurements on greenhouse gas carbon dioxide, methane, and nitrous oxide are US-led.

▣ Direction of Promotion

□ Predict meteorological phenomena through expanding climate change radar and climate change scenario development, and establish response prediction system for prior forecast.

□ Promote development on measurement technologies and monitor South Korea greenhouse gas.

Indicator	Performance goal		Measurement method
	'10	'15	
Development of integrated Earth system model, the rate (%)	40	90	Integrated development models of climate change performance prediction / objectives) x100

2-4-① Raise the Surveillance System on Climate change

< Goal >

Bring about scientific movement in measuring greenhouse gas through establishment of global standard center and watchhouse for supervision.

■ Departments organized : Meteorological Agency, Ministry of Environment

▣ Execution Plan

□ Launch new supervising facilities on climate change and centers on global standard greenhouse gas measurement.

○ Expand climate change monitoring network through establishing watchhouse on climate change in Ulleungdo / Dokdo.

- Currently a watchhouse on climate change is under operation in Anmyeondo, Jeju Island and by expanding this, strengthen the monitoring capacity.

○ Propel for attracting establishment of standards for greenhouse gas monitoring and development of global standard center on measuring greenhouse gas emissions.

□ Establish and operate a comprehensive super-site that monitors both greenhouse gases and air pollution.

- Four super sites that includes Baengnyeongdo, Seoul Metropolitan area, Central & Southern regions.

▣ Performance Indicator

○ Rate on advancement of climate change predictions and monitoring capabilities (%)

2-4-② Produce climate change scenarios and develop predictive models of climate change

< Goal >

Strengthen adaptation capacity through establishing web-base and national climate change scenarios.

■ Departments organized : Meteorological Agency

▣ **Execution Plan**

□ Provide customized information for supporting development and provision of national standards on climate change scenario and support on adaptation sectors.

○ Produce and provide high-resolution climate change scenarios from global models that reflects the regional climate characteristics according to international standards on greenhouse gas scenarios.

□ Develop and validate global climate change scenarios on AR5 (IPCC 5th report).

○ Link the project production of global climate change scenarios "Coupled Model Inter-comparison Project phase 5 (CMIP5)" according to the new international standard "scenario, greenhouse gas concentrations (RCP)."

○ Analyze and verify experiments on global climate change scenarios based on RCP.

□ East Asia: Korea: regional-scale production and verification of climate change scenarios

○ Produce East Asian regional climate change scenarios in association with the "CORDEX (Coordinated Regional climate Downscaling Experiment)" projects.

○ Produce and experiment the national standard climate change scenarios.

○ Analyze and verify regional and national standard climate change scenarios.

□ Production of consumer tailored climate change scenarios

○ Develop sectoral (agriculture, forestry, ecology, health, energy, etc.) customized scenarios.

○ Develop regional (city, mountain, coastal, plains, etc.) customized scenarios.

□ Calculate climate change scenarios experiments using development of readers earth system model.

○ Develop the earth system model through combining modules on carbon cycle, dynamic vegetation, and ecological dynamics.

○ Draw up information on aerosols, marine acid activation and hydrology calculated sing the earth system model.

○ Compose basis for global climate change scenarios production and pilot production based on Assessment Report IPCC 6 (AR6).

□ Establish and operate web-based information service system for adapting to climate change.

○ Establish and operate a system for providing consumer-driven data on climate change.

- Support utilization of information, improving support for impact and vulnerability assessment in accordance with massive increase in demand for forecasts of climate change.

※ Countries such as UK and methodologically advanced countries conduct a web-based one-stop information service.

□ Development of carbon-tracking system

○ Develop Asia-based system on tracking global carbon.

▣ **Performance Indicator**

○ Results of climate change scenario development

○ Development rate on integrated earth system model (%)

2-5 Establish National Food Security System

▣ Status Analysis

□ With climate change, there is insecurity in supply and demand on cereal and grain around the world with outlook on its rise.

○ Changes in the rate of global cereal stock: 32.0% (2000 / 2001) → 18.7% (2006 / 2007) → 20.7% (2008 / 2009)

○ Rise in cereal price internationally (2008 compared to '00. August): 787% of rice, wheat, 307%, 232% corn, beans, 557%

□ Japan has developed its own model of food production in order to predict its changes caused by climate change scenarios. However there is lack of technology at the domestic level.

□ With frequent and extreme weather conditions, there is need to develop disaster tolerance varieties.

○ The development on varieties of food crops takes at least 10 to 15 years. However development on varieties of disaster tolerance is still at an early stage.

□ There is need to introduce and change to new crops adapted to climate change and development on cultivation technology.

<Status of global warming and its prospects in Korea and around the world>

Sector	Past 100 years	compared to 2000's			Sources
		2020's	2050's	2100's	
Peninsula (A1B) (base:1971~2000)	1.7℃ (1912~2008)	1℃ (2016~2020)	2℃ (2046~2050)	4℃ (2096~2100)	the Meteorological Agency
World (A1B) (base:1980~1999)	0.7℃ (1906~2005)	0.7℃ (2011~2030)	1.8℃ (2046~2065)	2.7℃ (2080~2099)	IPCC Report

▣ Direction of Promotion

□ Develop varieties resistant to climate change and through establishing information system on food production secure system on food security.

□ Expand production base of marine resources and secure good land for stable food supply.

Indicator	Performance goal		Measurement method
	'10	'15	
Food self-sufficiency (%)	54.7	57	(National production rate of food crops/National consumption rate) x 100
New income distribution-type small subtropical number	3	15	New income distribution-type small subtropical number

2-5-① Impact Assessment and Prediction on Food Production from Climate Change

< Goal >

Establish a stable food production systems by utilizing food production assessment and productivity forecasting system.

■ Departments organized : Rural Development Administration

■ Cooperating Authorities : Meteorological Agency

▣ Execution Plan

□ Assess the impact on crop production and quality

○ Rate the quantity of rice according to the rise in temperatures and CO_2 concentrations.

- Analyze the physiological responses and yield ability according to adjustment on artificial temperature and CO_2 concentration.

○ Impact on growth and quality assessment of horticultural crops from rising temperatures.

- Quality assessment that affects quality and growth of crops due to temperature.

- Analyze link between weather conditions according to plantation movements and fruit growth, and quality factors.

○ Plan measures to maintain quality and production of crops adapted to climate change.

□ Develop forecasting model on crop production

○ Develop predictive models on crop production from climate change.

- Develop predictive models on production of 10 crops such as rice, beans, barleys and fruit trees.

- Utilize the Decision Support System for Agrotechnology Transfer (DSSAT) optimized domestic conditions.
- Validate and advance the predictive models that apply empirical data on sectoral reaction to temperature condition and carbon dioxide.

○ Support establishment of national strategies on stable food supply.

- Prepare measures on planning agricultural land use, right crop for right land programme and expansion of food production.

□ Develop indicators and system on impact assessment of agricultural resources production and agricultural productivity.

○ Develop indicators for assessing agricultural resources production and productivity change.

- Develop evaluation index on productivity change of major crops (rice, beans, pulsating, fruit, etc.).
- Develop evaluation index on impact assessment and establishing database for setting index changes on agricultural resource production (agricultural land area available, the soil, the amount of agricultural water resources, etc.).

○ Develop comprehensive evaluation system on long-term agricultural resources production and changes in productivity.

○ Support analysis on agricultural productivity and production resources utilizing a standardized rating system for local governments.

- Support to establish long-term strategy on maintaining food production base for State and local governments.

□ Develop forecasting system on major crops pest and disease due to climate change.

○ Develop forecasting system of major crop pests and diseases and high-resolution system on weather information for agriculture.

- Develop model on analysing and forecasting major crop pests and diseases and analysing high-resolution meteorological data on agriculture.

▣ **Performance Indicator**

○ Development rate of indicators and system on agricultural productivity and impact assessment (%)

2-5-② Raise climate-friendly basis of food production

< Goal >

Develop and disseminate crop cultivation adaptation technologies to climate change and establish a stable food production basis through eco-friendly agricultural production.

■ Departments organized : Ministry for Food, Agriculture, Forestry and Fisheries, Rural Development Administration

▣ Execution Plan

□ Develop species and breeds that can well adapt to climate change and disaster, after which expand technology penetration on subsequent cultivation, raising and breeding.

○ Develop species and breeds that can well adapt to high temperature and disaster, and cultivate and provide production technology for regional climate adaptation and production of specialized crops.

○ Develop alternate form of high value-added fish and fishery resources, as well as excellent high-temperature resistant varieties.

□ Develop and disseminate high-tech future innovation and technology.

○ Such as agricultural robots, IT and BT convergence technology and the automation system.

□ In order to ensure domestic food production, secure collectivized and scaled quality land and expand basis for production of fisheries resources.

○ Preserve large-scale reclaimed land such as Saemangeum as a farmland, expand measures on manure used from fallow land during winter, and establish a comprehensive system on export-oriented agricultural food.

○ Expand fisheries resources through ensuring eco-friendly marine ranch and discharge nursery for harmonizing ecosystem and diverse coastal species.

▣ Performance Indicator

○ Results on varieties and fish types adapted to climate change and disaster.

2-5-③ Establish information system on major grain consumption and production

< Goal >

Establish crop information system. through preparing food security systems basis.

■ Departments organized : Rural Development Administration

■ Cooperating Authorities : Meteorological Agency

▣ Execution Plan

□ Monitor cultivated area and harvest fluctuation of primary production of major grain and consumer, and predict the final harvest based on evidence of prospects of crop models and advanced techniques such as remote sensing and agricultural weather forecast.

○ Establish information-system networking between crop harvest information system of advanced techniques such as on crop models and remote sensing.

○ Monitor the export and entry of main grain and use it to understand and predict the international situation changes on food supply and demand.

○ Develop statistics techniques based on meteorological models, crop models, crop forecasting data.

▣ Performance Indicator

○ Number of internationally established crop monitoring system

2-5-④ Expand International Cooperation on Resilient Food Supply

< Goal >

Strengthen agricultural development through agricultural sector support of developing countries and ensure a steady international supply network through overseas agricultural development.

■ Departments organized : Rural Development Administration,

■ Cooperating Authorities : Meteorological Agency, Ministry for Food, Agriculture, Forestry and Fisheries

▣ Execution Plan

□ Strengthen agricultural cooperation through supporting developing countries in agricultural technology, meteorology, and rural development.

○ Conduct training on consulting for developing agriculture, rural development, agricultural technology of developing countries.

○ Host the Asia training center (RMTC) on agricultural weather Information and Communication Technology (ICT).

○ Establish "Foreign Agricultural Technology Development Center," and train and dispatch experts through installation of agricultural technology projects.

□ Promote overseas agricultural development for attracting stable international supply chain of food and feed crops.

○ Promote it in a private sector-driven and which is led by end-users, and government to support diplomatic, technical and financial aspects of information.

▣ Performance Indicator

○ Performance on training developing countries' labour force in new agricultural technology

○ Cooperation result on international agricultural cooperation

2-6 Enhance identification of new projects on adaptation to climate change

▣ Status Analysis

□ With the burden of greenhouse gas emissions reduction, climate change is playing a role as an area to be pioneered for a new business to be worked together.

○ Through the development of new products and adaptable new technologies, new industries and jobs are made available.

○ It is possible to venture into countries with similar climatic conditions as the Republic of Korea.

□ There is need to establish development and training measures on the promising business sectors concerning the adaptation to climate change.

○ Create new business on technologies for adaptation to climate change and nurture market dominance and competitiveness.

○ There is need to indicate national guideline for inducing interest of private sector and identify new projects.

▣ Direction of Promotion

□ Bring up profession workforce, identify and nurture new projects on adaptation to climate change.

□ Provide incentives on market formation concerning adaptation to climate change and support projects.

Indicator	Performance goal		Measurement method
	'10	'15	
Weather and Climate Industry Development (100 million won)	540	2,315	Weather and climate on an industrial scale (100 million won)

2-6-① Support policy development for identification and development of new business

< Goal >

Increase support for projects which has emerged with importance due to climate change, such as on climate forecasting, weather disasters, weather insurance, water resources and energy projects.

■ Departments organized : Ministry of Knowledge Economy

■ Cooperating Authorities : Ministry of Environment, Ministry of Strategy and Finance, Meteorological Agency

▣ Execution Plan

□ Identify and support new and promising industry in the sector of adaptation to climate change.

○ Identify and support industry in disaster prediction, weather insurance related to climate change.

○ Identify and support green financial industry such as bonds associated with climate change, weather disasters insurance.

- Induce industrial sector so that weather derivate can be activated nation wide.

○ Identify and support projects and technology in securing diverse water resources.

- Expand projects on providing water through control in rainwater storage technology.

○ Review stable energy supply project through energy efficiency and storage technology.

- Enable energy efficiency through innovative technology on power measurement, and stable energy supply technology that utilizes automobile energy storage device.

○ Identify and foster specialized promotional marketing industry.

- Identify and foster promotional marketing industry as a environmentally specialized and promising in both domestic and external environment.

○ Promoting eco-tourism as an industry adapting to climate change.

□ Nurture professional workforce that reflects demand of the industrial world in adapting to climate change.

○ Promote nurturing professional workforce for adaptation policies and new project development by associating with graduate schools that specialize in climate change.

- Promote nurturing of the experts that are tailored to analysis and forecast of the new industries and the future promising industries (carbon industry, insurance industry, promotional marketing industry and energy storage industries).

▣ **Performance Indicator**

○ Sales increase rate of new business on adaptation to climate change.

2-6-② Foster Industries on Climate Change and Develop Weather Support Map

< Goal >

Foster climate information industry that will support development of renewable energy projects.

■ Departments organized : Meteorological Agency

▣ Execution Plan

□ Foster climate information industry for expanding renewable energy development and develop its technology.

○ Foster weather resource map and climate information industry for developing future development of alternative energy, develop effective wind and solar energy resources, and improve efficiency in operation.

○ Identify weather information that can be directly used in developing industrial position and renewable energy, and promote cooperative technology system that gives medium and long-term links with industries.

○ Develop meteorological technology that supports smart grid.

- Develop point weather forecast system for wind and solar power plant development.

▣ Performance Indicator

○ Utilization rate of weather map resources (%)

○ Growth in weather and climate industry (hundred million won)

3 Promote Social Equity and Public Health

3-1 Promote economic activities in disadvantaged communities

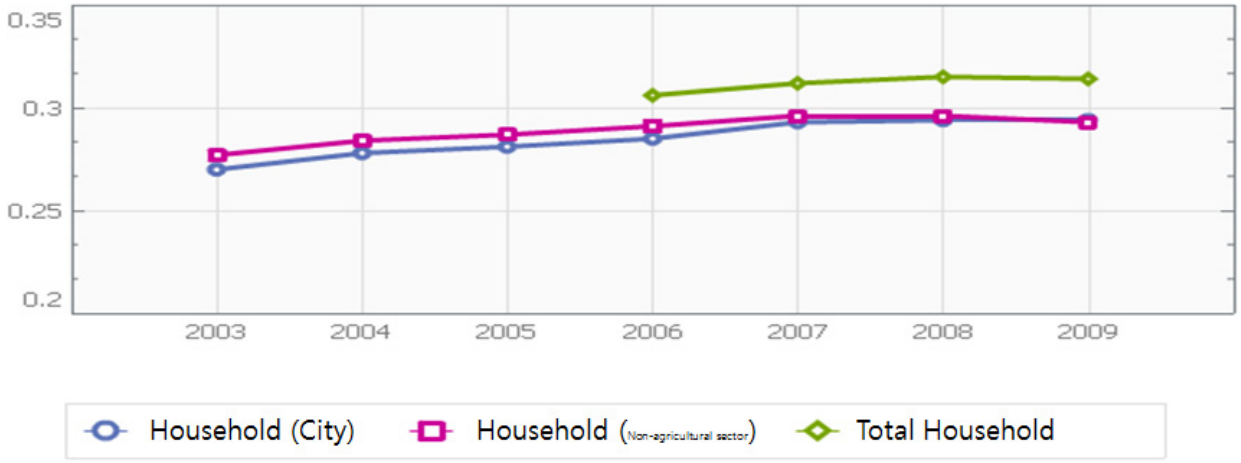
▣ Status Analysis

☐ World Summit on Sustainable Development (WSSD) proposes for a "slum-free city" by 2020.

☐ The polarization of industry, labor structure and income acts as an element leading to social conflicts.

☐ There exist working poor of the elderly poor and next higher level who cannot receive national protection despite the fact that they live below the minimum cost of living.

〈Changes in the Gini coefficient of Korea〉



☐ In spite of economic recovery, the living conditions of the low-income group are still difficult.

☐ The decline of population and with falling birth rates has intensified.

※ In order to solve the challenges of low fertility rate and aging society, the "Basic law on low birth rate. Aging society," enacted (2005.9), and its basic plan has been established and is being implemented.

▣ Direction of Promotion

□ Create an environment for economic independence of the disadvantaged groups through employment and financial support.

Indicator	Performance goal		Measurement method
	'10	'15	
Number of employment for the vulnerable groups (ten thousand)	8.23	10	Employment worknet calculated
Percent of population living below the poverty line (%)	14.9	13	(Median income less than 50% of the population / total population) × 100
Percentage of aged population (%)	11.0	15.1	(65 years old and over population / total population) × 100

3-1-① Strengthen Financial Support for the Disadvantaged Communities

< Goal >

Expand economic support of low-income families and communities to protect their livelihoods.

■ Departments organized : Ministry of Health and Welfare

■ Cooperating Authorities : Ministry of Knowledge Economy, Ministry of Strategy and Finance

▣ Execution Plan

□ Strengthen the protection of basic livelihood for those receiving supplementary basic allowance.

○ Gradually raise the minimum cost of living and realize housing and education benefits.

○ Develop and implement payroll account program on supplemental allowance, after which expand the welfare benefits (based on age, disability pension, etc.).

□ Expand support programmes for children of low-income families.

○ Increase the scope of services and installation area of "dream start," which is a welfare service for children of low-income families.

○ Expand the "didim seeds account" that supports saving that matches both personal and government's costs needed when children of low-income families enter into the society.

○ Provide a pleasant and safe environment for children users of the regional children's centre by strengthening standards of its facilities and workers.

□ Substantialize the Basic Old Age Pension System

○ When calculating income, expand the earned income based on the deduction and provide the Basic Old Age Pension concerning probationer of the old aged.

▣ **Performance Indicator**

○ Installation number of the dream-start

3-1-② Expand the employment of the disadvantaged communities

< Goal >

Improve the ability of the disadvantaged communities to be employed and prevent discrimination through strengthening job accessibility and skills development.

■ Departments organized : Ministry of Employment and Labor

■ Cooperating Authorities : Ministry of Gender Equality and Family, Ministry of Health and Welfare

▣ Execution Plan

□ Enhance accessibility of employment by the vulnerable group

○ Support the non-regular workers, small-scale self-employed and the working poor.

- (Non-regular workers) Provide support through specialized training programs for them to move upward to better jobs.
- (Small self-employed) strengthen competitiveness through customizing paid work and management consulting.

○ Promote women cut off from career to reenter into the labor market.

- Expand programmes for women with childbirth and parenting to re-enter the labor market and increase their employment rate.

○ Expand employment opportunities for disabled and promote customized training services.

□ Support skills development for vulnerable groups

○ Strengthen the support of "Tomorrow's Learning cards" for vulnerable groups.

- Reduce the own payment depending on the participants of the Employment Success Package and expand account limit.

○ Expand the acceptable range for training the vulnerable groups.

▣ **Performance Indicator**

○ Number of employment for the vulnerable groups (ten thousand)

○ Rate of female labor force participation (%)

3-1-③ Enhance manpower utilization of the aged to prevent aging society

< Goal >

Ensure a stable and vibrant aged life through expanding participation of labour market and job opportunities.

■ Departments organized : Ministry of Employment and Labor, Ministry of Health and Welfare

▣ Execution Plan

□ Strengthen support for renewal and re-employment the middle and advanced-aged.

○ Extension of employment in main job

- Support the extension of employment of the middle and advanced-aged group through spreading wage peak system, instructing voluntary labor to extend retirement age map, gradual retirement through reduced working hours.

※ Extend retirement funding (4,908 person in 2010 → 10,000 person in 2015), retirement funds rehired retirees (3,803 person in 2010 → 7,000 person in 2015), the wage peak system funding (1,869 person in 2010→ 5,000 person in 2015)

○ Assist employment and expand social contributing employment of middle and advanced-aged group.

- Provide specific re-employment services according to the needs and characteristics of the middle and advanced-aged group such as those having difficulties getting employed, retired professionals and the unemployed.

- Expand social contributing employments where retired professionals can participate in the community with their expertise and experience.

□ Phased expansion of employment for the elderly

○ Public Sector jobs (in 2010) 166 thousand ⇒ (in 2015) 276 thousand

○ Private-sector jobs (in 2010) 20 thousand ⇒ (in 2015) 24 thousand

□ Advance the quality of employment of the elderly

○ (Public Sector) Improve social values, diversify labour forms and differentiate salary.

- Reduce the simple labour jobs such as improving the street environment etc. and identify and operate high social-value jobs.

- Operate the working hours flexibly according to the work intensity and type of work, and promote pilot projects that give differential salary.

○ (Private sector) determine whether to continue supporting by conducting project's result diagnostics and lay foundation for development of sustainable jobs.

- Through result diagnostics by projects, expand and reorganize the jobs with higher suitability, profitability and sustainability. In addition, develop and spread various creation of new jobs and internship programmes.

- Support the establishment of a professional industry that is elderly-friendly and where link between majority work category and promising career category, and the characteristics of the elderly can be well utilized.

□ Restructure the support system on job employment and strengthen its role.

○ Strengthen the policy support function of Korea Institute of Elderly Human Resource Development.

- Strengthen the research capacity and quality in private sector jobs, restructure through diagnosing organizations and further strengthen the function of policy support through staff relocation.

- Seek measures to strengthen participating services for the elderly such as customized consulting services, education, jobs, volunteer work etc.

○ stablish an organ exclusively for employment of the elderly and expand its support.

- Expansion of newly designated regional social senior clubs (in 2011) 100 places → (in 2015) 140 places
- Improve the performance management approach on the committee for employment support for the elderly and enhance the function of private employment.

▣ **Performance Indicator**

○ Rate of elderly employment (%)

○ Number of jobs seniors participate in

3-2 Improve the Living Conditions of the Vulnerable Communities

▣ Status Analysis

□ Compared to the OECD countries, Korea's welfare level is still low. However there is ever-increasing demand on welfare for the elderly.

○ The demand for new policies is rapidly increasing for the disabled, elderly, poor infants, as well as other traditional vulnerable groups and the elderly living alone.

- Incase of the elderly living alone, there was an increase from 550 thousand households in 2000 to 1,020 thousand households in the year 2010.

□ In spite of the economic recovery, there is still difficulty due to low-income living conditions.

○ There is low quality of life among the vulnerable groups such as the children, elderly and the impaired.

- Relative poverty rate: In 2007, 14.8% → In 2009, 15.2%

○ Due medical expenses, there is relatively high proportion of household poverty (18%). Therefore medical expenses act as a major source of ill poverty and obstacle to growth.

▣ Direction of Promotion

□ Improve the quality of life of the vulnerable group in society through support in housing and health care services.

Indicator	Performance goal		Measurement method
	'10	'15	
Number of performing nest housing (thousand)	16	20	Housing construction number of home during the year

3-2-① Strengthen Health Services Support System for Vulnerable Groups

< Goal >

Improve the medical accessibility and health care through expanding support for medical service for the low-income and elderly.

■ Departments organized : Ministry of Health and Welfare

▣ Execution Plan

□ Expand health services for the elderly

○ Promote 'a pilot project of linking long-term care and medical institutions' that provides exclusive service to those admitted through agreements between the long-term care institutions and medical institutions.

○ Conduct early screening on Alzheimer's disease to those in high risk such as 60 years old and/or older and therefore enhance the quality of life of the elderly patients and their families by early detection and managing Alzheimer's disease.

□ Expand projects on medical benefits for the low-income

○ Strengthen guarantee on high-cost disease that are severe and promote expansion of medical benefits coverage (promote in conjunction with enhanced health insurance plan).

○ Promote expansion of criteria relief on those eligible to medical benefits.

○ Promote case management for efficient medical benefits.

▣Performance Indicator

○ Number of government supported health care services

3-2-② Enhance the Housing Support for the Vulnerable Communities

< Goal >

Compose stable basis on housing for vulnerable community.

■ Departments organized : Ministry of Land, Transport and Maritime Affairs

■ Cooperating Authorities : Ministry of Health and Welfare, Ministry of Strategy and Finance

▣ Execution Plan

□ Expand the supply of housing

○ Settle the insecure housing problem of the low-income through providing homes and promote people's homes.

○ Integrate the various types of rental housing and small and medium-sized housing, after which supply them.

○ Provide housing of public rental multi-family and lease to support housing of the low-income in towns.

□ Expand the supply of customized rental housing

○ Provide rental housing where necessary by establishing demand supply system.

○ Improve the rent scheme and tenant eligibility in order to supply housing to the consumer's ability to pay.

○ Gather consumer opinions by involving the regional community and tenant representative bodies in the operational management.

○ Increase the volume of rental housing through long-term rental housing of 10 years secure practical features for lease.

○ Enhance participation of rental housing projects of investors in financial institutions where long-term funding is available at the same time strengthening the role of public sector.

- Establish a response system concerning increased risk in bankruptcy and reducing profitability from prolonged lease.

▣ **Performance Indicator**

○ Results in house distribution (thousands house)

3-2-③ Promote Youth Health Care

< Goal >

Expand social infrastructure for the formation of healthy youth culture.

■ Departments organized : Ministry of Health and Welfare, Ministry of Gender Equality and Family

■ Cooperating Authorities : Ministry of Education, Science and Technology, Ministry of Culture, Sports and Tourism

▣ Execution Plan

□ Expand youth activities infrastructure

○ Establish and operate 'Youth Support Center' by municipalities, districts and borough or by areas to provide integrated support and welfare services.

○ Develop evaluation indicators for community interest and awareness boost concerning the Integrated Youth Support System of youths in the region.

○ Annually increase the comprehensive self-support programs (Do Dream Zone).

- Scholarship goal: (2011), 10,000 person → (2015), 50,000 person

○ Enable Children and Youth club activities and volunteer activities.

- Expand civil society networks for civil and administrative volunteer work and focused enhancement of the excellent youth clubs.

□ Expand work experience activities and career counseling programs

○ Manage job-specific programs for hands-on experience that fits the targets through vocational School (Job School) to provide teaching, professional and participating experience as linked to the regional universities and industries.

○ Enhance counseling service mainly through the department of education and the youth (Counseling) Support Center.

○ Strengthen counseling service and counselling education in schools through expanding counselors.

- Expand career counseling available through the internet which is comprehensive national career information web site (career.go.kr).

□ Draw up healthy eating environment for youths

○ Improve on the environmental factors that cause underweight and obesity in adolescents.

- Promote projects on diagnosis, treatment and therapy of underweight and obese adolescents through cooperating schools, facilities and organizations.

○ Designate 200m around the school area as the Food Safety Protection Area in order to monitor children's favorite food and health regulations especially the unhealthy children.

□ Strengthen the prevention and treatment of youths' internet addiction.

○ Improve legal framework for the prevention of youth Internet addiction.

- Restrict adolescents' doing internet games at late-night time (0:00 to 06:00) through restricted time given (shut down system).

○ Strengthen support for therapy and counseling on internet addiction prevention.

- Promote development of intensive care and rehabilitation programme according to the levels of risk.

□ Continuously promote programmes on preventing smoking and hazardous drinking behavior.

○ Expand and institutionalize alcohol-drinking restricted areas in public areas such as parks, stadiums, amusement facilities and multi-use facilities.

○ Designate and expand public no-smoking zones that includes around areas of youth facilities.

○ Support prevention and treatment of youths' drinking and smoking.

- Provide youth counselling on smoking and preventive training on taking hazardous drugs especially targeting adolescents who have discontinued studies.

□ Continue to suicide prevention programs

○ Promote diversified programmes in awareness bringing, counselling and education on prevention of suicidal accidents.

- Operate various programmes in establishing culture where people have respect for life such as suicide prevention hotline and internet consulting services as well as suicide prevention training for staff.

○ Design system on emergency relief for youths with suicidal risk, crisis intervention and its post-management.

▣ **Performance Indicator**

○ Satisfaction rate of adolescents about life

○ Euphoria rate of youth

3-3 Building a Community-based Rural Development

▣ Status Analysis

☐ Within the industries, there is need to expand the growth gap between the agricultural sector and other industries.

☐ Farming and fisheries communities is underestimated in terms of living place, work place and shelter when compared with agricultural regions of cities and developed countries.

〈Comparison of key indicators of farming and fisheries communities〉

Rural	Comparison	With City		With Those of Advanced Countries	
Living conditions	Housing	Rate of house aged less than 20 years	80% of that of the city	Housing quality	Lower than advanced countries
	Medical service	Number of doctors per 1,000 residents	71%	Number of doctors per 1,000 residents	Lower
Working conditions	Industrial infrastructure	Employment opportunity (Number of jobs/ Number of economically active population)	115%	Ratio of employment in 2nd and 3rd industry	Lower
	Income level	Resident tax based on income of 1 person	64%	Income level	Lower
Relaxation	Green field	Green field rate	129%	Green field	Lower
Community	Population composition	Ratio of economically active population	82%	Ratio of economically active population	Similar
	Education level	Ratio of population educated in university or above	46%	Ratio of population educated in university or above	Lower

☐ There is need to expand the income of farmers and rural welfare in general, and great need to develop programmes for rural development.

○ Due to foot-and-mouth disease and extreme weather change, there is unstable income among farmers.

○ Need for continuous improvement for rural residential environment.

▣ Direction of Promotion

□ Ensure improved living conditions and stable income in rural areas by promoting sustainable development of rural areas.

□ Strengthen capacity for development and conservation of village residents through education.

Indicator	Performance goal		Measurement method
	'10	'15	
Areas residents satisfaction (%)	82.2	88	Residents survey results to target business
Key leader training (person)	735	1,000	Students produce a key leader training graduates

3-3-① Stabilize management and income of farmers

< Goal >

Expanding farmers' compensation system and improve rural incomes through promoting industrial advancement

■ Departments organized : Ministry for Food, Agriculture, Forestry and Fisheries, Rural Development Administration

▣ Execution Plan

□ Promote stabilized livelihood of farmers through increase subscription rate to casualty deduction.

○ Expand farmers' net benefit through expanding coverage and compensation level of casualty deduction.

□ Improve conditions of inshore fishing industries and promote safe livelihood of operations through support in disaster compensation insurance of fishing vessels and fishermen.

○ Promote on-site marketing for expanding insurance for fishing vessels and its crews.

○ Promote expansion to join through convenience-oriented system of fisheries improvement.

□ Promote introduction of "Stable farm income debit" that preserves secondary part of falling farm income that follows increased prices of agricultural products and production costs, etc.

○ Full scale promotion after 2013, as going through the second bed practice of 2011.

□ Establish risk management system on regenerative farm business by strengthening proactive disaster prevention and support for regeneration.

○ Promote stable management of crops through expanding target items of casualty insurance against natural disasters.

※ Expanded to 40 items by 2013

○ Establish organization on self-help fund focused on the producers of the main items and system on voluntary pension adjustment to prepare for price downfall.

□ Excavate various income raising industries for enabling rural tourism, local industrial development, agroindustrial complex expansion, etc as second and third industries to be established.

○ Promote systematic and strategic investment by local governments for industrializing local resources.

○ Expand investment in R&D by local level to promote industrialization and establish support system.

○ Expand rural tourism experience, rural exchanges and local festivals, globalizing Korean foods, etc. and strengthening place marketing.

▣ **Performance Indicator**

○ Farmers secure credit subscription rate (%)

○ Agricultural support enterprise revenue growth (%)

3-3-② Expand Basis on Rural Health and Medicine

< Goal >

Improve health service for rural residents through the expansion of public health facilities.

■ Departments organized : Ministry of Health and Welfare

■ Cooperating Authorities : Local governments

▣ Execution Plan

□ Expand infrastructure and support emergency medical facilities and equipment in vulnerable rural areas.

○ Support for emergency patient transport scheme such as use of helicopter and ship building and set up 119 emergency support center.

□ Strengthen and expand health care service accessibility through enhancing health institutions in rural areas.

○ Promote Regional Medical Center, Red Cross Hospital as regional base hospital in the region for public health services.

○ Identify and designate areas that have significant medical services and provide support base for medical training.

□ Strengthen health care system that reaches those areas with inaccessible health care services.

○ Provide health care services of professionals directly visiting households with basic living beneficiary.

○ Provide health care through visiting expectant women by local governments in rural areas such as prenatal screening and support through hospital ship for island residents.

▣ Performance Indicator

○ Enforcement rate of adequate on-site first aid during emergency (%)

3-3-③ Expansion of basic rural infrastructure

< Goal >

Improve the living conditions of rural residents through expansion of basic infrastructure.

■ Departments organized : Ministry for Food, Agriculture, Forestry and Fisheries, Ministry of Environment

■ Cooperating Authorities : Ministry of Land, Transport and Maritime Affairs, local government

▣ Execution Plan

□ Improve living environment in rural areas through improving worn out housing and slate reduction projects.

○ Promote maintenance of vacant housings in rural areas to improve village structure and planning.

○ Promote slate reduction projects for improving rural living environment.

□ Expand supply of water, rural roads and improved public transport system and basic living conditions.

○ Develop and support establishment of tubular well through the bedrock and its facilities in areas that lack water for agriculture and living (water purification, water pipe and drainage, water tanks, etc.).

○ Provide rural roads for comfortable communication for rural residents and access to local economy.

○ Improve dangerous segments of roads such as deep road bends, steep slopes, narrow road segments, etc.

○ Support for cost of buses routes wallpapers, transportation cycle support, or provide means of transportation in demand and take various measures suitable to the local characteristics.

▣ **Performance Indicator**

○ Rate of substandard rural housing renovation (%)

3-3-④ Prepare basis of rural area development

< Goal >

Establish regional basis for development in agricultural and fishing regions through fostering key leaders on community development and improving regional hub.

■ Departments organized : Ministry for Food, Agriculture, Forestry and Fisheries

■ Cooperating Authorities : Korea Forest Service

▣ Execution Plan

□ Invigorate the basis of location into active base for service centers and diverse economic activities.

○ Invigorate traditional markets and community center with diverse facilities for child care, exercise, leisure, and comprehensive development into life base for life comfort services.

□ Reassess service delivery system through town and village integrated approach that pursues development of small and medium-sized cities and surrounding rural areas.

○ Improve the accessibility between town centers and the nearby smaller towns and diversify service delivery methods.

□ Expand basis for recreation and experiencing specialized according to farm-town-centers.

○ Continually expand and operate various base for leisure and experiencing rural recreation through theme parks, fishing tourism complex, including forest recreational experience.

○ Expand, compose and integrate forest culture experience paths by linking various local space for cultural and ecological resources, as well as history.

○ Compose various forms of rural recreation of experiencing villages by utilizing rural landscape, cultural history, ecological resources and agricultural resources.

□ Enable support for rural exchanges

○ Promote network 'town and rural exchanges antenna shops' as basis for exchange between metropolitan locations and villages.

○ Identify and expand urban agricultural model for practicing green growth.

○ Promote conservation activities on environment, culture and landscape of rural areas in connection with urban, rural residents and community groups.

○ Strengthen publicity of the general public promoting rural and urban exchanges.

□ Expand training for human resource on developing rural areas.

○ Carry out customized training on capacity building on various subjects concerning community development for leaders in rural areas, residents, local government officials.

○ Operate education programme for nurturing instructors on village experience and analysis.

□ Disseminate forest management technology and develop expertise

○ Advocate for forest owners through special management measures such as by providing information on forest policies and technology of about owners of forest at least 10 ha.

- Promote diversification of map system and methods such as map on forest management system, restructuring of organization, and cyber technology map, etc.

○ Enforce intensive support concerning production, distribution and processing of forest products for international competitiveness in provision against WTO / DDA, FTA, etc.

- Establish information basis for direct and e-transaction on forest products by inducing orientation of information, branding and standardization.

▣ **Performance Indicators**

○ Areas residents satisfaction rate (%)

○ Key leader training (people)

3-3-⑤ Strengthen risk management of agricultural sector

< Goal >

Strengthen disaster response system followed by climate change and livestock diseases in rural areas.

■ Departments organized : Ministry for Food, Agriculture, Forestry and Fisheries

■ Cooperating Authorities : Ministry of Environment

▣ Execution Plan

□ Design rapid response system and minimize outbreak of livestock diseases.

○ Introduce livestock permit in order to administer personnel equipped with basic knowledge for prevention beyond certain size in livestock industry, environmental management, etc.

○ Expand the mandate for all the vehicle (including passengers) and officials to receive disinfection and manage records when allowed in all the farms.

○ Make disinfection and reporting mandatory upon arrival via transit and from countries where livestock farmers disease outbreak has occurred.

○ Install and operate offices on dispersed breeders by using sites such as livestock-related research institutions (Livestock Research Institute, Livestock Technology Center).

○ Strengthen education on clinical observation and examination tips on major livestock diseases such as foot and mouth disease in order for municipalities to boost the examining ability of epidemic control commissioners on livestock.

○ Prepare measures on environment and safety management concerning more efficient process in disposal of cattle carcasses.

□ Establish response system on new disaster from climate change.

○ Promote revision of agricultural disaster prevention act for dealing with the emergence of new disaster.

○ Make unit cost of agricultural disaster support a reality and give agricultural livestock funds.

○ Promote development and dissemination of disaster-resistant vinyl houses, barns, and such agricultural facilities.

□ Provide infrastructure maintenance for facilities that can proactively respond to climate change such as extreme floods and droughts.

○ Enhance safety through strengthening capacity of reservoirs, including pumping and drainage station.

○ Strengthen and manage major facilities for sea level rise, locks, breakwaters, etc.

○ Strengthen flood and drought response system through establishing a comprehensive information system on rural water.

▣ **Performance Indicator**

○ Rising rate in supply item of diagnosis of disease in prevention (%)

3-4 Protect public life from changes in environment

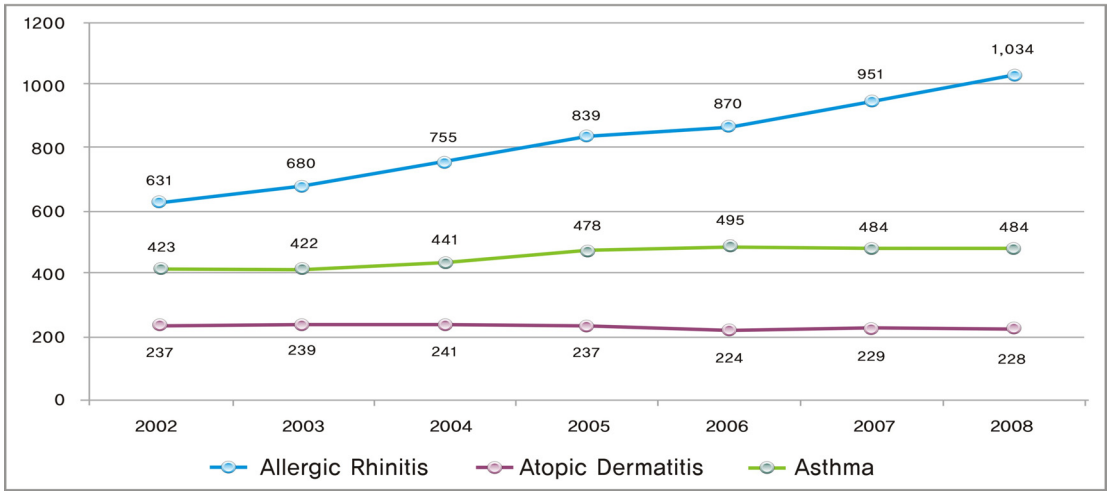
▣ Status Analysis

☐ With the environmental issues raging, there is increased public health impact from environmental pollution.

○ 7.3% of the total population are exposed to air pollution that exceeds the environmental standards.

○ Especially there is increase of environmental disorders among children such as atopy and asthma.

〈Annual trends on main environmental disease per million population〉



Source : Ministry of Health and Welfare

☐ There is great need for disease prevention and response system at the national level.

▣ Direction of Promotion

☐ Establish environment-related disease response system.

☐ Continue the environmental countermeasures to reduce disease-causing organisms.

Indicator	Performance goal		Measurement method
	'10	'15	
Children's Goods Risk Assessment materials ratio (%)	4.4	100	[The cumulative mass balance assessment / overall rating target material (135 species)] × 100
Metropolitan concentration of particulate matter (㎍ / ㎥)	48.7	40	Σ (Average concentration from Jan. to Sept.) / September (except yellow dust days)

3-4-① Strengthen Environment Disease Prevention and Control

< Goal >

Expand countermeasures on damage and prevention from environmental diseases.

■ Departments organized : Ministry of Environment

■ Cooperating Authorities : Ministry of Health and Welfare

▣ Execution Plan

□ Enforce programme on damage prevention and relief from asbestos.

○ Enact "Asbestos Safety Act" for the prevention of asbestos damage and set standards on asbestos-containing materials (talc etc.), designate management area of asbestos naturally occurring, and establish institutional framework such as asbestos cartography of buildings.

○ Enforce "Asbestos Damage Act" and "Asbestos Victim Relief Fund" to compose social safety net.

○ Establish system to prevent and early detect asbestos related diseases such as dedicating specific hospitals in regions to exclusively provide health screening and research on asbestos.

□ Promote measures on environmental disease prevention and damage

○ Expand research on health damage of residents around vulnerable areas of high pollution such as national industrial complex, mines, cement plants, and promote environmental health assessment in surrounding areas of air pollution such as waste disposal facilities.

○ Review relief measures on health damage from environmental hazards such as asbestos.

□ Prevent and manage environmental diseases of the sensitive group such as infant and children.

○ Establish prevention and management measures against atopy and asthma.

○ Expand examination and improvement services on residential environment of vulnerable households of low-income families, young breadwinners.

○ Assess the risk of environmentally harmful factors (20 species) in children's products (70 species) and promote restrictions against hazard criteria.

○ Establish standards on hazardous materials exposure for health protection of both mothers and children.

○ Conduct School Zone Pollution survey and introduce environmental standards for children.

○ Strengthen education on environmental health targeting children, school teachers.

▣ **Performance Indicator**

○ Rate of health impact of metal mining waste to residents (%)

○ Assessment on hazardous materials of Children's Goods ratio (%)

3-4-② Strengthen management of Respiratory diseases from air pollution

< Goal >

Create an atmospheric environment where citizens can safely breathe by strengthening management of hazardous substances in the atmosphere.

■ Departments organized : Ministry of Environment

▣ **Execution Plan**

□ Improve and manage the classification system of air pollutants

○ Systematically classify and manage by substances of monitoring, management and environmental standards, and establish a model to assess standards of physical properties, toxicity, exposure, etc.

○ Establish environmental standards on particulate matter (PM2.5) and strengthen its management.

□ Strengthen management of specific atmospheric toxic substances (HAPs)

○ Introduce facility management standards for reduction of HAPs emissions.

○ Analyze emissions of HAPs according to industries and promote pilot projects in order to push for its legislation.

□ Operate alert system on ozone and particulate matter

○ Enlarge the accuracy rate of forecasting on particulate matter and expand into the major five metropolitan cities.

○ Develop forecasting model on regions with frequently occuring phenomenon of elevated ozone.

□ Promote comprehensive measures for preventing and minimizing yellow dust.

○ Establish management system to prevent yellow dust damage.

- Improve accuracy on yellow dust forecast through strengthening observations and early warning systems on yellow dust.
- Based on the National Early Warning Center for Yellow Dust and the Northeast Asian Yellow Dust Warning Center, establish Northeast Asian Early Warning Center for Yellow Dust.

○ Show leadership through international cooperation in support for dealing with yellow dust in the Northeast Asia.

- Participate in international research programs on yellow dust and such long distance travelling air pollutants, and share advanced technology for further international cooperation.
- Prevent desertification, sand movements and yellow dust through "greenbelts" afforestation project of Mongolia.
  ※ The Gobi desert and grassland (Steppe) zone afforestation transition region (total length 3,500 km).

□ Strengthen management of particulate matter from vehicles

○ Expand dissemination of CNG (Compressed Natural Gas) vehicles, DPF (Diesel Particulate Filter), etc.

- Strengthen the standards on particulate matter emission such as through adjusting the emission standard of particulate matter from diesel vehicles as those standards of advanced countries.
- Expand CNG vehicles and DPF penetration for reducing particulate matter in urban areas and promote renovation for low emission engines.

○ Expand target area for inspections on vehicles.

- Local air quality regulations → metropolitan area population of 500,000 or more.

□ Special management of facilities for large amounts of dust emissions

○ Strengthen emission standards of facilities such as power plants, blast furnace, and strictly apply emission standards in those areas more than normal areas.

- For power plant of more than 50MW or as cogeneration facility of at least evaporation of 40 tons per hour, liquid and solid fuel should be used.

○ Establish real-time management system through chimney TMS (automatic continuous measurement chimney device).

□ Strengthen management of scatter-prone dust sources.

○ Special management of 10 industries causing scatter-prone dust

- Conduct intensive inspection in 10 industries causing scatter-prone dust such as construction, non-metallic material samples manufacturing, processors, etc.

○ Strengthen source of scattered dust such as transporting trucks.

▣ **Performance Indicator**

○ Particulate matter early warning ratio (%)

3-4-③ Advance safety management of hazardous chemicals and hazardous waste materials

< Goal >

Establish institutional framework for reducing environmental and national health dangers caused by toxic chemicals and hazardous waste.

■ Department in charge : Ministry of Environment

■ Cooperating Authorities : Ministry of Employment and Labor, and Ministry of Knowledge and Economy

▣ **Execution Plan**

□ Advance management of hazardous chemicals

○ Improve production system on chemical substances such as production on risk and warning test information of industries, expanding items for hazard assessment and test information to promote a co-production and trading of chemical information.

○ Enhance support on voluntary emission reduction activities of industries through assessing the implementation of voluntary agreement (30/50 program) to reduce emissions chemicals from industries.

- Support emission reduction targets for small and medium-sized industries and strengthen risk assessment and management regionally in areas such as the industrial complex.

○ Train specialized expertise of good laboratory practice (GLP) and expand infrastructure on information production.

○ Establish measures on risk assessment and management, and manage chemical substances that draw international attention (mercury, nano-materials, etc.).

○ Promote R & D on green chemistry, introduce green chemistry award and spread it within the industries.

□ Strengthening chemical incident response

○ Establish DB on Chemical Safety and Hazard Information Integration to

analyze cause of the chemical accidents and utilize in establishing countermeasures.

○ Conduct "Emergency Response Information Services" that provides information in the event of an accident in life due to the misuse of chemical products.

○ Prepare management standard on accident prevention to manage illegal distribution of chemicals that can be improvised into homemade bomb.

○ Conduct relevant inter-agency joint training periodically, secure professional staff to increase on-site response capability in the event of a chemical accident.

□ Improvement of the waste classification system

○ Enlist the existing waste list which is classified into detail such as from source of existing waste, characteristics and generation process of occurrence, etc.

○ Advance the standard of list of waste and harmful substances and reflect the domestically designated waste in the "Act on cross-country movement of waste and its treatment."

○ Establish database on the amount and type of waste to effectively manage those variety of waste from more than one sources.

□ Establish monitoring systems and strengthen management of export and import waste and designated waste.

○ Promote transition into hazardous materials with characteristics (explosive, oxidizing, flammable, etc.) from already existing hazardous substances from domestic and foreign management system on non-hazardous waste (heavy metals and organic pollutants).

○ Establish standard on assessing hazardous properties and on method of test processing methods.

▣ **Performance Indicator**

○ Emissions rate according to business volume on chemical substances reduction (%)

3-5 Strengthen Public Health

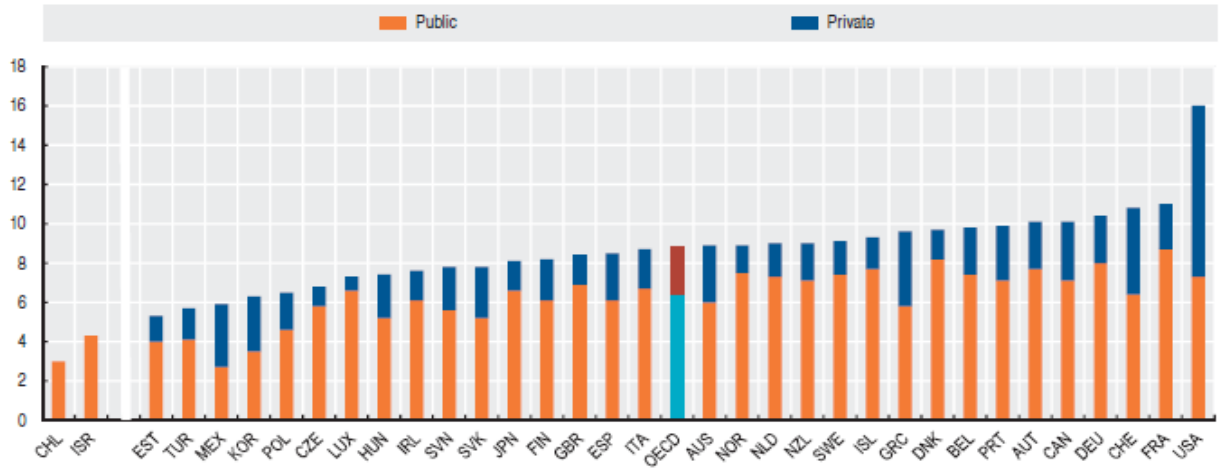
▣ Status Analysis

☐ Due to dissipation of medical resources and lack of government investment, Korea is within the lowest level of public health proportion (29 out of 35 countries) amongst OECD countries.

☐ There is need for expansion of public health and protection of public right to health protection through systematic reformation.

〈Regional OECD health expenditure proportion of GDP〉

Unit(%)



※ Source: OECD

☐ There has been expansion of public health infrastructure with the promotion of "Comprehensive Measures on Expanding Public Health Infrastructure 2005 ~ 2009," however there still lacks essential health care services.

○ Therefore 85.6% progress in preparation for 5 years financial plan (4.3 trillion won) in investing 3.7 trillion won.

○ Expand public health infrastructure centered around public hospitals in local areas such as cancer center, cardiovascular and brain center, children's hospital, etc. (600 billion scale).

○ In order to increase publicness of medical cares such as protection of national right to health and essential medical services, there is need to switch to public health care policies that includes private medical institutions.

○ There is need to nurture into an efficient system concerning essential health care that lacks profitability and shortage of supply, without distinction of public and private sector.

▣ Direction of Promotion

□ Expand regions on public health benefit and protection of right to health protection through health system reform.

□ Provide stable supply of essential public goods on emergency, delivery, blood etc. through expansion of supply base on essential health care services.

Indicator	Performance goal		Measurement method
	'10	'15	
Specify the base medical facilities and support medical	-	20	"Law on public health," according to the medical center medical support designation
Average Life expectancy (years)	80.8	81.4	Simultaneous born population is expected to survive for the next number of years

3-5-① Efficiency of public health care system

< Goal >

Stable supply of health services through improving public health care system.

■ Departments organized : Ministry of Health and Welfare

▣ Execution Plan

□ Improve public health service delivery system that lack profitability.

○ Expand public health service network through health funding (facilities and operation), involvement of local residents and fiscal transparency of private medical institutions that participate in public health services.

□ Designate areas that lack significant medical supplies and strengthen medical service supply through medical institutions support.

□ Designate and support public specialty care centers for those sectors with low profitability and supply.

※ First review on children's Hospital, severe trauma, neonatal intensive care.

▣ Performance Indicator

○ Ratio on public sources from medical expenses (%)

○ Annual number of completed professional medical centers (operating)

3-5-② Expand Essential Health Care Safety Network

< Goal >

Expand supply base of essential health care services through strengthening state support.

■ Departments organized : Ministry of Health and Welfare

▣ Execution Plan

☐ Ensure required isolation wards, equipment and drugs centered in public hospitals and strengthen response system and disease control of infectious diseases of local government.

☐ Strengthen national support of essential public goods with supply challenge due to emergency and market, and promote private investment.

☐ Support and promote establishment of obstetrics and gynecology at vulnerable regions on childbirth.

▣ Performance Indicator

○ Number of support (solution) on essential health care sector such as emergency, delivery, etc.

4 Improve Sustainability of Economic and industrial structure

4-1 Compose resource recycling economy and society

▣ Status Analysis

□ Need to change the industrial structure on reducing greenhouse gas emissions

○ There is highest energy consumption around the industrial structure with 57% in industrial sector and manufacturing sector (occupies 94% among industrial sector consumption) in particular.

○ There is need to develop market for resource recycle due to recent increase in quantity of food waste, construction waste etc.

□ There is need to raise efficiency in management and reduction in waste through establishing an integrated waste management system.

○ Secure feasibility in waste disposal and recycling.

○ Preemptively respond to the changing trends at home and abroad in managing toxic chemicals.

▣ Direction of Promotion

□ Improve resource efficiency and recycle through industrial structure on resource recycling.

□ Establish active base for reduction of food waste and resource recycling.

Indicators	Performance/Goal		Measurement method
	'10	'15	
Construction rate of recycling information systems (%)	20	100	(Resource Recycling Information System Performances / Planning) x100
Recycling of waste (%)	80	90	(Waste, recycling / waste) x100

4-1-① National Integrated Management System on Resource Recycling

< Goal >

Prepare base for resource recycling by establishing an integrated management system on resource recycle.

■ Departments organized : Ministry of Environment, Ministry of Knowledge Economy

▣ Execution Plan

□ Establish and operate national resource circulation information systems

○ Establish and operate Material Flow Analysis (MFA), and resource circulatory system.

- Promote resource flow analysis by regions and industries for securing use of resources in manufacturing and productions.
- Establish and operate a management system for providing information on resource flow analysis to the central government agencies, municipalities, emitters, recycling business operator, etc.

□ Establish and operate resource recycle evaluation system

○ Systematic management of information on product resource management and establish management system on resource recycling assessment for providing information.

○ Classify basic information according to range of resource recycling assessment of products and develop software for business self-assessment.

□ Develop and disseminate module in conjunction with the Albaro system that provides information on waste materials.

○ Enhance user comfort and dual-input data prevention by applying modules in conjunction with the Allbaro system and self management system of waste within emission industries.

- Expand distribution of modules in connection with Allbaro system and expand operation of real-time operating system on waste management for upright disposal of waste.

※ Allbaro system: A real-time integrated information system that manages the entire process of waste discharge to disposal via internet.

○ Expand linking service of business that emits waste in bulk and develop module that can be applied up to small and medium-sized businesses and enable its operation.

▣ **Performance Indicator**

○ Construction ratio of recycling information system (%)

4-1-② Establish Active basis of Market-leading Resource Recycling

< Goal >

Establish basis for active resource recycle through developing waste recycling market.

■ Departments organized : Ministry of Environment

▣ Execution Plan

□ Secure feasibility on waste collection scale

○ Improve waste treatment facilities (incineration and landfill) divided by municipalities and grant incentives to local governments and public treatment facilities.

○ Expand business areas of waste collection and transportation into national scale and ultimately expand them.

- Promote amendments of the current municipal ordinance and its reflection to the regulations on waste management act.

○ Integrate industries of acquisition, transport, recycling and disposal, train large integrated processing contractor and expand fund for skills development.

□ Improve distribution structure of resources circulation

○ Make it obligatory to display information on final product labelling such as on recyclability, quality, weight, etc. and expand products to disclose information on recycling (revision on the promotion of Law on Saving and Recycling of Resources).

□ Expansion of demand-driven recycled products

○ Encourage priority purchase of precious metals and rare metals extracted from recycling through public purchase.

○ Provide stable supply through expansion of stockpiling of mainly rare and recycled metals.

▣ **Performance Indicator**

○ Ratio of waste recycling (%)

4-1-③ Expand Food Waste Reduction and Promotion of Recycling Business

< Goal >

Induce reduction of waste generating source through promoting comprehensive measures for food waste reduction.

■ Departments organized : Ministry of Environment

■ Cooperating Authorities : Ministry for Food, Agriculture, Forestry and Fisheries, Ministry of Health and Welfare

▣ Execution Plan

□ Prepare comprehensive measures by joint ministries to reduce food waste

○ Reduce food waste generated by 20% up to 2012.

○ Establish and operate a taskforce team by joint ministries to reduce food waste.

□ Improve measures for food waste reduction and promote customized measures.

○ Establish measures on customized reduction of food waste.

- Fully implement the usage based system of food waste and promote policy on its control by local governments.

○ Promote measures on customized reduction of food waste by sectors.

- Prepare customized measures where it occurs by sectors such as public institutions, highway rest areas, hotels, hospitals, funeral homes, schools, restaurants, etc.

○ Promote practical collaboration system between public and private sectors.

- Establish nationwide movement on improving food culture centered around private organizations and develop it into private sector-led campaign.

□ Reduction of food waste through education and publicity on improving food culture.

○ Promote private organizations for publicity and prepare basis on education for National Action Campaign.

- Develop "instructor pool" of experts from civil society and related areas by regions, and support education in restaurants, schools, military camps, etc.

- Supply various educational materials that considers the target, age etc.

- Promote participation through campaigns and events with private organizations, manufacturers, and etc.

○ Enhance general public promotion on improving food culture.

- Expand publicity through TV, radio, newspaper and billboard ads to reach a larger public.

- Hold regular contest exhibits concerning good practices on food waste reduction and enhance people's interest and participation.

□ Prepare basis on expansion of food waste recycling business

○ Prevent negative disposal from low-cost bid and pursue high value-added methods through applying "assessment criteria on eligible companies for food recycling disposal."

○ Review introduction of brand for recycled products.

▣ **Performance Indicator**

○ National Awareness on Food Waste Reduction

○ Reduction rate of food waste (%)

4-2 Establish Sustainable Economic Structure

▣ Status Analysis

□ There is need to compose sustainable economy structure through establishing sustainable production and consumption systems.

○ Environmental pollution reduction and resource conservation through the use of green products.

○ Convert management system of businesses suitable for sustainable economy structure.

○ Strengthen regulations against pollution in the developed countries and encourage production of green products.

□ There is need to expand investment on low carbon technology in establishing foundation to sustainable economic development.

○ Design systematic structure of low-carbon technologies development projects through preparing plans on domestic low-carbon technologies R&D.

※ Domestic low-carbon technology level is of 50-70% level compared to developed countries.

▣ Direction of Promotion

□ Realize low-carbon society and secure efficiency of economic structure through establishing system of environmentally friendly production, consumption and business management.

Indicator	Performance/Goal		Measurement method
	'10	'15	
Market Share of Green Product (trillion Won)	14.8	20	Total annual sales of eco-label certified products

4-2-① Expand Sustainable Consumption System through Active Green Consumption

< Goal >

Prepare institutional framework for expanding use of green products on all main agents of economies.

■ Departments organized : Ministry of Environment

▣ Execution Plan

□ Expand green consumption culture in various economic agents such as the public, industry, citizens.

○ (Public sector) Introduce green consumption system that considers from purchase to use of green products.

○ (Industrial sector) Configure and expand sectoral council for green consumption.

○ (General public) Promote national movement on low-carbon green consumption.

- Green Start, Eco-Family, Green Coordinator, National Network one green household etc.

□ Expand information on green products and promote life-support measures on green consumption.

○ Expand low-carbon eco-labels on products and energy efficiency rating system for expanding low-carbon green product.

○ Distribute nationwide the green network.

- Green Product Store (Green Store), recycling store, green consumption support center.

□ Strengthen public institutions based on green product consumption

○ Gradually expand target institutions on compulsory purchase, reflect performance on green products consumption and publicize purchase records.

○ Assess implementation conditions by establishing support system for public institutions implementing compulsory purchase, and assess creation of market and impacts.

○ Establish standard ordinance and expand system on promoting green consumption by public institutions such as recommending green consumption ordinance.

○ Reflect green products consumption on contract-related documents etc.

▣ **Performance Indicator**

○ Number of green retail store

○ Government Green Product Purchases rate

4-2-② Expand Sustainable Production system

< Goal >

Establish sustainable production systems of all industries and strengthen competitiveness among green products.

■ Departments organized : Ministry of Environment, Ministry of Knowledge Economy

▣ Execution Plan

□ Support sustainable production system

○ In response to international environmental regulations, accelerate the deployment of a joint response system of domestic industry.

○ Develop and expand techniques on environmentally-friendly product design that considers diffusion of ErP (Energy related Products) guidelines.

※ ErP : EU guidelines on Eco-friendly design for energy-related products

○ Improve the sustainability of domestically produced products through establishing environmental policies on Korean products.

□ Sustainable development and dissemination of production technology

○ Implement "Technology dissemination project" whereby newly processed and improved technology is supplied at the actual site of industries.

○ Provide core technology through operation of "technical support center" connected to business organizations and therefore support commercialization.

○ Establish cleaner production and ecological buildings within industrial complexes.

□ Expand environmental management in the industrial sector

○ Utilize the large network of parts suppliers and the large companies to spread the environmental management system for small and medium-sized businesses, and establish green partnership between large enterprises and SMEs.

○ Develop and expand environmental management-related techniques to facilitate companies leverage such as product's life cycle assessment (LCA), Environmental Management Accounting (EA), Environmental Performance Evaluation (EPE), etc.

○ Establish industry and company-specific environmental management systems, and implement diagnosis and guideline to support techniques application.

○ Introduce environmental management centered around local government, and diagnose by regional bases that supports implementation and provide support.

○ Train professional consulting agencies that support environmental management of SMEs.

□ Activate industries on products from renewable resource recycling and reuse.

○ Introduce quality certification system for product reliability and technological development support for dissemination.

○ Establish overseas market through designating and operating specialist research institutes on recovery, and promoting international cooperation.

○ Develop technologies on recovery and recycling technologies and train technical personnel on its dissemination.

□ Establish sustainable financial infrastructure

○ Expand policy funds concerning green technology and Industry, green enterprises, social enterprises, etc.

○ Expand evaluation techniques of sustainability on public social services.

○ Reflect corporate sustainability in bank loan and investment activities.

▣ **Performance indicator**

○ Number of companies with environmental management

○ Number of product quality certification on recycled product

4-2-③ Sustainability management through the spread of industrial competitiveness

< Goal >

Establish industrial structure that can respond to the international pattern and standards by preparing a system and organization for sustainable management of companies.

■ Departments organized : Ministry of Environment, Ministry of Knowledge Economy, Small and Medium Business Administration

■ Cooperating Authorities : Ministry of Employment and Labour

▣ Execution Plan

□E stablish an organization dedicated to sustainability of the private sector.

○ Research measures to spread Corporate Social Responsibility (CSR) such as through national trend research, development guidelines, surveys, corporate social contribution through support for small and medium-sized enterprises and spread best practices.

○ Develop various schemes and incentives such as rewarding excellent corporate, development support programs, certification etc.

○ Expand exchanges and cooperation with relevant organizations abroad.

□ Establish sustainable public-private consultative body

○ Select the consultative group according to sectoral representation, professionalism, and nonprofitable selection, and authorize those that well qualifies to represent the country during outreach activities.

○ Reflect the agreed items of public-private council in the relevant policies and strengthen its role.

○ Activate participation through empowering its function such as operate award scheme, inspection on labeling, host forums and seminars.

□ Prepare evidence for sustainability management and authorize incentives

○ Practice sustainability management by reflecting on related laws and regulations such as the Industry Development Act, and etc.

○ Expand channels of communication and regularly conduct multi-point communication.

○ Apply in phases from certain size of companies, and spread to computerization through development and sharing of practical knowledge.

○ Assess corporate sustainability and designate the excellent performing corporate, provide points concerning giving labels and points, and give necessary incentives.

□ Respond on the standards sustainable management

○ Introduce ISO26000, establish and amend legislation, and strengthen standardized response system.

○ Analyze the gap with international standards, and take measures to eliminate such gap.

○ Participate in development of ISO26000 and reflect upon the opinions of local stakeholders.

□ Support sustainability and advancement of SMEs

○ Support to improve diagnosis and consultancy on improving small and medium-sized enterprises.

- Support consultancy focused on assignments with higher impact on improving sustainability through diagnosis on sustainable management.

- Publicize and give preference to excellent companies through assessing their ability on reducing Corporate greenhouse gas emissions and environmental pollution.

○ Establish joint Green supply chain management (SCM) on small businesses that export intermediate products or finished goods.

○ Facilitate for establishment of green factories through high efficiency on energy and greenhouse gas, and reduction of environmental pollution.

▣ **Performance Indicator**

○ Number of companies issuing reports on sustainable management

4-2-④ Low-carbon technology development and growth engine

< Goal >

Expand infrastructure for low-carbon technology development and industrial development.

■ Departments organized : All department

▣ Execution Plan

□ Expand low-carbon technology development strategies and strengthen foundation on investments.

○ Give priorities on the R & D Investment of low carbon technologies development and increase its importance.

○ Strengthen result management of research on low carbon technology commercialization.

○ Establish institutional framework for promoting low-carbon technology transfer and its commercialization.

○ Strengthen financial cooperation between industry-academy-research for finding promising low-carbon technologies and promote commercialization.

○ Develop indicators on low-carbon technology finance of private and policy financing institutions and expand of financial support.

□ Train core workforce on low-carbon technologies

○ Promote systematic workforce training by sectors on low carbon technology.

○ Train specialized leading workforce on future research according to area-based and core-industrial specialization.

□ Establish structure on leading global assessment, certification, and standardization.

○ Strengthen system on professional standardization by sectors such as low-carbon technology assessment and certification.

○ Strengthen infrastructure of assessment, certification and standardization on low-carbon technologies.

□ Establish industries on low carbon technologies of new growth engine.

○ Develop manufacturing equipment which are high-efficient and low-cost source of generation technologies such as solar cells and fuel cell and localize such equipments.

○ Create infrastructure and market venture on renewable energy such as solar cells, fuel cells.

□ Develop carbon cycle models through the development of low-carbon agricultural technology and field demonstration.

○ Develop environmentally-friendly agricultural models of energy and resource recycling, and which is 'ZERO pollution.'

- (Biomass model) eco-friendly cattle shed and manure treatment plant / steam supply and power generation.
- (Resource Recycling packaging models) Circular process of Barley / green manure / corn / rice and spray of liquefied manure.

○ Minimize carbon emissions through Life Cycle Inventory (LCI) for major agricultural and livestock products and agricultural materials.

○ Promote low-carbon eco-agricultural consumption through assessment on carbon diffusion within the process of production, distribution and consumption of agricultural products.

□ Establish pellet supply infrastructure and carbon cycle system

○ Establish a batch system by regions from raw material supply to the local unit of production, distribution and consumption for stable supply of pellets.

○ Install production facilities around favorable regions in securing raw materials on pellets and promote the diversification on user facilities.

※ Pellet production scale (ten thousand tons): 20 (2013) → 25 (2015), consumption-scale (ten thousand tons): 12 (2013) → 15 (2015)

▣ **Performance Indicator**

○ Investment scale on low carbon technology development (hundred million KRW)

4-2-⑤ Promote development of environmental technology and industry

< Goal >

Strengthen international competitiveness of environment industry through environmental technology development and professional consultants training.

■ Departments organized : Ministry of Environment

■ Cooperating Authorities : Ministry of Knowledge Economy, Ministry of Education, Science and Technology, Ministry of Employment and Labour

▣ Execution Plan

□ Promote EI (Eco-Innovation) business for expanding promising technology on green growth of environmental field.

○ Develop basic core fusion technology on environment that can advance into the future environment market and core environmental technology development for pollution reduction.

□ Expand environmental industries through expanding its demand

○ Establish strategies on green environmental commercialization and expand support on management consultation.

○ Promote investment on environmental sector through financing support on pollution prevention facilities of corporate.

○ Foster focused growth on industries of newly established areas on environment such as climate industry, biological industry, REACH, environmental health industry etc and expand demand for monitoring and measuring equipment.

□ Establish system on environmental industries statistics that serves green growth

○ Establish guidelines on statistical survey for establishing customizable policies on environment industries.

○ Establish green classification system (2013) that considers Korea Standard Industrial Classification (KSIC).

○ Assess and analyze environmental industry survey according to the green environment industry classification.

□ Develop GGI (Green Grade Index) that can measure and evaluate level of green business and promote training experts

○ Develop diagnostic indicators of five main areas such as on climate change, green energy, Green IT, environmental regulations, corporate social green practices, and designate corporate with excellent green practices.

○ Foster consultants on green level diagnosis related to environment and management, and support on cost on reviewing corporations.

○ Strengthen REACH (Registration, Evaluation, Authorization and restriction of Chemicals) for promoting management on climate change and hazardous materials, carbon trading, and strengthen consultation such as on asbestos safety.

□ Expand environmental overseas markets and exports

○ Identify promising environmental projects and develop new international market on environment.

- Actively pioneer new environmental markets in Central Asia, Africa, Middle East, Central and South America.

○ Expand demonstration projects on green environmental technology in developing countries.

- Spread Korea's environmental technologies around the world through project-based businesses with demonstration.
- Promote matching fund with related countries for guarantee on the adoption of certain technologies.

○ Support feasibility study projects on for expanding small and medium sized businesses to expand overseas with green projects and host consultations by inviting buyers from strategic regions.

○ Establish human network of environmental experts by inviting international experts and managing an integrated information network.

▣ **Performance Indicator**

○ Environmental Industry Sales Growth rate (%)

○ Environmental Industry Exports (trillion won)

4-3 Expand Efficiency of energy use

▣ Status Analysis

□ In order to respond to high oil prices and climate change, low energy high-efficiency strategies is needed.

○ Countries have recognized that one of the most effective means for CO_2 reductions and energy savings is through energy efficiency and renewable energy expansion.

- Japan has set goals on 30 percent improvement in energy efficiency by 2030 while EU has established the strategy of the 20-20-20 (20 percent improvement in energy efficiency by 2020).

□ There is increase in energy independence with the establishment of sustainable energy system.

○ There is promotion on energy independence and energy efficiency through the low energy consumption industrial structure.

▣ Direction of Promotion

□ Expand energy independence through management of efficient energy demand and renewable energy supply.

□ Strengthen national competitiveness through economic structures on low energy consumption.

Indicator	Performance/goal		Measurement method
	'10	'15	
Share of renewable energy supply (%)	2.54	4.33	(Current year and renewable energy supply / Annual Energy Consumption) × 100
Energy Unit (TOE/1,000$, based on PPP of 2000)	0.197 ('09)	0.178	Total energy consumption (TOE) / Real GDP (thousand $, PPP)

4-3-① Increase national energy independence

< Goal >

Lay a foundation for a stable energy supply and demand of land and cities through expanding efficiency on energy demand management and renewable energy supply.

■ Departments organized : Ministry of Knowledge Economy

■ Cooperating Authorities : Ministry of Environment

▣ Execution Plan

□ Energy efficiency and integrated demand management system

○ Integrated Energy (local cooling and heating) supply

- Expand local heating service by utilizing waste heat and residual heat.
  ※ (2010) 207 areas → (2015) 283 areas

- Promote district cooling projects to reduce power load during summer peak.
  ※ Demonstration projects in Ansan, Gwanggyo and through research services, plan to spread to fifty thousand households by 2015.

○ Enhance demand management related to the public energy companies (sellers) such as Korea Electric Power Corporation, Korea Gas Corporation, Korea District Heating Corporation, and expand mandatory scheme (EERS) on energy efficiency.

- Operate system oriented to Investment Plan on Demand Management.

※ EERS (Energy Efficiency Resource Standard) : Energy savings target given to the energy provider, and incentives given according to the implementation of goals (conducted in six countries including the US, Italy, France).

□ Expand mandatory renewable energy supply system

○ Review the introduction of institution on market-based renewable energy generation sector (RPS).

- Impose a duty to supply renewable energy of certain percentage of the total energy supply (duty ratio) to the contractor.
- Boost energy supply efficiency through competition between significant increase in renewal energy supplies and carriers and energy source through introducing RPS.
  ※ After introduction in 2012, 10% duty ratio coverage goal by 2020.

○ Review introduction mandatory mixed use of biofuels and transportation fuels.

□ Expand waste resource transition to clean energy and its supply

○ Expand clean energy supply and production of variable solid fuels (RDF) that utilizes pulmonary resources.

○ Waste resource maximum efficiency

- Configure information network on energy. Maximize energy efficiency through centralizing and regulating facilities on waste resource.

□ Promote development of strategic offshore resources

○ Expand and promote effective strategy

- Implement the 4th master plan on overseas resource development promote cooperation on industrial nuclear energy in conjunction with related sectors.

○ Lay foundation for energy cooperation

- Enhance ODA support for underdeveloped countries and promote personnel exchanges between ministries on energy between countries.

▣ **Performance Indicator**

○ Share of renewable energy supply (%)

4-3-② Building low energy consumption economic structure

< Goal >

Establish a sustainable energy system through pursuing low cost and high efficiency in energy and economic sector.

■ Departments organized : Ministry of Knowledge Economy

■ Cooperating Authorities : Ministry of Land, Transport and Maritime Affairs

▣ Execution Plan

□ Seek low energy consumption society through high efficient and energy saving projects.

○ Promote energy-efficient land use through consultation on energy use in large-scale development projects, local government planning in energy areas, etc.

○ Improve energy efficiency in industrial sector through promoting equipment efficiency, energy conservation facilities investment, innovation and support for voluntary process, etc.

○ Improve energy efficiency in transport sector through improving national distribution system, enabling public transportation.

○ Improve energy efficiency at homes, industries and public sectors through promoting for upgrading the cooling and heating appliances.

○ Establish market-friendly energy saving projects such as small cogeneration, CES (Electronics Show) Business, Energy Service Company (ESCO) development, in order to enhance energy conservation policy and expand the certification of energy-saving products.

▣ Performance Indicator

○ Energy unit (TOE/$ thousand, based on PPP of 2000)

○ Energy efficient equipment results dissemination (%)

4-3-③ Advancement of energy technology development system

< Goal >

Unify energy technology development-related work and establish technology innovation system

■ Departments organized : Ministry of Knowledge Economy

■ Cooperating Authorities : Ministry of Education, Science and Technology

▣ Execution Plan

□ Promote integrated technology within energy and resources sector

○ Establish innovative technology system for sustainable energy.

○ Create and promote TRM (Technical Road Map) of energy and resources sector.

○ Centralize various research development projects that were done under various sectoral acts into single long-term act.

□ Industrialize value-added energy and resource

○ Secure independent energy and resource technology as means of future growth engine for high-value industrialization.

○ Create new industries in energy through industrial fusion and mixture.

▣ Performance Indicator

○ Public sector investment on energy technology development (hundred million won)

4-4 Human resources and job creation

▣ Status Analysis

□ There is growing strategic investment among the developed countries for expanding human resources and green jobs through green technology and green industry development.

○ The US has put $ 500 million investment for vocational training programs and research on skilled workers of energy efficiency and renewable energy through ARRA (American Recovery and Reinvestment Act).

□ In order to secure jobs and growth engines, Korea has committed to invest 50 trillion won in 36 'Green New Deals' between 2009-2012, which will create about 960 thousand jobs.

○ In 2007, Korea has scarcity rate of 5.74% and is world's 40th in job opportunities of excellent industrial and technical personnel such as engineers and skilled workers.

▣ Direction of Promotion

□ Establish basis for low carbon green growth through human resource development linked to green industry.

□ Expand job creation in the sectors of green technology industry.

Indicator	Performance/goal		Measurement method
	'10	'15	
Green Technology · Industrial research manpower (ten thousand)	2.7	5.7	27 focus on green technology, human resources specialist with completion in training courses
Employment rate (%)	63.8 ('08)	64.3	Productive population (above 15 years old), the ratio of the employed

4-4-① Expansion of advanced degree programs and experts development

< Goal >

Develop specialized workforce through developing advanced degree programs related to green technology and industry.

■ Departments organized : Ministry of Education, Science and Technology

■ Cooperating Authorities : All departments

▣ Execution Plan

□ Designate and operate specialized graduate schools

○ Nurture high-level experts and set up regular curriculum in graduate schools on core green technologies and industries by reviewing long-term supply situation.

- Renewable energy sector (hydrogen fuel cells, solar, wind, bio), the field of climate change, convergence technologies, and complex and combined technology sectors.

- Based on mid and long-term supply outlook appearance (year), conduct research activities and establish academic and research cooperation of leading model on research and masters and doctoral degree studies.

- Foster advanced workforce on knowledge-based environmental services.

□ Foster multidisciplinary graduate school

○ Develop graduate school that is equipped with systematic interdisciplinary curriculum for fostering professional workforce.

- Improve competency of graduate school system and develop interdisciplinary curriculum.

▣ Performance Indicator

○ Satisfaction level of expert nurturing process (%)

4-4-② Leading expertise in human resources

< Goal >

Nurture technical expertise personnel tailored to meet the future expert demand on technology.

■ Departments organized : Ministry of Education, Science and Technology

■ Cooperating Authorities : All departments

▣ Execution Plan

□ Nurture expertise in green technology

○ Nurture leading scientists of world-class through expanding support on green growth R & D infrastructure.

- Develop customized workforce according to corporate demand sectors such as environment, energy efficiency, renewable energy, climate change.

○ Nurture consultants in green management

- Systematically promote green management and technology through expertise development in conjunction with universities and the existing workforce of consultants.

□ Nurture greenhouse gas management expertise

○ Develop manpower customized to carbon market.

○ Designate and manage verification agency on greenhouse gas emissions and train verification auditors.

○ Introduce qualifications system on greenhouse gases information coordinator and promote employment of information coordinators at the place of emissions a mandatory requirement.

▣ Performance Indicator

○ Green Technology and Industry research manpower (10 thousand)

4-4-③ Creation of green technology jobs

< Goal >

Promote job creation through green technology development and research projects.

■ Departments organized : All departments

▣ Execution Plan

□ Expand infrastructure for creation of green jobs

○ Establish high-efficiency and high-performance-oriented green workshops.

○ Introduce Green-friendly national technical qualification maintenance (Green Certification).

- Reform the existing certification by including the eco-friendly scope.

○ Establish comprehensive information network on green jobs

- Apply DB on green jobs supply and demand and establishment of linked employment information systems in the related businesses.

□ Establish new jobs through major 27 green technology development and commercialization priorities.

○ Job creation in fields such as energy sources technology (9), high energy efficiency technologies (4), greening industry space technology (5), resource recycling technology (8), non-polluting technology (1).

□ Create demand for green workforce through green IT training and IT convergence industry.

○ Promote greening of Green IT sector (three core tasks such as green IT products, promote greening of IT services) and IT convergence industry.

▣ Performance Indicator

○ R&D expenditure rate per GDP (%)

4-4-④ Foster job creation through social enterprise

< Goal >

Supply sustainable job offer to the vulnerable group through development of social enterprise and revenue generation model.

■ Departments organized : Ministry of Employment and Labor

■ Cooperating Authorities : All departments

▣ Execution Plan

□ Excavate and foster social enterprise centered within civil society

○ Foster social enterprise network through regional support agencies.

□ Provide sustainable jobs through expanding participation of companies in corporate social responsibilities.

○ With support agencies, seek ways to expand the participation of large corporate.

○ Strengthen management support via improved business environment.

- Amend "Taxation Special Cases" and "Fair Trade Act" to improve business environment of social enterprises.

- Develop and spread accounting program dedicated to social enterprise therefore strengthen management support.

□ Activate social enterprise within all departments

○ Designate departmental social enterprises at the preliminary level and, introduce and manage authentication and support for excavating social enterprises.

○ Support development of business channel utilizing public market such as secure paths for fund raising and financial support job opportunities.

▣ Performance Indicator

○ Number of social enterprise authentication (accumulated)

Appendix

Appendix 1

Authorities for action plans

Appendix 1 Authorities for action plans

action plan	Authority	Cooperating Authority
1. Enhance sustainability of the environment and natural resources		
1-1. Strengthen integrity and structure of land and city		
1-1-① Strengthening the integration of land and urban management	Ministry of Environment, Ministry of Land, Transport and Maritime Affairs, Ministry for Food, Agriculture, Forestry and Fisheries, Korea Forest Service	-
1-1-② Establish integration system on national spatial data	Ministry of Land, Transport and Maritime Affairs	Ministry of Public Administration and Security, Ministry of Environment, Ministry for Food, Agriculture, Forestry and Fisheries, Korea Forest Service, Cultural Heritage Administration, local government
1-1-③ Urban expansion and strengthen networks of ecological space	Ministry of Environment, Ministry for Food, Agriculture, Forestry and Fisheries, Ministry of Land, Transport and Maritime Affairs, Korea Forest Service	Meteorological Agency
1-2. Sustainable Forest Management		
1-2-① Valuable forest resource development	Korea Forest Service	Ministry for Food, Agriculture, Forestry and Fisheries, Ministry of Environment

action plan	Authority	Cooperating Authority
1-2-② Expanding forests Services	Korea Forest Service	Ministry for Food, Agriculture, Forestry and Fisheries, Ministry of Environment
1-3.Sustainable coastal marine environmental management		
1-3-① Integrated management system of coastal and marine area	Ministry of Land, Transport and Maritime Affairs, Ministry of Environment	-
1-3-② Create a clean and lively coastal and marine environment	Ministry of Land, Transport and Maritime Affairs	Ministry of Environment
1-3-③Maintain coastal biological diversity	Ministry of Land, Transport and Maritime Affairs	Ministry of Environment
1-3-④ Building a sustainable fishery systems	Ministry for Food, Agriculture, Forestry and Fisheries	-
1-4. Enhance soil management systems		
1-4-① Improve soil management criteria and strengthen evaluation	Ministry of Environment	Ministry for Food, Agriculture, Forestry and Fisheries
1-4-② Strengthen preventive system of soil contamination	Ministry of Environment	-
1-4-③ Strengthen soil management in vulnerable areas	Ministry of Environment	-
1-4-④Technology and Industry development of soil environment	Ministry of Environment	-
1-5. Design basis for sustainable wetland management		
1-5-① Convert from sporadical to broad-based wetland management	Ministry of Environment, Ministry of Land, Transport and Maritime Affairs	Ministry for Food, Agriculture, Forestry and Fisheries, Korea Forest Service
1-5-② Introduction of advanced management system of wetlands	Ministry of Environment, Ministry of Land, Transport and Maritime Affairs	Ministry for Food, Agriculture, Forestry and Fisheries, Korea Forest Service

action plan	Authority	Cooperating Authority
1-5-③ Prepare a harmonized bsiss for conservation and use of wetlands	Ministry of Environment, Ministry of Land, Transport and Maritime Affairs	Ministry for Food, Agriculture, Forestry and Fisheries, Korea Forest Service
1-6 Secure biodiversity		
1-6-① Ensure diversity of biological resources	Ministry of Environment	Ministry for Food, Agriculture, Forestry and Fisheries, Korea Forest Service
1-6-② Measures for ecosystem conservation in DMZ	Ministry of Environment	Korea Forest Service, Ministry of Unification, Ministry of National Defense, Ministry of Land, Transport and Maritime Affairs
1-6-③ Strengthen protection of endangered plants and animals	Ministry of Environment	Ministry for Food, Agriculture, Forestry and Fisheries, Korea Forest Service
1-6-④ Strengthen management of invasive species that alter ecology	Ministry of Environment	Ministry for Food, Agriculture, Forestry and Fisheries, Ministry of Land, Transport and Maritime Affairs, Korea Forest Service
1-6-⑤ Risk assessment of genetically modified organisms to ecosystem mechanisms.	Ministry of Environment	Ministry for Food, Agriculture, Forestry and Fisheries, Ministry of Health and Welfare, Korea Food & Drug Administration
1-7. Sustainable Water Resource Management		
1-7-① Establish policies on Sustainable management of water	Ministry of Land, Transport and Maritime Affairs, Ministry of Environment	Meteorological Agency

action plan	Authority	Cooperating Authority
1-7-② Expand the reliable supply of water resources	Ministry of Environment, Ministry of Land, Transport and Maritime Affairs	-
1-7-③ Strengthening sewage treatment facilities and management	Ministry of Environment	-
1-7-④ Expand development of green alternative water and water reuse	Ministry of Environment	-
1-7-⑤ Water demand management mechanisms through realization of water value	Ministry of Public Administration and Security, Ministry of Environment, Ministry of Land, Transport and Maritime Affairs	Local government
1-8. Sustainable prevention of natural disasters		
1-8-① Building national disaster response system	Ministry of Land, Transport and Maritime Affairs, NEMA	Meteorological Agency
1-8-② Improve disaster recovery system to prevent repeated damage	NEMA	
1-8-③ Prevention of climate change caused disasters	NEMA	
1-8-④ Stable settlement of consumer-driven insurance on flood damage	NEMA	Ministry of Strategy and Finance
1-9. Education and Public Relations for Sustainable Development		
1-9-① Establishment of Education basis for Sustainable Development	Ministry of Environment	Ministry of Education, Science and Technology, Ministry of Strategy and Finance
1-9-② Promote publicity basis on sustainable development	Ministry of Environment	All departments
1-10. Strengthen international cooperation for sustainable development		
1-10-① strengthening international cooperation network for Sustainable development	Ministry of Environment, Ministry of Knowledge	-

action plan	Authority	Cooperating Authority
	Economy, Ministry of Education, Science and Technology	
1-10-② Promote expansion and greening of ODA (Official Development Assistance)	Ministry of Foreign Affairs and Trade, Ministry of Strategy and Finance	All department
2. Adaptation to climate change and response mechanisms		
2-1. Reduction of greenhouse gas emissions by sector for carbon reduction		
2-1-① Promotion of greenhouse gas emissions reduction by sector	Ministry of Knowledge Economy	Ministry of Environment
2-1-② Promote greenhouse gas emissions reduction in the building sector	Ministry of Land, Transport and Maritime Affairs	Ministry of Knowledge Economy, Ministry of Environment
2-1-③ Promote greenhouse gas emissions reduction in the transport sector	Ministry of Environment, Ministry of Land, Transport and Maritime Affairs	Ministry of Knowledge Economy, Ministry of Public Administration and Security
2-1-④ Promote greenhouse gas emissions reduction in the waste sector	Ministry of Environment	-
2-1-⑤ Promote greenhouse gas emissions reduction in the food, agriculture, forestry and Fisheries sector	Ministry for Food, Agriculture, Forestry and Fisheries	Rural Development Administration
2-2. Transparency of carbon emissions sources		
2-2-① Development and management of disclosure indicator on carbon	Ministry of Environment	Ministry of Knowledge Economy
2-2-② Promote active disclosure of carbon information by division and target	All department	-
2-2-③ Establish and operate national statistics on greenhouse gas emissions	Ministry of Environment	All department
2-3. Expand sustainable carbon sinks		
2-3-① Expand forest carbon sinks	Korea Forest Service	-
2-3-② Develop bio-circular forest	Korea Forest Service	-

action plan	Authority	Cooperating Authority
2-3-③ Expand carbon storage capacity in agricultural sector	Rural Development Administration	Ministry for Food, Agriculture, Forestry and Fisheries
2-4. Establish an early response system to climate change		
2-4-① Raise the surveillance system on climate change	Meteorological Agency, Ministry of Environment	-
2-4-② Produce climate change scenarios and develop predictive models of climate change	Meteorological Agency	-
2-5. Establish national food security system		
2-5-① Impact assessment and prediction on food production from climate change	Rural Development Administration	Meteorological Agency
2-5-② Raise climate-friendly basis of food production	Ministry for Food, Agriculture, Forestry and Fisheries, Rural Development Administration	-
2-5-③ Establish information system on major grain consumption and production	Rural Development Administration	Meteorological Agency
2-5-④ Expand international cooperation on resilient food supply	Rural Development Administration	Meteorological Agency, Ministry of Food, Agriculture, Forestry and Fisheries
2-6. Enhance identification of new projects on adaptation to climate change		
2-6-① Support policy development for identification and development of new business	Ministry of Knowledge Economy	Ministry of Environment, Ministry of Strategy and Finance, Meteorological Agency
2-6-② Foster industries on climate change and develop weather support map	Meteorological Agency	-
3. Promote social equity and public health		

action plan	Authority	Cooperating Authority
3-1. Promote economic activities in disadvantaged communities		
3-1-① Strengthening financial support for the disadvantaged communities	Ministry of Health and Welfare	Ministry of Knowledge Economy, Ministry of Strategy and Finance
3-1-② Expand the employment of the disadvantaged communities	Ministry of Employment and Labor	Ministry of Gender Equality and Family, Ministry of Health and Welfare
3-1-③ Enhance manpower utilization of the aged to prevent aging society	Ministry of Employment and Labor, Ministry of Health and Welfare	-
3-2. Improve the living conditions of vulnerable communities		
3-2-① Strengthen health services support system for vulnerable groups	Ministry of Health and Welfare	-
3-2-② Enhance the housing support for the vulnerable communities	Ministry of Land, Transport and Maritime Affairs	Ministry of Health and Welfare, Ministry of Strategy and Finance
3-2-③ Promote youth health care	Ministry of Health and Welfare, Ministry of Gender Equality and Family	Ministry of Education, Science and Technology, Ministry of Culture, Sports and Tourism
3-3. Building a community-based rural development		
3-3-① Stabilize management and income of farmers	Ministry for Food, Agriculture, Forestry and Fisheries, Rural Development Administration	-
3-3-② Expand basis on rural health and medicine	Ministry of Health and Welfare	local government
3-3-③ Expansion of basic rural infrastructure	Ministry for Food, Agriculture, Forestry and Fisheries, Ministry of Environment	Ministry of Land, Transport and Maritime Affairs, local government
3-3-④ Prepare basis of rural area	Ministry for Food,	Korea Forest Service

action plan	Authority	Cooperating Authority
development	Agriculture, Forestry and Fisheries	
3-3-⑤ Strengthen risk management of agricultural sector	Ministry for Food, Agriculture, Forestry and Fisheries	Ministry of Environment
3-4. Protect public life from changes in environment		
3-4-① Strengthen environment disease prevention and control	Ministry of Environment	Ministry of Health and Welfare
3-4-② Strengthen management of respiratory diseases from air pollution	Ministry of Environment	-
3-4-③ Advance safety management of hazardous chemicals and hazardous waste materials	Ministry of Environment	Ministry of Employment and Labor, Ministry of Knowledge Economy
3-5. Strengthen public health		
3-5-① Efficiency of public health care system	Ministry of Health and Welfare	-
3-5-② Expand essential Health Care Safety Network	Ministry of Health and Welfare	-
4. Improve sustainability of economic and industrial structure		
4-1. Compose resource recycling economy and society		
4-1-① National Integrated management system on resource recycling	Ministry of Environment, Ministry of Knowledge Economy	-
4-1-② Establish active basis of market-leading resource recycling	Ministry of Environment	-
4-1-③ Expand food waste reduction and promotion of recycling business	Ministry of Environment	Ministry for Food, Agriculture, Forestry and Fisheries, Ministry of Health and Welfare
4-2. Establish sustainable economic structure		
4-2-① Expand sustainable consumption system through active green consumption	Ministry of Environment	-

action plan	Authority	Cooperating Authority
4-2-② Expand sustainable production systems	Ministry of Environment, Ministry of Knowledge Economy	-
4-2-③ Sustainability management through the spread of industrial competitiveness	Ministry of Environment, Ministry of Knowledge Economy, Small and Medium Business Administration	Ministry of Employment and Labor
4-2-④ Low-carbon technology development and growth engine	All department	-
4-2-⑤ Promote development of environmental technology and industry	Ministry of Environment	Ministry of Knowledge Economy, Ministry of Education, Science and Technology, Ministry of Employment and Labor
4-3. Expand efficiency of energy use		
4-3-① Increase national energy independence	Ministry of Knowledge Economy	Ministry of Environment
4-3-② Building low energy consumption economic structure	Ministry of Knowledge Economy	Ministry of Land, Transport and Maritime Affairs
4-3-③ Advancement of energy technology development system	Ministry of Knowledge Economy	Ministry of Education, Science and Technology
4-4. Human resources and job creation		
4-4-① Expansion of advanced degree programs and experts development	Ministry of Education, Science and Technology	All department
4-4-② Leading expertise in human resources	Ministry of Education, Science and Technology	All department
4-4-③ Creation of green technology jobs	All department	-
4-4-④ Foster job creation through social enterprise	Ministry of Employment and Labor	All department

Appendix 2

List of action plan and Performance Indicators

Appendix 2 List of action plan and Performance Indicators

Action plan	Performance Indicator
1. Enhance Sustainability of Environment and Natural Resources	
1-1. Strengthen Integrity and Structure of Land and City	
1-1-① Strengthening the Integration of Land and Urban Management	Utilization of land management substantiality indicators (%)
1-1-② Establish Integration System on National Spatial Data	Rate of establishment of National Spatial Information Integration System (%)
1-1-③ Urban Expansion and Strengthen Networks of Ecological Space	Ecological restoration area (㎡), Per capita city park area (㎡)
1-2. Sustainable Forest Management	
1-2-① Valuable Forest Resource Development	Plantation area (Thousand ha), Planting forest Area (Thousand ha)
1-2-② Expanding Forests Services	Operating performance of healing forest, Results of forest composition
1-3. Sustainable Coastal Marine Environmental Management	
1-3-① Integrated Management System of Coastal and Marine Area	Records on coastal pollution management performance, Tidal Area (㎢)
1-3-② Create a Clean and Lively Coastal and Marine Environment	Coastal pollution (ppm)
1-3-③Maintain Coastal Biological Diversity	Status of biodiversity monitoring results by region, Create a list of marine organisms by biodiversity
1-3-④ Building a Sustainable Fishery Systems	Coastal fishery resource (thousand tons)
1-4. Enhance Soil Management Systems	
1-4-① Improve Soil Management Criteria and Strengthen Evaluation	Results of risk assessment and soil contamination
1-4-② Strengthen Preventive System of Soil Contamination	Soil contamination (including groundwater) Research support scores
1-4-③ Strengthen Soil Management in Vulnerable Areas	Improvement percentage (%) on contamination of soil, groundwater industrial areas

Action plan	Performance Indicator
1-4-④Technology and Industry Development of Soil Environment	Field test results from industries on technology development of soil and groundwater pollution prevention, practical performance on technology of soil and groundwater pollution prevention
1-5. Design Basis for Sustainable Wetland Management	
1-5-① Convert from Sporadical to Broad-based Wetland Management	Performance on river ecosystem and wetland restoration, Construction rate of DB on national wetlands information
1-5-② Introduction of Advanced Management System of Wetlands	Results of Ramsar registration
1-5-③ Prepare a Harmonized Basis for Conservation and Use of Wetlands	Number of participants in wetlands awareness expanding program
1-6 Secure Biodiversity	
1-6-① Ensure Diversity of Biological Resources	Number of national species
1-6-② Measures for Ecosystem Conservation in DMZ	Results of survey on ecosystem in DMZ members (including in DMZ)
1-6-③ Strengthen Protection of Endangered Plants and Animals	Results on endangered species restoration, Implementation on research of national distribution of endangered species (%)
1-6-④ Strengthen Management of Invasive Species that Alter Ecology	Survey and monitor species that disrupt ecosystem (%)
1-6-⑤ Risk Assessment of Genetically Modified Organisms to Ecosystem Mechanisms	Performance on risk assessment of genetically modified organisms in the natural ecosystem
1-7. Sustainable Water Resource Management	
1-7-① Establish Policies on Sustainable Management of Water	Ratio of good water on the standard BOD of 114 mid-scale watershed(%), Amount of polluted river water (BOD, ppm)
1-7-② Expand the Reliable Supply of Water Resources	Rural Water penetration (%), Rate of constructions of highly water treatment facilities (%)
1-7-③ Strengthening Sewage Treatment facilities and management	Penetration rate of sewer pipe (%), Penetration rate of sewer system in rural areas (%)

Action plan	Performance Indicator
1-7-④ Expand Development of Green Alternative Water and Water Reuse	Rate of reused sewage treated water (%)
1-7-⑤ Water Demand Management Mechanisms through Realization of Water Value	Reasonable rates of tap water (%), Water consumption per capita (ℓ/day)
1-8. Sustainable Prevention of Natural Disasters	
1-8-① Building National Disaster Response System	Life and property damages caused by natural disasters (average of recent five-year), Improved performance on repair
1-8-② Improve disaster recovery system to prevent repeated damage	Enhancement rate on disaster recovery management system (%)
1-8-③ Prevention of Climate Change Caused Disasters	Disaster prevention early contract rate (%) and early construction rate (%)
1-8-④ Stable Settlement of Consumer-driven Insurance on Flood Damage	Subscription rate of the flood damage insurance for housing and greenhouse (%)
1-9. Education and Public Relations for Sustainable Development	
1-9-① Establishment of Education Basis for Sustainable Development	Performance on development of education for sustainable development program
1-9-② Promote Publicity basis on Sustainable Development	Usage on Sustainable Development Information Network
1-10. Strengthen International Cooperation for Sustainable Development	
1-10-① Strengthening International Cooperation Network for Sustainable Development	Result on support sustainable development in developing countries
1-10-② Promote Expansion and Greening of ODA (Official Development Assistance)	ODA to GNI ratio (%)
2. Adaptation to Climate Change and Response Mechanisms	
2-1. Reduction of Greenhouse gas emissions by sector for carbon reduction	
2-1-① Promotion of Greenhouse Gas Emissions Reduction by Sectors	Rate on achieving the greenhouse gas reduction target of industrial sector (%)
2-1-② Promote Greenhouse Gas Emissions Reduction in the Building Sector	The rate of enhancing the insulation of windows and doors of buildings (%)

Action plan	Performance Indicator
2-1-③ Promote Greenhouse Gas Emissions Reduction in the Transport Sector	Share of metropolitan public transport (%), Green Car distribution
2-1-④ Promote Greenhouse Gas Emissions Reduction in the Waste Sector	Ratio of resources recovered to energy (%)
2-1-⑤ Promote Greenhouse Gas Emissions Reduction in the Food, Agriculture, Forestry and Fisheries Sector	Greenhouse gas emissions reduction rate in agriculture, forestry and fisheries sectors (%), Chemical fertilizers (N, K, P) usage (㎏ / ha)
2-2. Transparency of Carbon Emissions Source	
2-2-① Development and Management of Disclosure Indicator on Carbon	Index of companies responding to climate change
2-2-② Promote Active Disclosure of Carbon Information by Division and Targets	Number of carbon labeling certification items
2-2-③ Establish and Operate National Statistics on Greenhouse Gas Emissions	Performance on development and approval of Country-specific emissions and absorption.
2-3. Expand sustainable carbon sinks	
2-3-① Expand Forest Carbon Sinks	Forest carbon stocks (million tCO2)
2-3-② Develop Bio-circular Forest	Composition of bio-circular forest (10,000 ㏊), Development earnings of forest resources overseas (thousand ㏊)
2-3-③ Expand Carbon Storage Capacity in Agricultural Sector	Stocks increase of carbon in soil (%)
2-4. Establish an Early Response System to Climate Change	
2-4-① Raise the Surveillance System on Climate change	Rate on advancement of climate change predictions and monitoring capabilities (%)
2-4-② Produce Climate Change Scenarios and Develop Predictive Models of Climate Change	Results of climate change scenario development, Development rate on integrated earth system model (%)
2-5. Establish National Food Security System	
2-5-① Impact Assessment and Prediction on Food Production from Climate Change	Development rate of indicators and system on agricultural productivity and impact assessment (%)
2-5-② Raise Climate-friendly Basis of Food Production	Results on varieties and fish types adapted to climate change and disaster.

Action plan	Performance Indicator
2-5-③ Establish Information System on Major Grain Consumption and Production	Number of internationally established crop monitoring system
2-5-④ Expand International Cooperation on Resilient Food Supply	Performance on training developing countries' labour force in new agricultural technology, Cooperation result on international agricultural cooperation
2-6. Enhance Identification of New Projects on Adaptation to Climate hange	
2-6-① Support Policy Development for Identification and Development of New Business	Sales increase rate of new business on adaptation to climate change
2-6-② Foster Industries on Climate Change and Develop Weather Support Map	Utilization rate of weather map resources. (%), Growth in weather and climate industry (hundred million won)
3. Promote Social Equity and Public Health	
3-1. Promote Economic Activities in Disadvantaged Communities	
3-1-① Strengthening Financial Support for the Disadvantaged Communities	Installation number of the dream-start
3-1-② Expand the Employment of the Disadvantaged Communities	Number of employment for the vulnerable groups (ten thousand), Rate of female labor force participation (%)
3-1-③ Enhance Manpower Utilization of the Aged to Prevent Aging Society	Rate of elderly employment (%), Number of jobs seniors participate in
3-2. Improve the Living Conditions of Vulnerable Communities	
3-2-① Strengthen Health Services Support System for Vulnerable Groups	Number of government supported health care services
3-2-② Enhance the Housing Support for the Vulnerable Communities	Results in house distribution (thousands house)
3-2-③ Promote Youth Health Care	Satisfaction rate of adolescents about life, Euphoria rate of youth
3-3. Building a Community-based Rural Development	
3-3-① Stabilize Management and Income of Farmers	Farmers secure credit subscription rate (%), Agricultural support enterprise revenue growth (%)

Action plan	Performance Indicator
3-3-② Expand Basis on Rural Health and Medicine	Enforcement rate of adequate on-site first aid during emergency (%)
3-3-③ Expansion of Basic Rural Infrastructure	Rate of substandard rural housing renovation (%)
3-3-④ Prepare Basis of Rural Area Development	Areas residents satisfaction rate (%), Key leader training (people)
3-3-⑤ Strengthen Risk Management of Agricultural Sector	Rising rate in supply item of diagnosis of disease in prevention. (%)
3-4. Protect Public Life from Changes in Environment	
3-4-① Strengthen Environment Disease Prevention and Control	Rate of health impact of metal mining waste to residents (%) Assessment on hazardous materials of Children's Goods ratio (%)
3-4-② Strengthen Management of Respiratory Diseases from Air Pollution	Particulate matter early warning ratio (%)
3-4-③ Advance Safety Management of Hazardous Chemicals and Hazardous Waste Materials	Emissions rate according to business volume on chemical substances reduction (%)
3-5. Strengthen Public Health	
3-5-① Efficiency of Public Health Care System	Ratio on public sources from medical expenses (%), Annual number of completed professional medical centers (operating)
3-5-② Essential Health Care Safety Network	Number of support (solution) on essential health care sector such as emergency, delivery, etc.
4. Improve Sustainability of Economic and industrial structure	
4-1. Compose Resource Recycling Economy and Society	
4-1-① National Integrated Management System on Resource Recycling	Construction ratio of recycling information system (%)
4-1-② Establish Active Basis of Market-leading Resource Recycling	Ratio of waste recycling (%)
4-1-③ Expand Food Waste Reduction and Promotion of Recycling Business	National Awareness on Food Waste Reduction, Reduction rate of food waste (%)

Action plan	Performance Indicator
4-2. Establish Sustainable Economic Structure	
4-2-① Expand Sustainable Consumption System through Active Green Consumption	Number of green retail store, Government Green Product Purchases rate
4-2-② Expand Sustainable Production system	Number of companies with environmental management , Number of product quality certification on recycled product
4-2-③ Sustainability Management through the Spread of Industrial Competitiveness	Number of companies issuing reports on sustainable management
4-2-④ Low-carbon Technology Development and Growth Engine	Investment scale on low carbon technology development (hundred million KRW)
4-2-⑤ Promote Development of Environmental Technology and Industry	Environmental Industry Sales Growth rate (%), Environmental Industry Exports (trillion won)
4-3. Expand Efficiency of Energy Use	
4-3-① Increase National Energy Independence	Share of renewable energy supply (%)
4-3-② Building Low Energy Consumption Economic Structure	Energy unit (TOE/$thousand, based on PPP of 2000), Energy efficient equipment results dissemination (%)
4-3-③ Advancement of Energy Technology Development System	Public sector investment on energy technology development (hundred million won)
4-4. Human Resources and Job Creation	
4-4-① Expansion of Advanced Degree Programs and Experts Development	Satisfaction level of expert nurturing process (%)
4-4-② Leading Expertise in Human Resources	Green Technology and Industry research manpower (10 thousand)
4-4-③ Creation of Green Technology Jobs	R&D expenditure rate for GDP (%)
4-4-④ Foster Job Creation through Social Enterprise	Number of social enterprise authentication (accumulated)

Appendix 3

Sustainable Development Indicators (SDI)

Ⅰ. Background and Progress

□ Background

○ In order to present the direction towards sustainable development, 77 national sustainable development indicators within three sectors of society, environment and economy were selected in 2006 October.

- As indicators that assess the level of national sustainable development, SDIs will be a secure data of evidence on national strategies on sustainable development.
- It proposes future plans on the assessment results of national sustainable development implementation plans.

□ Progress

○ 2000 : Research on Environmental Performance Indicator and 'National statistics development direction followed by development of sustainable development indicator OECD' (Ministry of Environment)

○ 2002~2005 : International community realizes the need to nationally manage the assessment result of ESI at World Economic Forum (Korea 136th/122th).

○ 2006 : Establishment of assessment measure on national sustainability (the 4th National Commission on Sustainable Development)

- Designated 77 indicators after extensive discussion among experts, stakeholders and government departments of every sector.

○ 2009 : Assessment of SDIs (the 5th National Commission on Sustainable Development)

○ 2011 : Change some parts of SDIs (the 6th National Commission on Sustainable Development)

Ⅱ. 2011 Sustainable Development Indicators (SDI)

□ Composition

○ Within 3 sectors of Economy, Society and Environment; there are 14 themes, 34 sub-themes and total of 77 indicators.

○ Three sectors

- Society : 6 themes, 12 sub-themes, 25 indicators

Theme	Equity			Health					Educat-ion	Housing	Disaster /Security	Populat-ion
Sub-theme	Poverty	Labor	Gender equality	Nutritional status	Mortality rate	Life expect-ancy	Drinking water	Health care delivery	Educat-ion level	Living condit-ions	Crime /disaster	Populat-ion change
Indi-cators	3	2	2	1	1	1	1	3	3	3	2	3

- Environment : 5 Theme, 11 Sub-theme, 27 Indicators

Theme	Atmosphere			Land			Oceans /coasts		Fresh Water		Biodiversity
Sub-theme	Climate change	Ozone layer	Air quality	Agriculture	Forests	Urbaniz ation	Coastal zone	Fisheries	Water quantity	Water quality	Ecosystem
Indi-cators	3	1	1	5	3	2	3	2	2	2	3

- Economy : 3 Theme, 11 Sub-theme, 25 Indicators

Theme	Economic structure				Consumption /production				Information Society		
Sub-theme	Economic perform-ance	Trade	Financial status	ODA	Material consum-ption	Energy use	Waste manage-ment	Transp ortation	Access to inform-ation	Information infrastructure	Sciences and technology
Indi-cators	5	1	2	1	1	4	4	3	2	1	1

□ Correlation with International indicators

Sector	Theme	Sub-theme	Indicator	Remarks	
				UN	OECD
Social	1.Equity	1-1.Poverty	01) Percent of population living below the poverty line	○	
			02) Gini Index of income inequality	○	
			03) Unemployment rate	○	○
		1-2.Labour	04) Average working hours		○
			05) Wage ratio of regular to non-regular work		○
		1-3.Gender equality	06) Ratio of female to male wages	○	
			07) Percent of women's economic participation		○
	2.Health	2-1.Nutritional status	08) Nutritional status of children	○	
		2-2.Mortality rate	09) Mortality rate under one years old	○	○
		2-3.Life expectancy	10) Average life expectancy	○	○
		2-4.Drinking water	11) Supply rate of water service in farming and fishing villages	○	
		2-5.Health care delivery	12) Public revenue to national health expenditure ratio		○
			13) National health & welfare expenditure		○
			14) Percent of children vaccinated against infectious diseases	○	
	3.Education	3-1.Education level	15) Net percent of children graduating from middle school	○	
			16) Number of students per class in elementary schools		○
			17) Education expenditure (cost of public and private education)		○
	4.Housing	4-1.Living conditions	18) No. of houses below the minimum housing conditions	○	
			19) Number of houses per 1000 population		○
			20) Comparison of house price against income		
	5.Disaster/ Security	5-1. Crime /Disaster	21) Number of recorded crimes per 1000 population	○	
			22) Damages from natural disasters	○	
	6.Population	6-1.Population change	23) Population growth rate	○	○
			24) Population density (number of people/㎢)		
			25) Percent of aged population		○

Sector	Theme	Sub-theme	Indicator	Remarks	
				UN	OECD
Environmental	1. Atmosphere	1-1.Climate change	26) Green house gas emissions	○	
			27) Green house gas emissions per capita	○	○
			28) Green house gas emissions per GDP		○
		1-2.Ozone layer	29) Consumption of ozone depleting substances	○	
		1-3.Air quality	30) Air pollution in metropolitan cities	○	
	2.Land	2-1.Agriculture	31) Percent of farmland area	○	
			32) Production ratio of environmental-friendly Agricultural products of the quality- certificated		
			33) self-sufficiency rate of food	○	○
			34) Use of fertilizers (N, P, K)	○	○
			35) Use of agricultural pesticides	○	○
		2-2.Forests	36) Forests area as a percent of land area	○	
			37) Park area per capita within a city	○	
			38) Wood harvesting intensity	○	
		2-3. Urbanization	39) Urbanization rate	○	
			40) Concentration rate of population in Seoul Metropolitan area		
	3.Oceans/ Coasts	3-1.Coastal zone	41) Coastal pollution	○	
			42) Amount of ocean dumping		
			43) Size and rate of increase and decrease of foreshore area		
		3-2.Fisheries	44) Amount of marine resources	○	
			45) Amount of fishery farming		○
	4.Fresh water	4-1.Water quantity	46) Annual withdrawal of ground and surface water	○	
			47) Amount of water consumption per capita per day		○
		4-2.Water quality	48) Water pollution in four major rivers	○	
			49) Sewage distribution rate		○
	5. Biodiversity	5-1. Ecosystem	50) Protected area as a % of total area	○	○
			51) Number of national species	○	○
			52) Number of species in danger of extinction		○

Sector	Theme	Sub-theme	Indicator	Remarks	
				UN	OECD
Economy	1.Economic structure	1-1.Economic performance	53) GDP	○	○
			54) GDP per capita	○	○
			55) Economic (real GDP) growth rate	○	○
			56) Net investment share in GDP	○	
			57) Consumer price index		○
		1-2.Trade	58) Balance of trade in goods & services	○	
		1-3.Financial status	59) Ratio of taxation per capita		○
			60) Debt to GDP ratio	○	
		1-4.ODA	61) ODA to GNI ratio	○	○
	2.Consumption / Production	2-1.Material consumption	62) Intensity of material use	○	
		2-2. Energy use	63) Annual energy consumption per capita	○	○
			64) Total energy supply		○
			65) Share of renewable energy supply	○	○
			66) Energy unit	○	○
		2-3.Waste management	67) Generation of industrial and municipal solid waste	○	○
			68) Generation of hazardous waste	○	○
			69) Generation of radioactive waste	○	○
			70) Rate of Waste recycling and reusing	○	○
		2-4. Transportation	71) Transportation shares of public transport mode	○	○
			72) Total length of roads and cycling paths		○
			73) No. of car accidents		○
	3.Information Society	3-1.Access to information	74) No. of high-speed internet subscribers	○	
			75) Ratio of households with PCs		○
		3-2.Information infrastructures	76) No. of online civil application services		
		3-3.Sciences and technology	77) Expenditure on R&D as a percent of GDP	○	○

2011-2015

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Green-Press Eco-Product

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