

# Korea Environmental Policy Bulletin

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## Environmental Health Plan 2006~2015

### I. Background

It is reportedly known that the quality of life has been improving in recent years, but a public health crisis due to environmental pollution increases as well every year. Since the arrival of new millenium in 2000, environmental pollution becomes more serious as its impact on public health increases year by year. The habitants of industrial complexes and abandoned mines are appealing health damages, and concerns for diseases due to environmental agent such as atopic dermatitis and asthma are spreading seriously. All these are attributable to the increase of the use of chemicals in daily lives, rise of expectation of the people for the quality of environment, as well as diversification of the causes of environmental pollution. The environmental health issue now becomes intense societal concern.

Korean environmental policy, much centered on the management of the environmental media, carries fundamental limitation to solve these problems. The Ministry of Environment is more focused on the physical environment preservation, environmental pollution prevention, and environmental improvement. However, although an ultimate goal of environmental pollution prevention is to protect public health and ecosystem, it seems that environmental media-oriented policy has been neglecting its impact on public health.

Fundamental changes in paradigm is, therefore, required to establish the environmental policy of the 21st century. A demand to switch into receptors-oriented policy is higher than ever in order to realize

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'the constitutional human right to enjoy comfortable and healthy life', which values both public and ecosystem health. Furthermore, media-integrated environmental policy based on the precautionary principle is required because environmental pollution causes fatal and

irreversible damages. As a result, a 10-year plan to improve environmental health has been devised to meet the need of mid and long-term plan to transform the current media-oriented environment policy into environmental health-oriented one that cares public health.

## II. Objective and Strategies

The objective of this plan is to minimize threats to public health originated from environmental pollution and to realize healthy and sound society free from threats of diseases caused by environmental pollution. It would be more clear to state that the plan aims to reduce a level of population at risk to half of the present level within 10 years, and to establish a management system that monitors and alarms the outbreak of environmental pollution related diseases.

The principles of the plan are classified to 4 categories;

1) Precautionary principle: Preventive policy shall be carried out under the presumption that certain environmental pollutions are harmful until they are proven otherwise due to the irreversibility and fatality of environmental pollutions.

2) Receptors-oriented principle: Public health and ecosystem safety, keeping in mind that the ultimate consumers of environment policy are the human beings, should be a priority in implementing integrated management policy for environmental pollutant.

3) The vulnerable and sensitive population protection principle: The environmental health justice shall be realized taking consideration of the vulnerable and sensitive classes such as infants, child-caring women and the aged.

4) Principle of participation and right to know: Risk communication system shall be established to

allow easy access to available data and information on hazardous chemicals and environmental health. A system to promote the participation and evaluation of public and stakeholders is required as well .

The enforcement strategies of the Environmental Health Plan are as follows;

1) Integrated coordination of existing environmental management plan and policy: The environmental health plan is to suggest priority, standards, guidelines for setting environmental policy.

2) Minimization of uncertainty through the scientific examination system: The plan shall provide a basis to public and civil research system, and construct scientific examination system through interdisciplinary cooperation between environmental and health science.

3) Preventive disease management through the prediction and monitoring on risk to human or ecosystem: The plan shall construct early detection and prevention system by establishing system estimating impact on human being and surveiling occurrence of disease continuously, and by broad environment monitoring and hazard assessment.

4) Inducement of stakeholder participation in carrying out the Plan: The Plan shall promote participation of various stakeholder such as NGOs, industries, public, etc. in carrying out policy through active risk communication.

5) Construction of global or regional cooperative network: The Plan shall encourage positive participation in the international programs and discussions provided by WHO, UNEP, etc. and actively develop and carry out intergovernmental or regional cooperative programs for environmental health with Asian countries including China, Japan, North Korea, and Mongolia.

6) Efficient enhancement of policy through the burden of disease as well as health cost-benefit analysis: The plan shall quantify social cost of various diseases caused by environmental pollution and decide priorities in policy decision making and preventive policy establishment using the result of cost analysis.

To realize the initial visions and goals of the plan based upon the above principles and strategies, the government shall develop and carry out essential specific projects for each field, selecting 3 strategic projects which reflect the precautionary principle. Three strategic projects consists of 1) minimization of population at risk by environmental pollution, 2) prevention of diseases caused by environmental pollution, 3) construction of infrastructure of environmental health. Once the goal of minimizing the population at risk and the occurrence of environmental pollution-originated diseases are achieved, thanks to such comprehensive infrastructure of environmental health policy, Korea can expect to join the developed countries in the field of environmental health.

### III. Action Plan and Projects

Three major strategic projects are selected in order to achieve the goal of 10-Year Plan of Environmental Health, and core projects in each project field are developed for effective implementation.

- Strategy for Reduction of Exposure to the Risk Factors such as pollution, and Population at Risk : 56 projects
- Strategy for the Investigation, Monitoring, and Management of Environmental Disease : 38 projects

-Strategy for Constructing Infrastructure of Environmental Health : 62 projects

The major projects of each enforcement strategy are as follows:

#### 1. Strategy for Reduction of Exposure to the Risk Factors, and Population at Risk<sup>1)</sup>

<sup>1</sup> Population at risk refers to a group of people who are directly exposed to environmental pollution that is sometimes beyond the level of an environmental standard. Taking the example of PM10 in the nation, population at risk, who is exposed to over the air pollution standard of 70 $\mu\text{g}/\text{m}^3$ , is estimated up to 20% of the entire population

## OBJECTIVE

Minimization of population at risk by environmental pollution

## PROSPECT and STRATEGIES

### PROSPECT

- Continuous increase of air and water pollutants
- Increase of emerging environmental risk factors
- Increase of health risk as chemical products grow larger

### STRATEGIES

- Exposure monitoring and risk assessment of environmental media
- Population risk assessment
- Strategy development for population at risk decrease
- Reflection of pollution management policy of environmental media

## MAJOR PROJECTS

### Outdoor / indoor air

- Long/short term monitoring of exposure to hazardous air contaminants
- Estimation of population at risk by outdoor and indoor air pollution
- Development of the standards of outdoor and indoor air quality based on exposure and risk assessment

### Water / drinking water / soils

- Long/short term monitoring of pathogenic microbe
- Estimation of population at risk by polluted drinking water and establish reduction strategy
- Strengthening of drinking water standard and management system for health protection

### Chemicals and chemical products

- Exposure assessment of hazardous chemicals and estimation of population at risk
- Risk assessment of hazardous chemicals and establishment of the management system
- Reinforcement of health protection system (e.g. limited handling of chemicals, etc.)
- Provision of management system for hazardous chemical products

### Daily lives

- Exposure assessment of hazardous factors in daily lives( e.g. noise, electromagnetic waves, etc.)
- Estimation of population at risk by hazardous factors in daily lives and establishment of the reduction strategy
- Establishment of the standards of hazardous factors in daily lives and development of the reduction strategy

### Emerging environmental areas

- Risk reduction due to the new engineering technology (e.g. Nano-tech, biotech, etc.)
- Health impact assessment (HIA) for emerging environmental factors (e.g. global warming, etc.)
- Development of management system of emerging environmental factors

Recent researches prove that pollution is a major contribution to the cause of children asthma, atopic dermatitis. For drinking water, it is acknowledged that the release of hazardous material and antibiotic worsens the water quality. Also, cases of people who suffer from hazardous chemicals (such as endocrine disruptors, POPs, biocides) are reported. The public distrust on products containing chemicals spreads nationwide. Thus, the concerned strategy requires to set the aim in following directions.

### 1.1 Purpose

- The degree and propensity of risks to the people's health by various environmental factors shall be monitored and followed by administration policy proposal.
- The Plan shall estimate the affected population by environmental pollution. It should also carry out preliminary survey to reduce the number of population by more than 50%, and establish a management strategy.
- The degree of pollution, of risk, and the cause of risk regarding the factors such as air, indoor air, water, drinking water, and hazardous chemicals shall be assessed. The goals and standards of health protection should be prepared based on the risk of each factor.
- A list of risk factors like hazardous chemical containing products as well as high risk of exposure of electromagnetic waves and noises shall be monitored and evaluated.
- The new environmental challenges such as climatic change, nano-products, and endocrine disrupters shall be managed by monitoring and evaluation of their risk
- Measures to reduce harms of vulnerable area such as industrial complexes, abandoned mines, and landfill site shall be set up and executed by clarifying their impact on health through long-term monitoring and epidemic research against the same regions, ultimately to reduce population at risk of the same area.

### 1.2 Projects

#### 1) Exposure Reduction to Outdoor/Indoor Air Pollution

- Monitoring of exposure to pollution of outdoor and indoor air and assessment of its impact on health
- Estimation of population at risk by outdoor and indoor air pollution and development of reduction strategies
- Monitoring of exposure to VOCs(Volatile Organic Compounds) of human body
- Measures to reduce impact of dust and sandstorm(yellow dust) on human health

#### 2) Exposure Reduction to the Water Pollution

- Monitoring of exposure to the water/drink water pollution and assessment of its impact on human health
- Estimation of population at risk by water/drinking water pollution and establishment of strategies to reduce it
- Management of pathogenic microbe related to the water pollution
- Investigation of actual conditions of residue of medical supplies such as antibiotics in the environment and its impact on human health

#### 3) Risk Assessment and Management of Chemicals and Chemical Products

- Risk Assessment of Chemicals and estimation of population at Risk
- Health protection against the chemical products
- Development of monitoring system on Human health and eco-system impact

#### 4) Reduction of Health Impact of Hazardous Factors in Daily Lives

- Estimation of population by exposure to the noises and development of reduction plan to health impact
- Investigation and research on the exposure to the electromagnetic waves and health impact

5) Health Protection from Emerging Environmental Factors

- Analysis and prediction of health impact driven by climate change
- Assessment of health impact of nano PM

- Investigation of health impact in the abandoned mining region and reduction of population at risk
- Investigation of health impact in the industrial complexes and reduction of population at risk

6) Investigation of Health Impact in the Vulnerable Region and Reduction of Population at Risk

## 2. Strategy for the Investigation, Monitoring, and Management of Environmental Diseases

### OBJECTIVE

Precautionary system development of environmental diseases and preparation of management measures of environmental diseases

### PROSPECT and STRATEGIES

#### PROSPECT

- Diversification of outbreak patterns of environmental diseases
- Increase of diseases burden due to the increased pollution level
- Increase of hazardous impacts on sensitive/vulnerable group

#### STRATEGIES

- Clarification of environmental diseases based on systematic investigation
- Early warning system development based on disease monitoring system
- Provision of management strategy (e.g. supporting victims of environmental diseases, etc.)

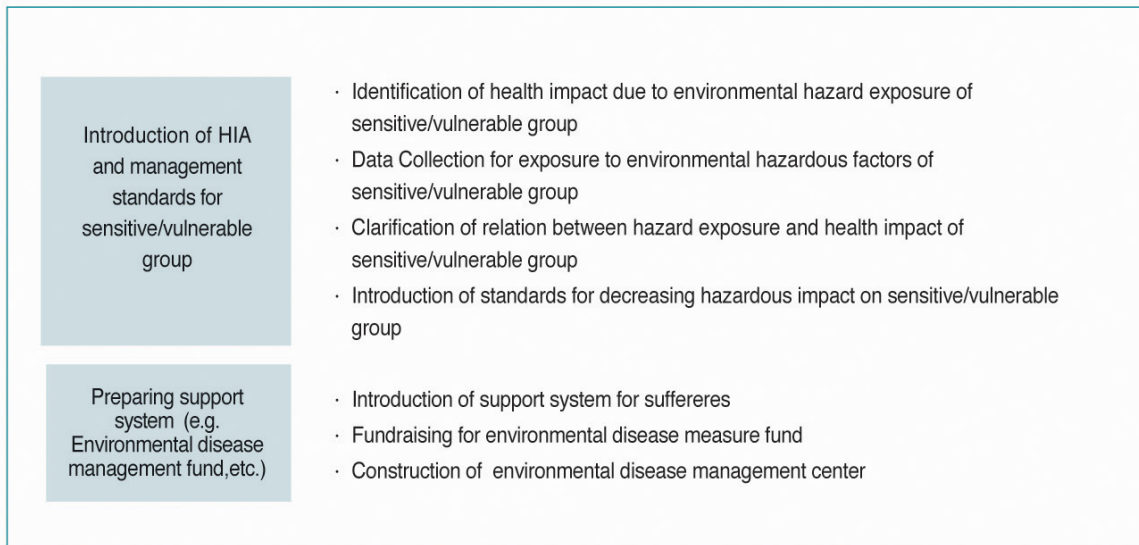
### MAJOR PROJECTS

Identification of outbreak patterns/type of environmental diseases

- Identification of environmental disease outbreak by media/region/group
- Construction of assessment information center about environmental disease outbreak
- Clarification and identification of causes of environmental diseases

Adoption of monitoring system for environmental diseases

- Enactment of combined monitoring system for environmental pollution and disease outbreak
- Analyzing connection between diseases and exposure factors
- Preparation of measures for environmental disease decrease by media/region/group



Domestic environmental policy is transformed from pollutant-based Environmental media management into receptor-based integrated and precautionary management. The new policy requires some background. Studies have neglected the vulnerable and sensitive population (pregnant, children, the elderly, etc.). The demand for studies in this area is aggrandizing. In addition, the cause of environmental diseases in industrial complex mines and big cities has not been sufficiently identified. For that, following projects are proposed.

### 2.1 Purposes

- Measures to protect sensitive groups such as aged persons, pregnant women and the low-income bracket shall be established before everything in order to prevent risk due to the environmental pollution and to establish management system of it.
- Monitoring systems for diseases due to environmental pollution shall be constructed, as well as those for the exposure of affecting hazardous chemicals.
- Clarification of causes and preparation of

countermeasures shall be done through systematic investigation, because it is difficult to clarify the cause of environmental diseases.

- Measures to aid victims of environmental diseases and support system shall be prepared.

### 2.2 Projects

#### 1) Monitoring System for Environmental Diseases

- Monitoring of pollution by heavy metals and POPs in the blood and urine
- Monitoring system for asthma due to air pollution
- Monitoring system for birth rate due to air pollution
- Monitoring system for cancer due to environmental pollution
- Monitoring system for lung cancer due to the exposure to the PM10 and PAH (Polycyclic Aromatic Hydrocarbon)
- Monitoring system for the exposure to the pesticides and health impact
- Monitoring system for breast cancer due to the environmental pollution (Bisphenol A and PAH)

- Investigation and estimation of the scale of occurrence of major environmental diseases

## 2) Investigation of Health Impact on Sensitive Group

- Exposure to the electromagnetism and electrolytic radiation and investigation of health impact such as children's cancer
- Assessment of VOCs' harmful impact on the nervous system of the children and the aged population
- Investigation of correlation between the exposure to heavy metal and immunity disorder/nerve development disorder of children
- Investigation of correlation between environmental pollution and children's asthma/atopic dermatitis
- Investigation of impact of exposure of pregnant women to chemicals on unborn children

- Investigation of impact of indoor air pollution on pregnant women
- Development and operation of environment and health education programs for children

## 3) Health Impact on Vulnerable Class

- Assessment of environmental health of the aged population and socially vulnerable group

## 4) Examination of Environmental Diseases and Preparation of Support System for Sufferers

- Examination of environmental diseases and preparation of support system for sufferers

# 3. Strategy for Constructing Infrastructure of Environmental Health

### OBJECTIVE

Constructing infrastructure for environmental health policy and establishing investigation/research infra-technology

### PROSPECT and STRATEGIES

#### PROSPECT

- Increased legal and institutional demands for environmental diseases
- Rapid increase of demands on environmental health research and policy
- Needs of infra-technology for policy and research

#### STRATEGIES

- Law/institution/organization improvement for environmental health
- Development of infra-technology for environmental health management
- Enhancement of public information about education/public relation/international cooperation



## MAJOR PROJECTS

Constructing administrative-infra for environmental health policy

- Legal-infra improvement (e.g. Environmental Health Promotion Act, etc.)
- Enhancement of research-infra (e.g. Environmental Health Institute, specified center)
- Reinforcement of administrative organization and manpower

Constructing political-infra for environmental health policy

- Introduction of HIA for establishing preventive system
- Assessment system development of environmental diseases burden and construction of related information
- Development and applicable method introduction of health cost-benefit analysis
- Construction of network among the ministries and offices

Environmental health education/public relation

- Special training for environmental health
- Establishment of environmental health risk communication system
- Introduction of method to activate environmental health education

Developing infra-technology for environmental health management

- Development of management system of environmental health information
- Assessment system construction for toxic information of pollutants
- Development of environmental health indices
- Estimation of individual exposure amount and development of HIA tools

It should be noted that an integrated system for receptor-oriented environmental health policy has to be established in various aspects. For that, present regulation and system are required to be maintained. At the same time, the expansion of professional pool and administrative system should be accompanied. An appropriate method for newly adopted system like Health Impact Assessment, (HIA) Burdens of Disease Analysis, Health Cost-Benefit Analysis should also be prepared. Following projects are suggested to realize this mission.

### 3.1 Purpose

- Legal and institutional infrastructure shall be constructed and exclusive organization shall be set up, so that environmental health policy shall be stably pursued.

- HIA shall be introduced to prevent people's health damages from development projects.

- Basic technologies such as measuring technology, impact assessment methods, and counter-technology shall be developed, all of which are related to the environmental health.

- Special training programs shall be operated to raise experts, system for civil education and publicity shall be constructed as well as network of specialists on environmental health.

### 3.2 Projects

- 1) Construction of Institutional Infrastructure for Environmental Health
  - Overhaul of laws, ordinances, and standards related to the environmental health

- Expansion of basis for environmental health research
- Expansion of administrative organization and manpower for environmental health affairs

#### 2) Construction of Infrastructure for Environmental Health Policy

- Introduction of HIA
- Introduction of Environmental health cost-benefit analysis

#### 3) Education, Public Relation, and International Cooperation

- Construction of network among specialists on environmental health
- Construction of interactive risk communication system for environmental health
- Reinforcement of international cooperation in the field of environmental health

## IV. Organization and Finances

10-year plan for the improvement of environmental health consists of 6 enforcement strategies and 156 specific projects, and each enforcement strategy shall be executed along with the most fitted system for it.

The assessment of health impact, and region- and media-wise population at risk should be assessed through various media, chemicals and vulnerable regions during the first 3 years. After this period, when data of estimated population at risk are produced and accumulated, analysis on dangerous factors to set up measures to reduce population at risk to the level of below 50% of present status should be generated. Furthermore, the regulation system such as restriction on use entered into full scale enforcement from 2006. Cooperative system such as voluntary agreement with manufacturers shall be constructed through the assessment of actual condition of hazardous chemical containing product.

In the initial stage, relevant data shall be produced, collected, and evaluated as a groundwork for the construction of monitoring system of environmental diseases. In line with the strategy of investigation, prevention, and administration of environmental diseases, and, for the sake of effective monitoring of environmental diseases, monitoring of exposure to human body shall be accompanied as well,

through the living body indicators derived from the blood heavy metal density assessment project against general public. In addition to that, nationwide monitoring system for environmental diseases of diverse origination will be developed, established, and operated in 2010. During its first 5 years, basic investigation on the impact on the health of children, pregnant women, aged people, and socially vulnerable class shall be conducted. From 2010 and on, environmental health service project for socially vulnerable class shall be developed and operated. As well, it is expected that exclusive organization will be established by 2008 to support setting up countermeasures against the health damages, confirming of damages attributable to the health impact, preventing damages, and supporting sufferers.

As to the construction of basis for the administration of environmental health, 'Environmental Health Promotion Act'(tentative name) is under development to be completed by 2007 and enforced on after 2008. Until the same year, pertinent organization and manpower shall be reinforced within the Ministry of Environment. In each local government, Environmental Health Center shall be established to carry out exclusive mission of research, and 5~10 base hospitals per each wide administrative district shall be

designated and operated as local Environmental Health Center. Until 2008, environmental health policy and institutional basis shall be prepared by establishing HIA system and system to evaluate environmental and economic effect of environmental health policy, etc. which shall enter into full scale enforcement stage after passing through trial operation period of 2009~2011. To assume research projects such as development of basic technologies, policies, and systems related to the environmental health policy, 'Environmental Health Policy Task Force'(tentative name) will be constituted in 2007. The task force shall execute basic research project(1st stage project) in 2008~2009, in-depth research project(2nd stage project) in 2010~2012, and applied research project(3rd stage project) in 2013~2015.

During the project period of 10years (2006~2015), the plan requires 776 million dollar to execute 3 major strategies and 156 detailed projects. In breaking up, 122 million dollar will be spent to conduct health impact assessment of environmental pollution and to formulate and execute reduction strategy for population at risk, 64 million dollar for investigating/clarifying environmental diseases and constructing

monitoring system for the diseases, 388 million dollar for supporting sufferers from environmental damages and carrying out preventive measures, 138 million dollar for establishing Environmental Health Center and promoting local environmental health centers, and 64 million dollar for developing basic technologies such as environmental health management technology and policy technology.

The estimated budgets for each stage of Environmental Health Plan are as follows: 90 million dollar for initial 3 years(2006~2008), 150 million dollar for next 3 years(2009~2011), and 540 million dollar for last 4 years(2012~2015).

The fund shall be raised by setting up and levying 'toxic chemicals charge' and establishing environmental disease prevention fund. It is proposed that 0.36 cent per 1kg of 'toxic chemicals charge' shall be levied from those who produce or import any of approximately 550 toxic chemicals among total chemicals in line with polluters pay principle. Thus, while suppressing the use of toxic chemicals, 82 million dollar of charge shall be levied annually to meet the budget for environmental health promotion fund.

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