

# National Climate Change Adaptation Measures in Korea



Jung, Mun-hee

Global Environment Division

Ministry of Environment



A decorative sunburst graphic is located in the top left corner, featuring a bright sun with rays emanating from it, set against a blue sky background with white clouds.

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**II** Impacts of Climate Change on Korea

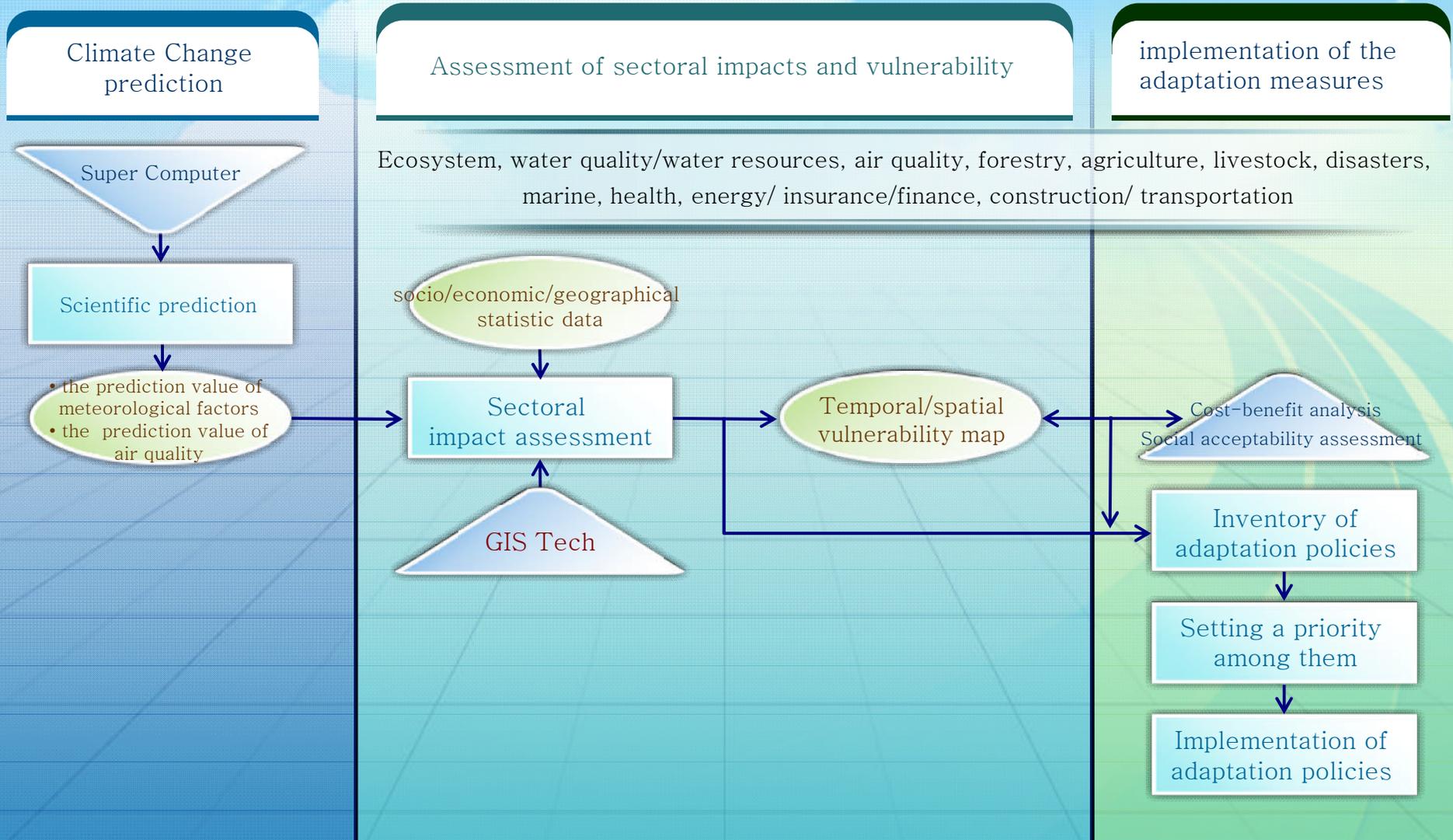
**III** Strategies for Climate Change Adaptation

# I

# Science based Climate Change Adaptation

# I. Science Based Climate Change Adaptation

## Procedures for Adaptation Measures

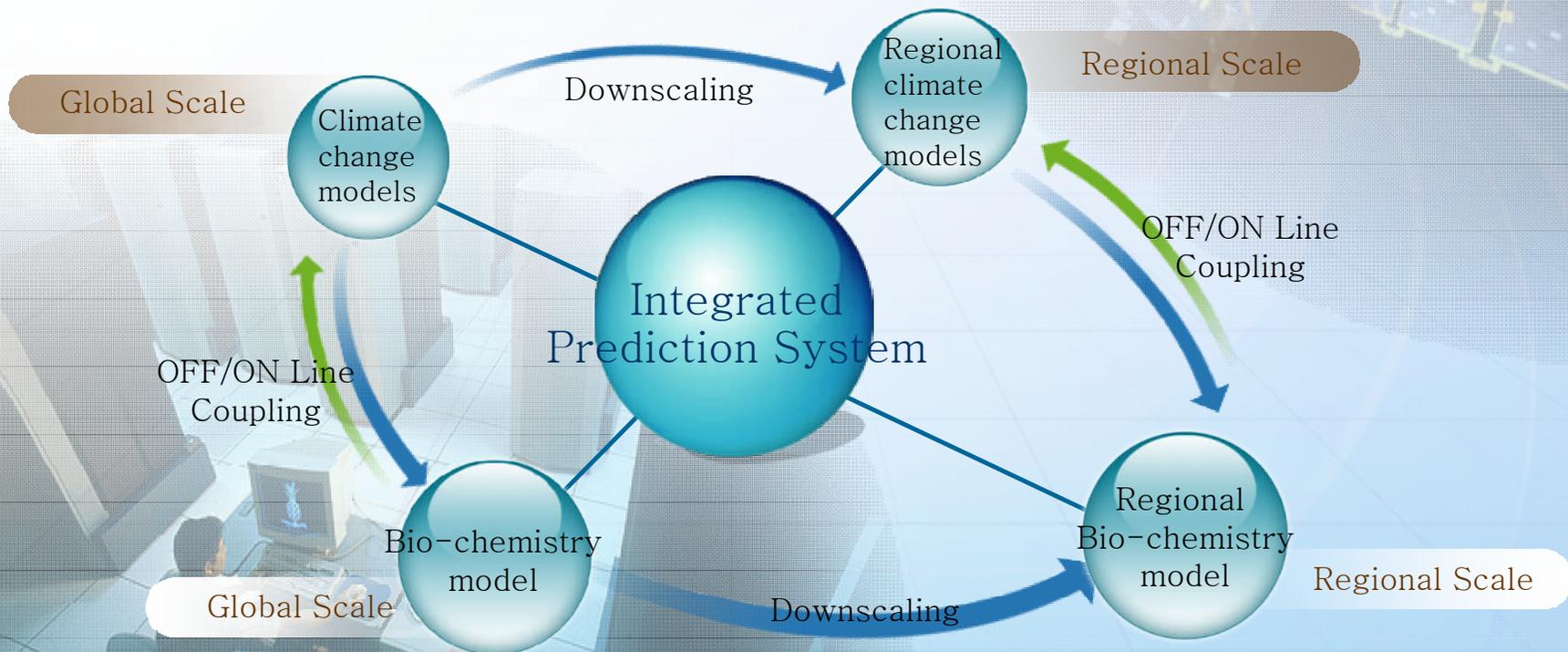


# I. Science Based Climate Change Adaptation



## Exemplary climate change research

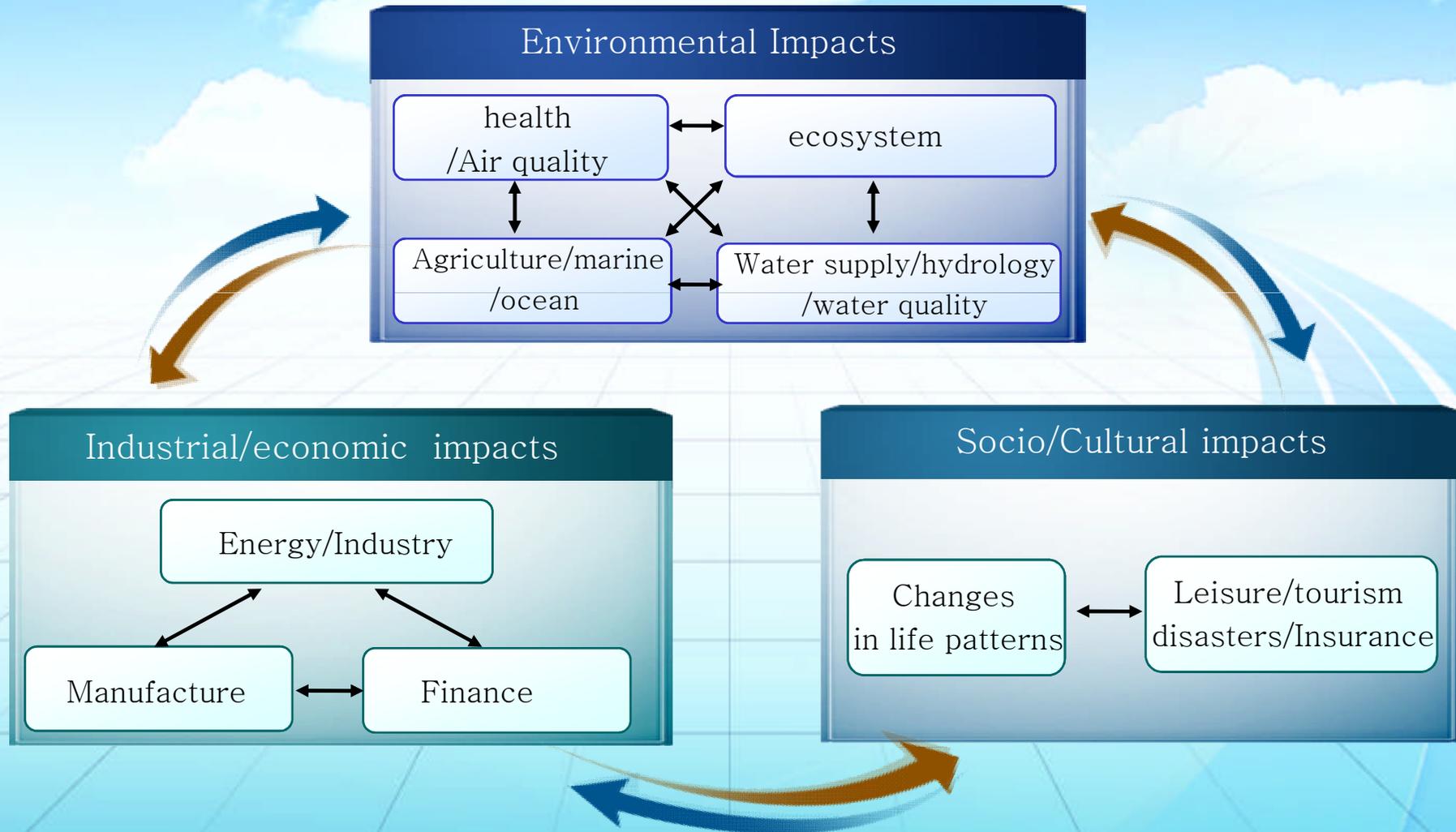
- **Integrated modeling for climate change models with bio-chemical module**
  - Estimation of a national climate scenario, employing a range of models
- **Mid/long-term climate change monitorings**  
(ground, aircraft, ship, satellites)



# I. Science Based Climate Change Adaptation



## Analysis of Sectoral Inter-relationship



A Roman numeral 'II' inside a circular graphic with a gradient and a shadow effect.

## Impacts of Climate Change on Korea

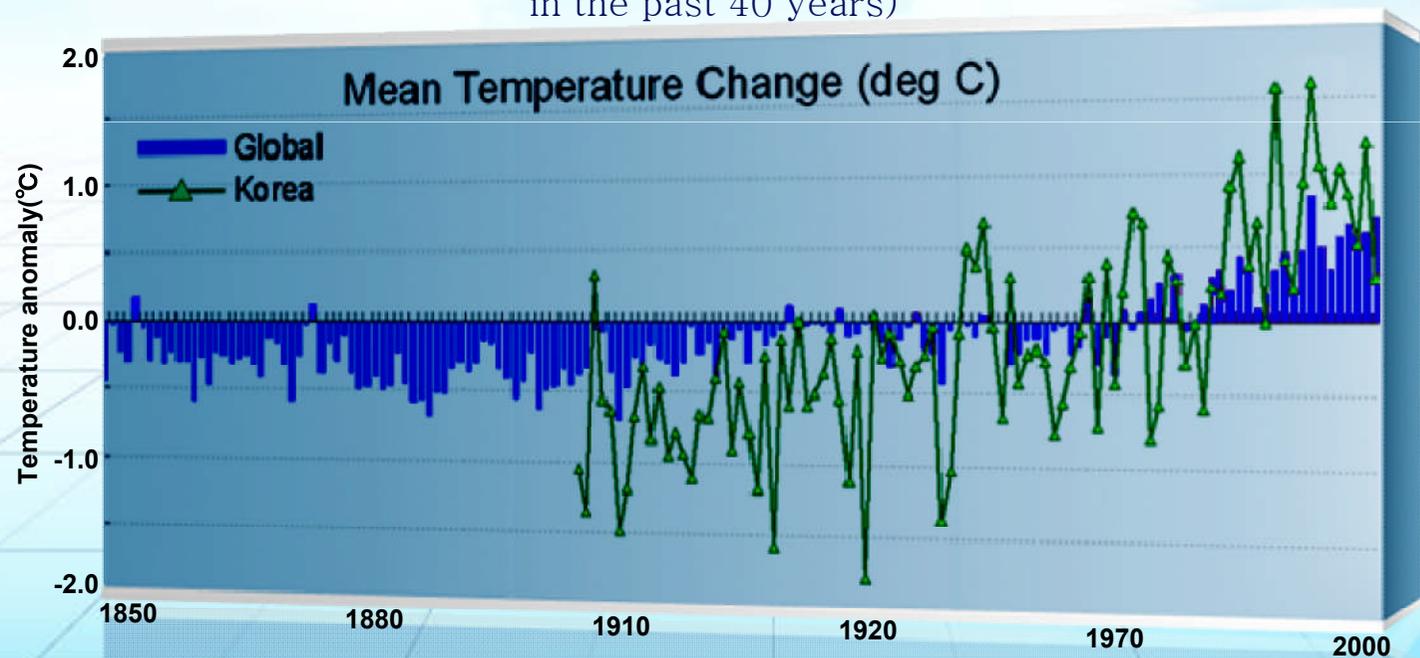


## II. Impacts of Climate Change on Korea



### Observed Climate Change on the Korean Peninsula

- **Temperature** rise: twice as the global mean temperature rise (1.5°C up in the past 100 years)
- **Sea level** rise (Jeju Island) : Three times as the global mean sea level rise (22cm increase in the past 40 years)



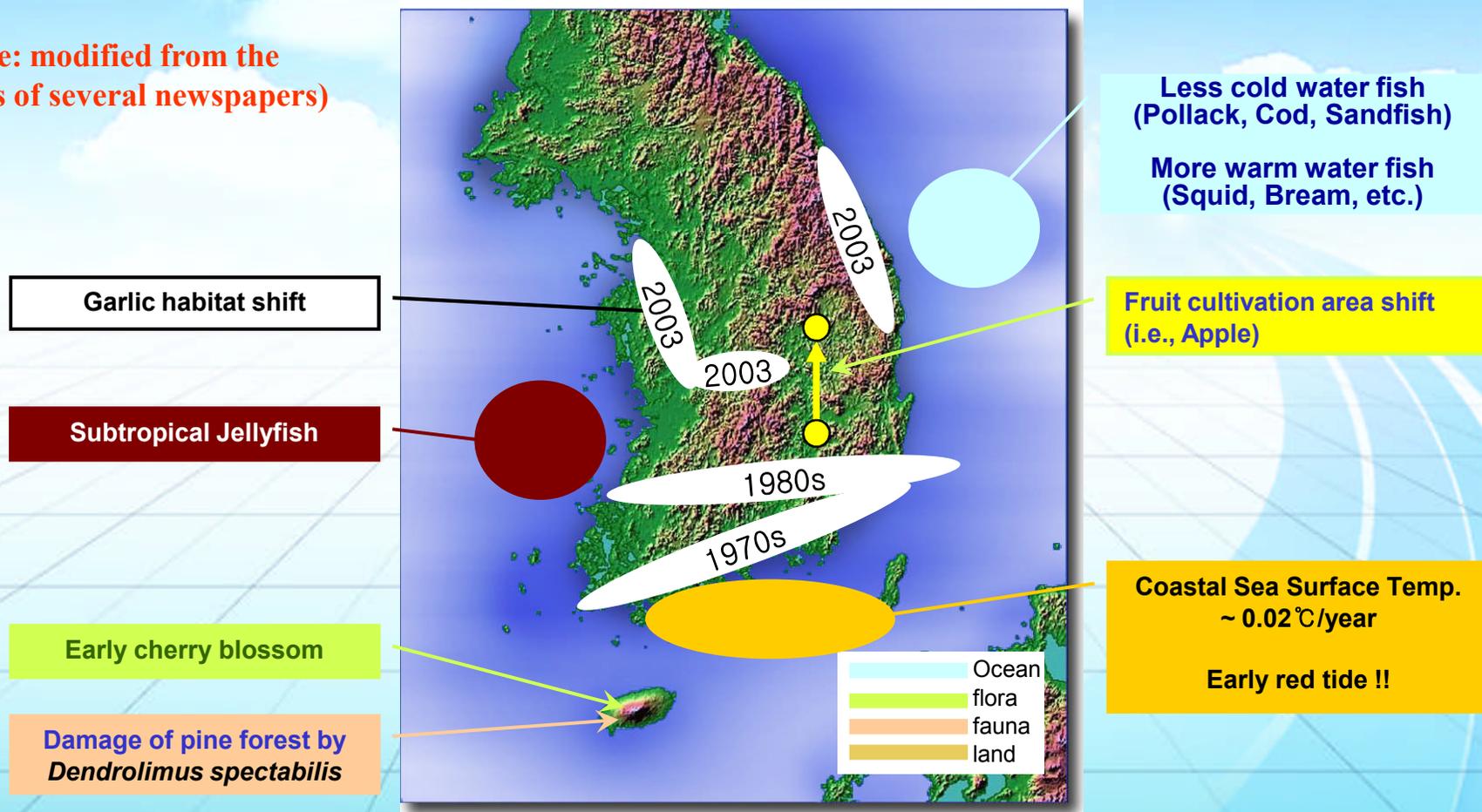
(METRI, 2005; NORI, 2006)

## II. Impacts of Climate Change on Korea



### Observed Impacts of Climate Change over the Korean Peninsula

(Source: modified from the reports of several newspapers)



Also, Summer Epidemic breaks out early !!

## II. Impacts of Climate Change on Korea

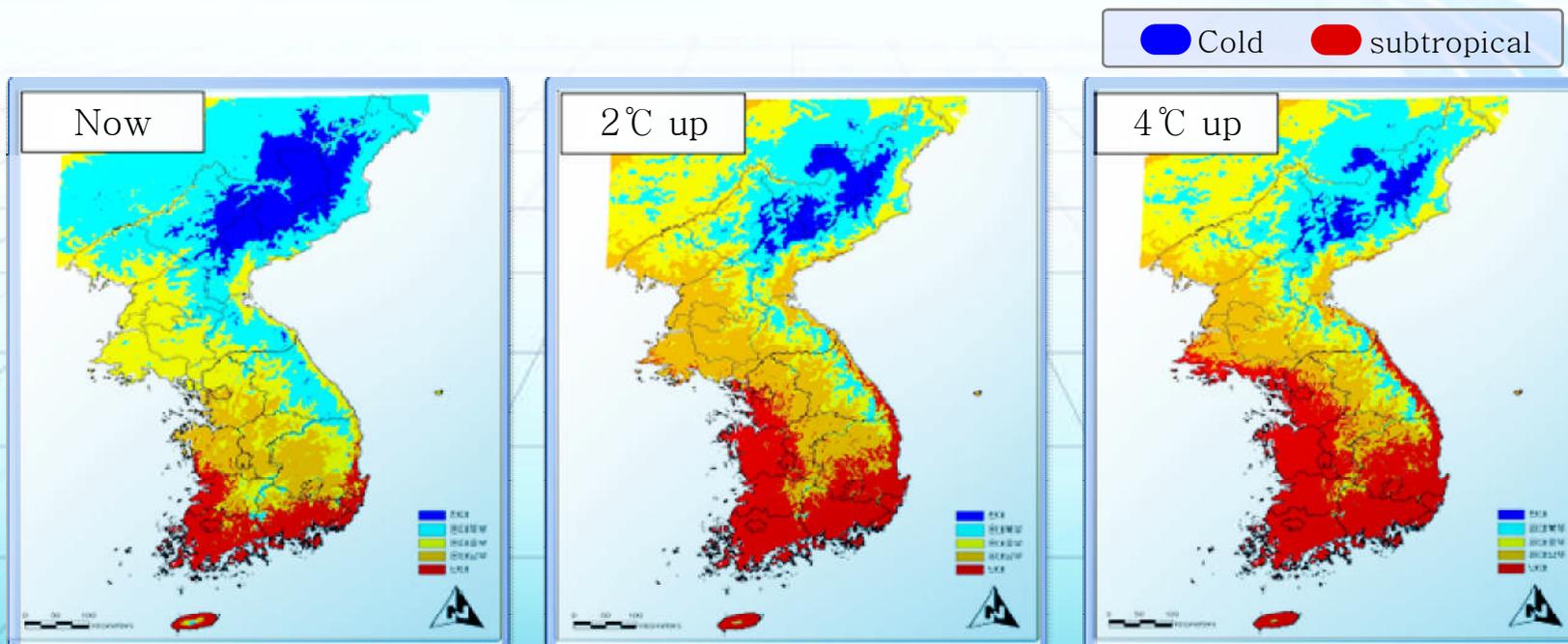


### Climate zones shift in future



Climate zone shift

- In 2030 (2°C rise) : shift of **subtropical** zone to northward
- In 2065 (4°C rise) : most residential areas change into the **subtropical** zone



(Korea Forestry Research Industry, 2005)

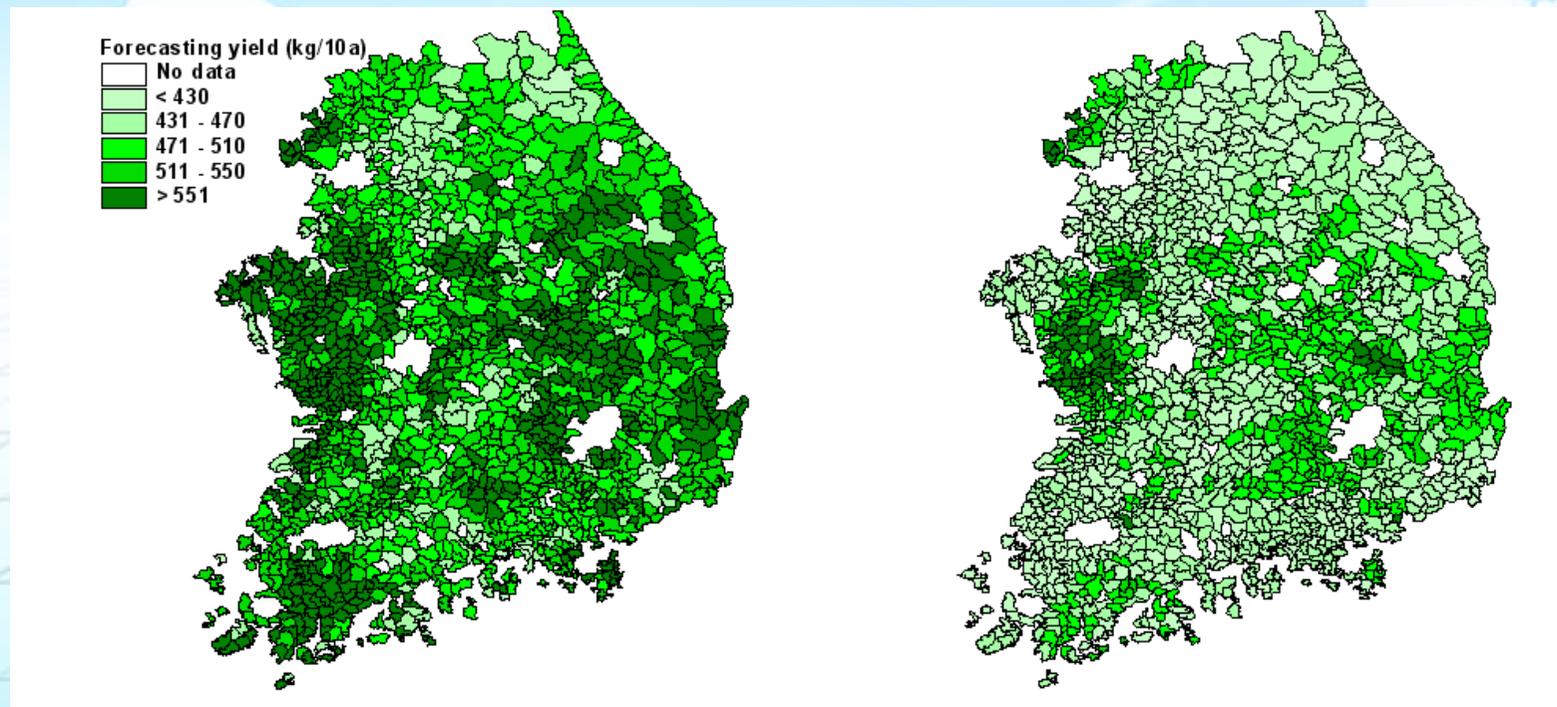
## II. Impacts of Climate Change on Korea



### Change of rice yield in future

•[1971-2000 average]

•[2080s forecasting]



Overall yield of rice : 14.9% (802 kg/ha) decrease !!

(Source: Korea Environment Institute, 2006)

## II. Impacts of Climate Change on Korea



### Sectoral Impacts on Korea

• Environ./  
• Health

#### Air quality

- Increases in PM10 and O<sub>3</sub> Concentrations and Asian Dust

#### Water resources

- River water rise

#### Water quality

- increases in turbid water caused by soil loss
- Fish kills and eutrophication caused by reduced dissolved oxygen (DO)

#### Health

- Heavy death toll by the heat waves ( a total of 2,127 during the last decade )
- Increases in malaria patients ( 5 in '94 → 2,051 in '06 )



## II. Impacts of Climate Change on Korea



### Sectoral impacts on Korea

#### Ecosystem

##### Land

- **Shift of vegetation zones** (a 5km northward shift of the broad-leaved forest per year)
- **Reduction of biodiversity** (Alpine plants of Halla Mt. in danger of extinction )
- **Northward shift of cultivation region** (Apples : Daegu→ Yeongwol, Green tea: Bosung→Gosung, Hallabong : Jeju→Geoje)
- **Early spring blooming** (shortening of the flowering times for forsythia and azalea by about 20 days for the past 80 years)
- **Increases in plant diseases** (Pine wilt disease, Ussur Brown Katydid, Oak wilt, and acacia tree etiolation)
- Reduction in crop productions and harvesting areas

##### Ocean

- **Decrease in arctic fishes** (pollack, Cod)
- **Increase in warmer water fish** (squid, porgies)
- Increases in red tides, whitening events and the appearance of noxious jellyfish

## II. Impacts of Climate Change on Korea



### Sectoral Impacts on Korea

#### •Meteor. •Disaster

- **Increases** in damage caused by **natural disasters**
  - ※ Typhoon 'Rusa' ['02] : the cost of 5.46 bn US\$, with the death of 125
  - Typhoon 'Maemi' ['03] : the cost of 4.78 bn US\$, with the death of 117
- Damages caused by “**severe rains**”
- Increases in **damage from floods** by **3.2 times** per **decade**
- Loss of coast lines **by sea level rise, inundation and overflow**
  - The projected area of inundation per 50cm rise in sea level is 1.4 times of Seoul area

# III

## Strategies for Climate Change Adaptation

# III. Strategies on Climate Change Adaptation

## National Adaption Policy-Setting of Korea

### "National Comprehensive Plan for Climate Change Adaptation

• **VISION** : Establishment of **Safe Society & Support for Green Growth** through **Climate Change Adaptation**

- In May 2007, the **National Committee on Climate Change Response** chaired by Prime Minister decided to develop a '**National Comprehensive (master) Plan for Climate Change Adaptation**'.
- With the numerous efforts including research and reviewing processes by experts of climate change, the **government of Korea (Ministry of Environment)** set up the **plan** and officially announced to the public on **December 24th, 2008**.
- 14 Ministries Participating
  - - Leading by Ministry of Environment

# III. Strategies on Climate Change Adaptation

## • Strategy

National Comprehensive Plan for Climate Change Adaptation

: consist of 183 projects total

### Climate Change Risk Assessment

Monitoring  
Forecasting

Impact  
Assessment

Vulnerability  
Assessment



### Climate Change Adaptation Program

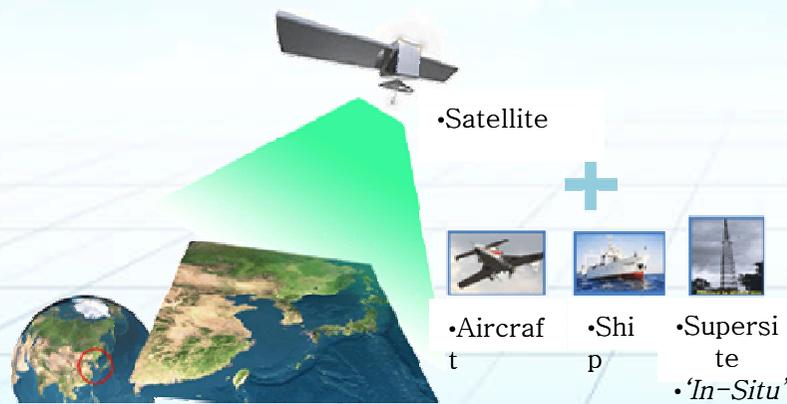
- Eco-system : Land (Agriculture, Forest, Mountain), Water
- Water Resource and Quality Management
- Human Health
- Disaster Prevention and Risk Control
- Adaptation related Business and Energy
- SOC : Infrastructure, Urban Design, etc

# III. Strategies on Climate Change Adaptation

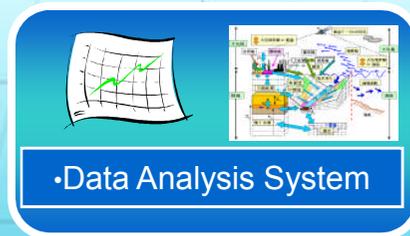
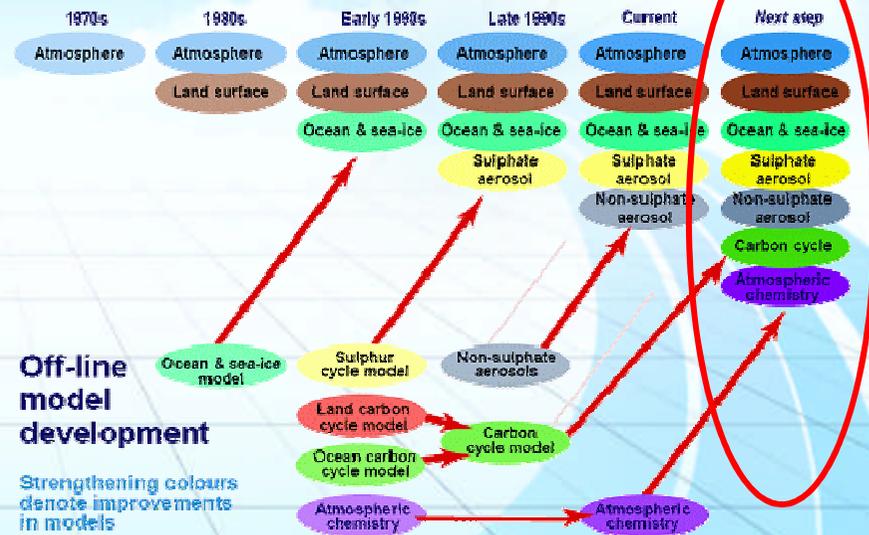
## •Climate Change Risk Assessment

•○ Improvement of the **capability to monitoring and forecasting** of climate ch

•3-dimensional monitoring network



•Integrated Modeling System

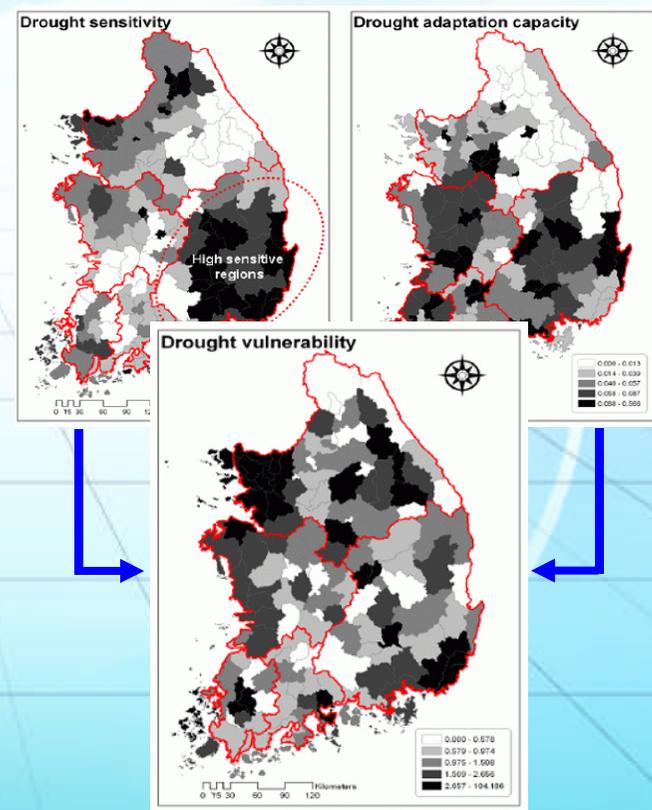
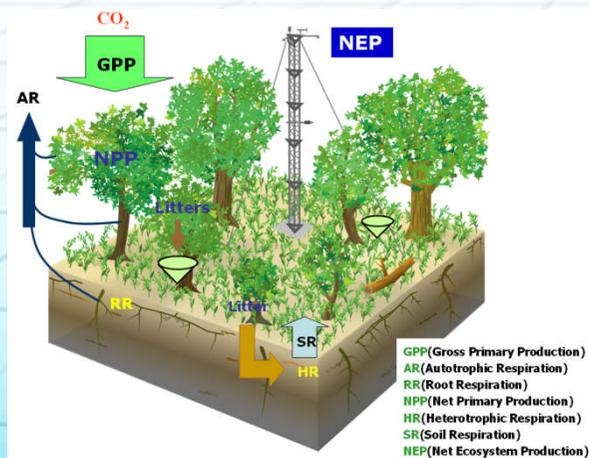


# III. Strategies on Climate Change Adaptation

## Climate Change Risk Assessment

- Long term monitoring of the impact
- Impact/Resilience Assessment and National Long Term Ecological Research Vulnerability Mapping for each sector
  - i.e.)
  - Impact Assessment
  - Resilience Assessment
- Since yr2003, Total 17 Sites
- Including Land, Fresh Water, Coastal, Animal

•i.e.) Carbon Cycle Monitoring



•Vulnerability mapping

### III. Strategies on Climate Change Adaptation

#### Climate Change Adaptation Program

- **Water resource and quality** management program
  - Renewing the Mid/Long term **National Water Resource Management Plan**
  - Developing environment-friendly **Stable Water Supply System**

•Current Status



•i.e.) Nakdong River

•Anticipating Changes



# III. Strategies on Climate Change Adaptation

## Climate Change Adaptation Program

### ○ Human health management program

- Developing the **surveillance and control systems** for vector-borne diseases
- Launching the **national research project for environmental health (10 Mil. \$ / yr)**

### ‘Heat/Health Watch-Warning System’

Synoptic Health Watch-Warning

System levels:

EXCESSIVE HEAT WARNING

Dangerous heat stress conditions, which historically have led to excess mortality, are forecast to occur within the next 24 hours.

HEAT ADVISORY

Heat stress conditions, which might be associated with excess mortality, are forecast to occur within the next 24 hours.

HEAT WATCH

Potentially life-threatening heat stress conditions are forecast to occur in the next 24 to 48 hours.

NO ADVISORY

Weather conditions are not forecast to be oppressive.

Network		Seoul, South Korea			
Time	<i>SBOUL forecast issued 05/29/2008 03:15:01</i>				
	03h	09h	15h	21h	
May 28	Transition				
<b>NO ADVISORY</b>					
Temperature / Dew Point	19 / 17	17 / 17	19 / 18	19 / 19	
May 29	Transition				
<b>NO ADVISORY</b>					
Temperature / Dew Point	18 / 18	23 / 19	29 / 20	19 / 17	

# III. Strategies on Climate Change Adaptation

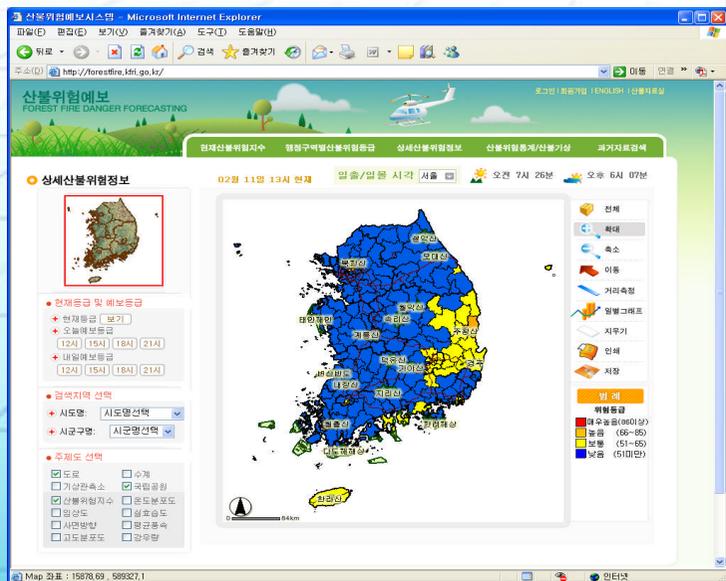
## Climate Change Adaptation Program

### ○ Disaster control program

- Linkage between national development plan and the disaster control plan
- Preparation of the standardized manual and guideline for disaster response
- Introduction of a disaster insurance program

•‘Forest Fire Danger Forecasting WEB’

•‘Guideline : For Safety Life’



# III. Strategies on Climate Change Adaptation

## Climate Change Adaptation Program

- Building **climate resilient city**
  - Planning **disaster control and response system** to minimize the impact of climate change on the social infrastructure
  - Construction of '**Green Zone**' in the residential area
  - '**Roof Garden**' to mitigate global warming

### ·Green Daegu Project

- 2007~2011 (5 yrs / 400 Mil. \$)
- **Green Park, Green Zone, Green roof**



## III. Strategies on Climate Change Adaptation

### • Domestic and International Cooperation

#### ○ National level capacity building for adaptation

- Enhancing the legal and administrative framework
  - . Incorporation of the climate change risk into national long-term plans and policies
  - . National Climate Change Adaptation Center
- Supporting the local government to get the relevant adaptation option
  - . Provision with 'Guideline and tools' for climate change adaptation

#### ○ Domestic and International cooperation

- Establishing the partnership with various stake-holders
- Promote the 'Green Start Campaign' to enhance public awareness
- Enhancing the international cooperation with UNEP, WMO, IPCC and etc



Thank You