Past 30 Years and Future 30 Years

National Institute of Environmental Research

Present by Director Donggon Hong

Contents

I ▷ Past 30 Years

1. Traces of NIER

2. Historical Photos

3. Research Focus until Now

1. Traces of NIER

July 1978
- Established as the National Environmental Protection Institute (NEPI) under the Ministry of Health and Social Affairs

Jan. 1980
- NEPI was incorporated into Environmental Administration

Oct. 1986
- NEPI was reorganized the National Institute of Environmental Research (NIER) (3 departments, 2 divisions and 14 offices)

July 2000
- Moved to Environmental Research Complex at Incheon

July 2005
- Reorganized focusing on research functions covering an Environmental Medias

March 2007
- Created Environmental Health Research Department
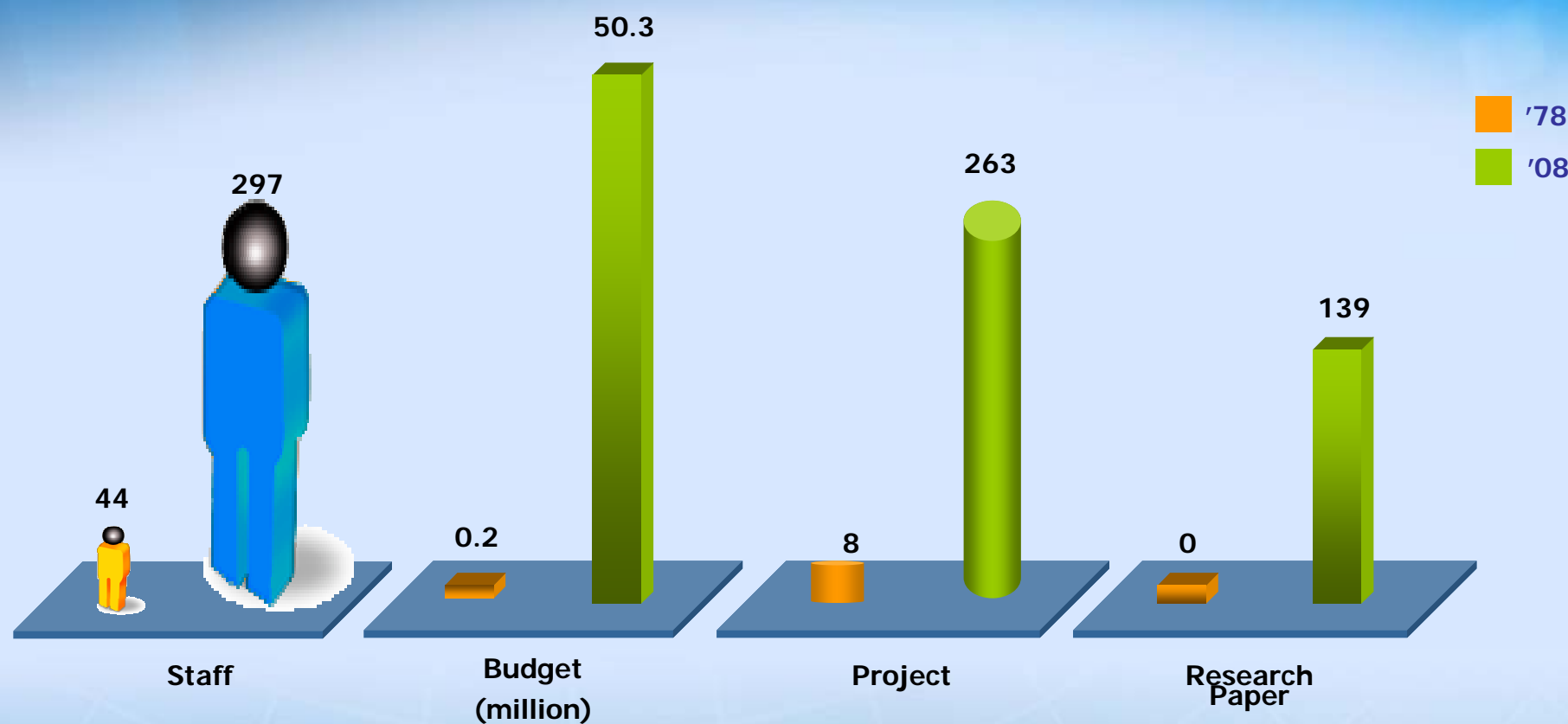- 6 departments, 24 divisions and 6 centers)

June 2008
- Held the celebration of 30th Anniversary of NIER

Building

In 2008

2. Historical Photos

Phase 1 (1978~1989)

Phase 3 (2000~Present)

Ceremony for the completion of building

Tripartite Presidents Meeting

CRAES Training Program

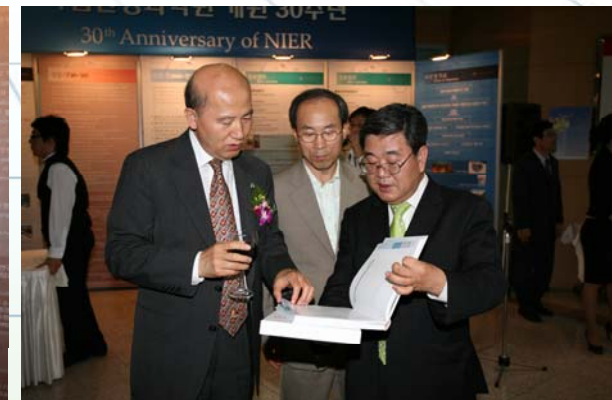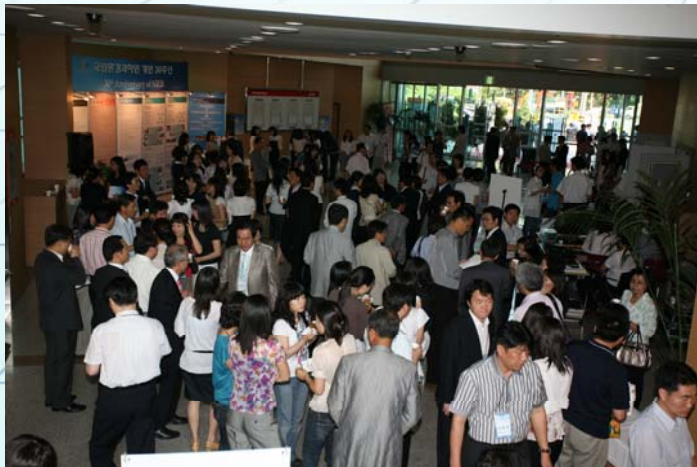MOU between NIER and IM, Japan

MOU between NIER and EU JRC

30th Anniversary Celebration

Phase 1

[1978~1989]

- Analyze the air and water quality and response to environmental pollution accidents

Phase 2

1990~1999]

- Investigate the pollutants of each environmental media

- Study enactment of environmental standard and analytical method

Phase 3

[2000~Present]

- Evaluate the environment quality focusing on receptors covering environmental medias
- Carry out Practical study for improvement of living environment such as environmental health and ecosystem

Environmental Risk Research

🔵 **Environmental Health Research**

 - **Study on environment pollution exposure level and health effect**

   · **Cohort of residents of industrial areas**

 - **Study on mercury exposure level and route**

   · **Test blood and urine samples of sensitive group**

🔵 **Environmental Risk Assessment**
   - Operation of Ecological Toxicology Lab
   - Endocrine Disruptors Project and Training

🔵 **Construction & Operation of CARIS**
   - Field response information and the guideline for each type
   of incident
   - Provide chemical terror response training for fire officers,
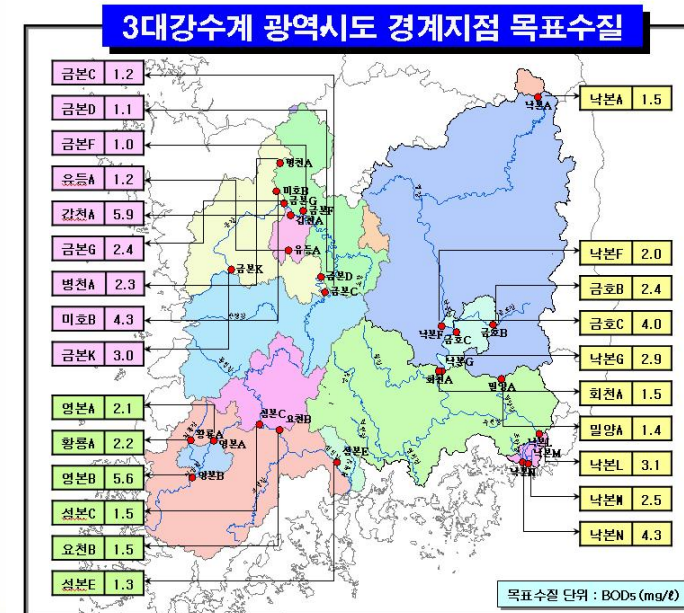   police officers and military forces

Water Environment

Improvement of Water Quality Standards
- Adjust water quality standard, which has operated for 28 years
  · Add new biological standard such as fish
  · Advance standard of stream (Grade 5→Grade 7)

I grade ~ V grade

I a   I b   II   III   IV   V   VI
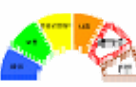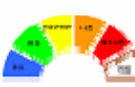
Target Water Quality of TMDL
- Established Target Water Quality for 25 site
- Establish the 2nd TMDL System
- Technical Support for Local Government

Response for Water Pollution Accidents
- Phenol('91), Dichloromethane('94) in Nakdonggang
- 1.4 Dioxan Detection('04)
- Virus Detection in Drinking Water('99~'0)

3대강수계 광역시도 경계지점 목표수질

금본C	1.2	
금본D	1.1	
금본F	1.0	
유등A	1.2	
갑천A	5.9	
금본G	2.4	
병천A	2.3	
미호B	4.3	
금본K	3.0	
영본A	2.1	
황룡A	2.2	
영본B	5.6	
섬본C	1.5	
요천B	1.5	
섬본E	1.3	

낙본A	1.5
낙본F	2.0
금호B	2.4
금호C	4.0
낙본G	2.9
회천A	1.5
밀양A	1.4
낙본L	3.1
낙본N	2.5
낙본N	4.3

목표수질 단위 : BODs(mg/ℓ)

Air Quality

- **Development of Comprehensive Air Quality Index**
  - **6 Step (from 0 point ~500 points)**

- **Ozone Forecasting System [1988 Seoul Olympic)**
  - **Operation in Local government**

- **Suggest 'recommendation about air quality of new buildings'** (September 2005)
  - Investigate indoor air quality of new buildings across the nation

- **Build environment certification system for all types of cars**
  Manage emission from produced vehicles and those in operation

Comprehensive Air Quality Index(2006)

Good	Normal	Sensitive	Bad	Worse	Danger

Nature and Ecology

● **Study on Biodiversity across the Nation**

- **Started the first natural environment investigation in 1986**
- Results of the investigations
  - **· First (1986-1990) : created map of degree of green naturality**
  - **· Second (1997-2005) : Created map of ecological naturality**
  - **· Third [2006-2013) : Improve map of ecological naturality**
- **Third natural environment investigation (2006-2013)**
  - **· Investigated areas : 9 areas such as geography, vegetation, fauna and flora**

● Nationwide Ecological Map('07. 4. 11)

- **Compile results of natural environment investigation and good ecosystem (Baekdu-daegan, deserted islands, coastal san dunes, and estuaries) and built GIS-DB**
- **classify them into three grades and separate them as special management areas based on vegetation classes, presence of endangered species and landscape**
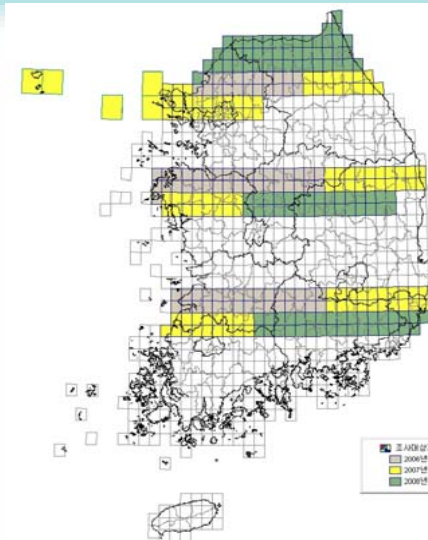
Ecological Corridor

Improvement of Pollution Test Methods

- The method was developed in the 1980s, and improved for international certification.

- Management of QA/QC System
  - Control quality of environmental measurement devices

- Establishment of Standard Test Methods for 76 POPs to Support Regulations on POPs Management

Items developed or adjusted (240 items)
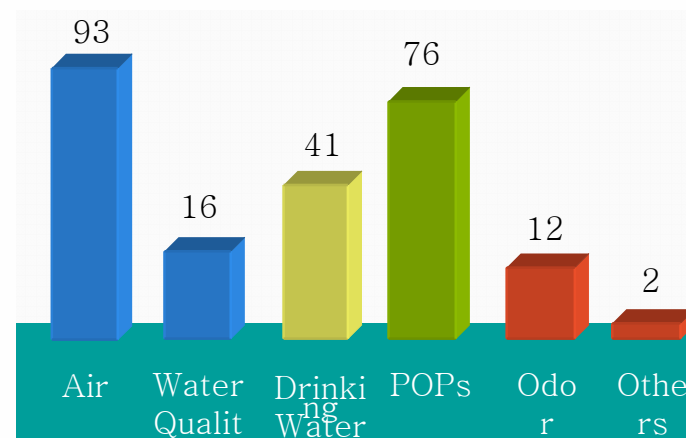
2 **Future 30 Years of NIER**

1. **Restructuring of NIER**

2. **Strengthening of Research Capacity**

3. **NIER Strategic Research**

1. Restructuring of NIER

Present

Plan

- 6 Departments, 6 Research Centers

- 5 Departments, 6 Research Centers

President

- Environmental Diagnostics Research Department
- Environmental Health Research Department
- Chemical Assessment Department
- Nature and Ecology Research Department
- Environmental Cap System Research Department
- Environmental Measurement Standards Department
- Global Environment Research Center
- Transportation Pollution Research Center
- Environment Research Centers of 4 Rivers

President

- Research Strategy Planning Department
- Environmental Health Risk Department
- Climate Air Research Department
- Water Environment Research Department
- Nature and Ecology Research Department
- Transportation Pollution Research Center
- Environment Research Centers of 4 Rivers
- Resource Recirculation Center

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2. Strengthening of Research Capacity

Post-Doctoral Researcher System

Master Student Program between NIER and University

Internal Seminar and Workshop

Research Product Assessment System

Experiment Program for Children

3. NIER Strategic Research   Goals

1) Climate Change Research

   Clean Air

2) Biodiversity Conservation Research

   Sustainable Ecosystem

3) Environmental Hazard/Risk Research

   Clean-up Risk

4) Air Quality Research

   Clean Air

5) Water Quality Research

   Safe Water

6) Drinking Water Research

   Safe Water

7) Waste/Material Recycling Research

   Sound Recycling

8) Land Protection Research

   Sound Recycling

1) Climate Change Research

− Address one of the biggest tasks of human beings in the 21st century

  (United Nations Framework Convention http://unfccc.int/2860.php)

- Reduction in greenhouse gas is the major agenda to prevent climate change

  (G8 Outreach Session, July 2008)

- Suggest low carbon, green growth as a vision of 60 years to come

  (Congratulatory remarks in August 15, 2008)

Study on greenhouse gas emission and its reduction

  ⇒ A task force team is being operated (August 2008-)

Study on causes of climate change

Study on effects of climate change on environment and human health

  ⇒ Evaluate • predict ecological and health effects

Policies to support low carbon economy and climate change prevention

2) Biodiversity Conservation Research

- Securing biological assets and information emerges as a matter of national competitiveness.
- Study to secure health • consistency of natural ecosystem

Evaluate biodiversity of nation and build the information into a database

Study on effects • disruption of climate change

Environmental Specimen Bank

Ecological time capsule periodically collected samples of animals, plants,
soil and geology of polluted or non polluted areas at −150℃
→ trace back pollutions and their ecological impacts of the past

Construction period: 2007-2010

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3) Environmental Hazard / Risk Research

- There is an increasing risk of low concentration/chronic exposures to various toxic materials.

- Risk assessment is expected to become a key factor in process of building environmental policies.

⇒ Human health research supports decision making

- Study on toxic materials with adverse effects and risk assessment

⇒ Chemical • physical • biological factors

(toxic chemicals, electromagnetic wave, pathogen and others)
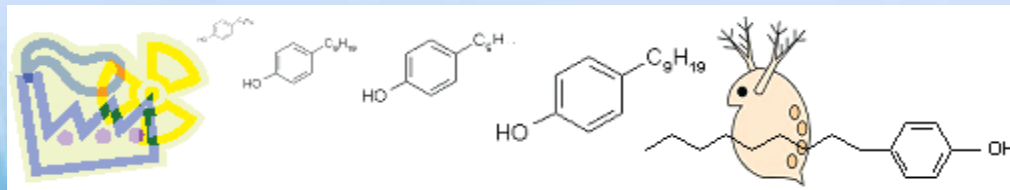
Hazard Assessment on Environmentally Concerned Materials

⇒ Hazard assessment on environmentally concerned/new materials
within different media such as water, air and soil.

Study on New Toxicity • Metabolites such as Toxicity Prediction Technology

⇒ Toxicity tests using molecula biological technique

Study on Link between Environmental Pollutions and Health Impacts

 (Environmental Diseases)

Cumulative Risk Research

Risk Assessment on Multi-media and Multi-exposure

- Integrated Exposure/Risk Assessment
- Develop Tools for Risk Assessment and Risk Management Decisions

Environmental Toxicity Research Building

■ **Toxicity Research Facility Construction •
Operation** (2004 -)

Ecological toxicity test facilities such as nursery for
Fish and Daphnia, exposure lab. and ordinary lab.

⇒ Toxicity tests with utilizing native species

Medaka fish

Flow-through Toxicity System

■ **Construction of Health Risk Test
Facilities** (2007–2008)

Rodents toxicity test equipments, clean room
system, and respiratory test equipment

4) Air Quality Research

- Address it as a pollution directly affecting human health
- Conduct studies on microparticles, odor and other air pollutants and seek Measures to improve air quality

◼ Study on PM Measuring Technologies, Monitoring and Reduction
  ⇒ PM_{10}, Ozone, Odor and Multi-Pollutants
  ⇒ PM_{10} in Seoul: $60 \mu g/m^3$ (in 2006) => $40 \mu g/m^3$ (in 2012)

◼ Indoor Air Pollutants Monitoring and Evaluation on Features

◼ Study on Features of Car Emission and Reduction

◼ Evaluation on Human Health Risk Caused by Indoor • Outdoor Air Quality

5) Water Quality Research

- Create a clean water environment where fish can live and kids can swim
  (Medium-and long-term water protection policies 2006-2015)
- Provide correct information on securing safety of water environment

Advancement of Water Environment Standards and Evaluation Methods
⇒ Develop Biological/physical and chemical monitoring, eutrophication and sediment control standard

Construction of investigation and evaluation structure targeting water ecosystem

Development, expansion and operation of water environment data system

Study for water resources preservation and management

6) Drinking Water Research

- Address it as a pollution directly related to human health
- Investigate and assess diversifying drinking water sources and quality

■ Monitoring on Toxic Materials in Drinking Water, Evaluation and
Study to Improve the quality

■ Improvement of Water Treatment Facilities and Supply

■ Assessment on Health Impacts and Management of Risks of Drinking Water

Risk Assessment /
Risk Management ⬅➡ Drinking Water
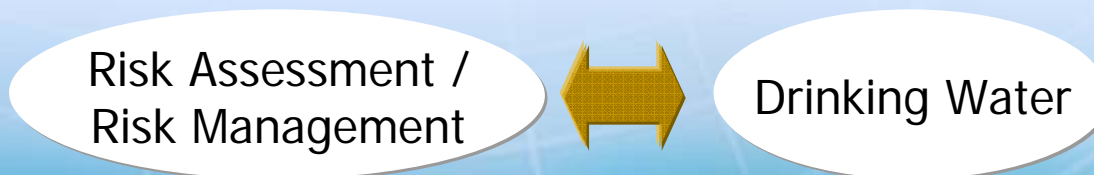
Providing the Science

7) Waste/Material Recycling Research

- Consolidate sustainable recycling process (2nd Comprehensive Waste Management Plan)

⇒ Production and Consumption are not horizontal. They are in one cycle.

- Study on safe management of toxic waste and waste recycling
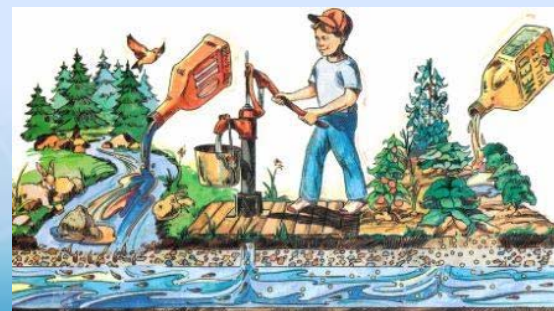
Study to advance toxic waste treatment and management

Study on conversion of waste into assets or energy (in relation to climate change)
 - **Designing and evaluating material cycle systems**

Assessment on soil/ground water pollutions and study on purifying measures

Assessment on environment of national land and study on restoration (in relation to waste treatment)

8) Land Protection Research

- Countermeasures against damages and pollutions on national environment caused by urbanization and industrialization
- Evaluation on pollution and restoration study in relation to ecosystem protection

Study on Soil Pollution Assessment and Polluted Area Restoration

Assessment on National Land Environment, Land Use Research

Winter

Thank you for Attention !!!