

# Economic Analysis of Climate Change in Korea

- Integrated analysis using PAGE model -

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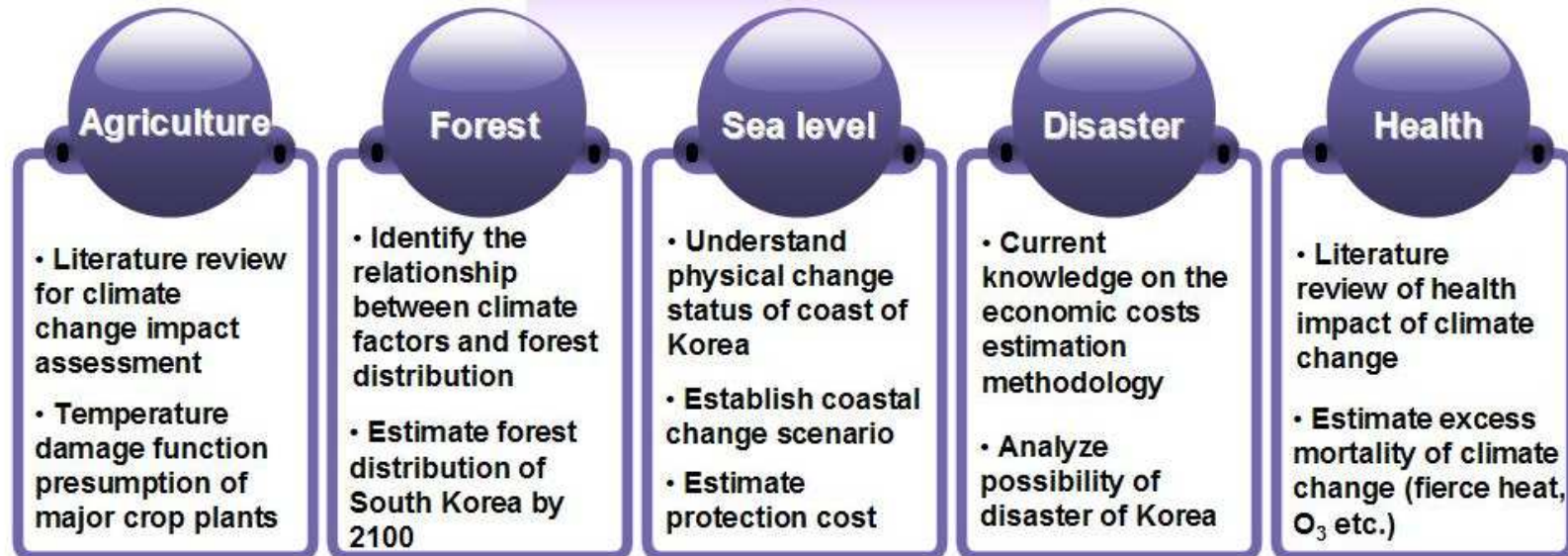
Korea Environment Institute



# Climate change damage assessment by sector

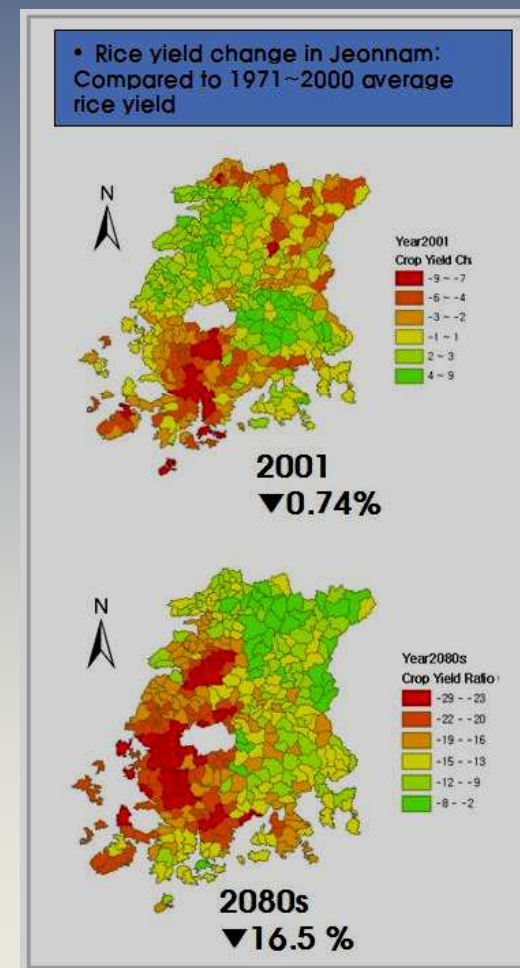
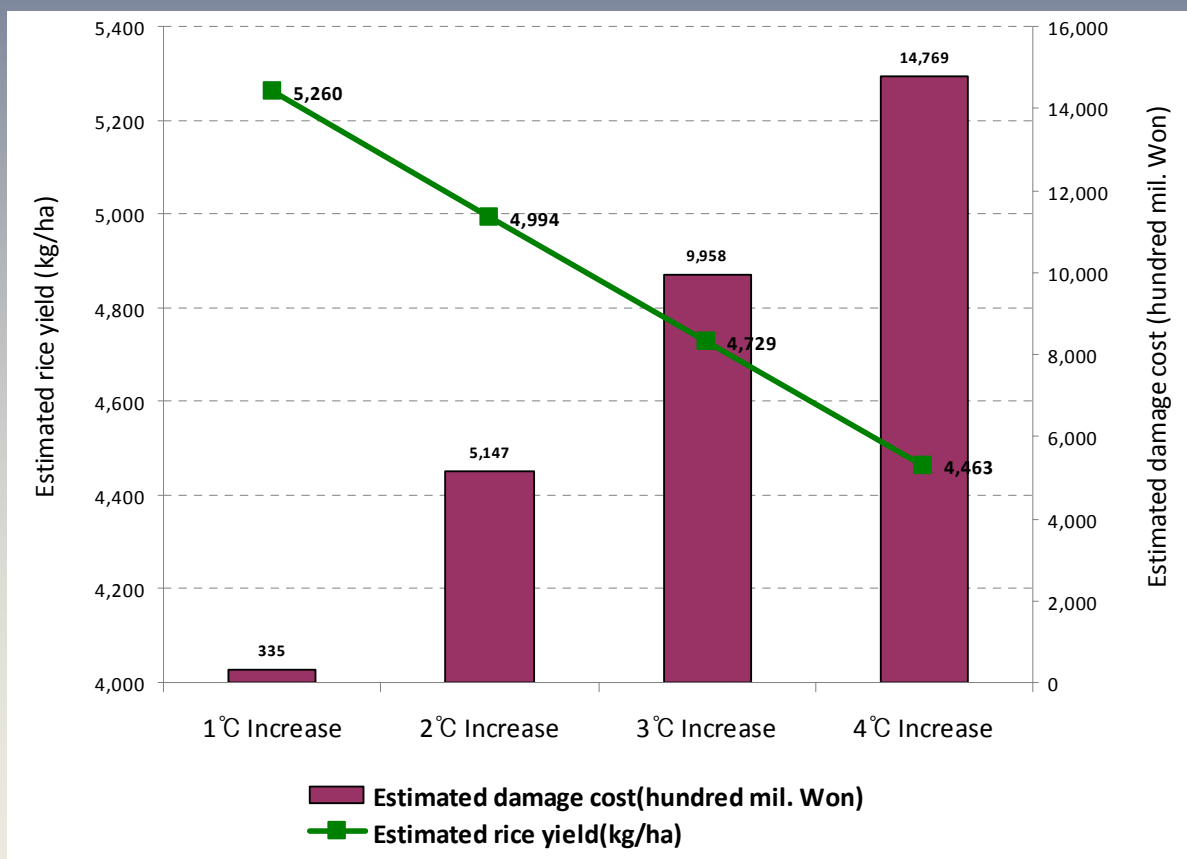
## Estimate cost function of climate change

- Analyze economic mechanisms of climate change of South Korea
- Establish damage function of climate change by sector



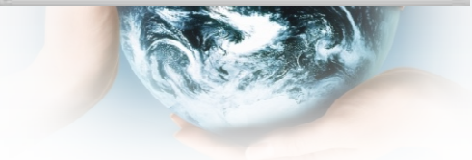
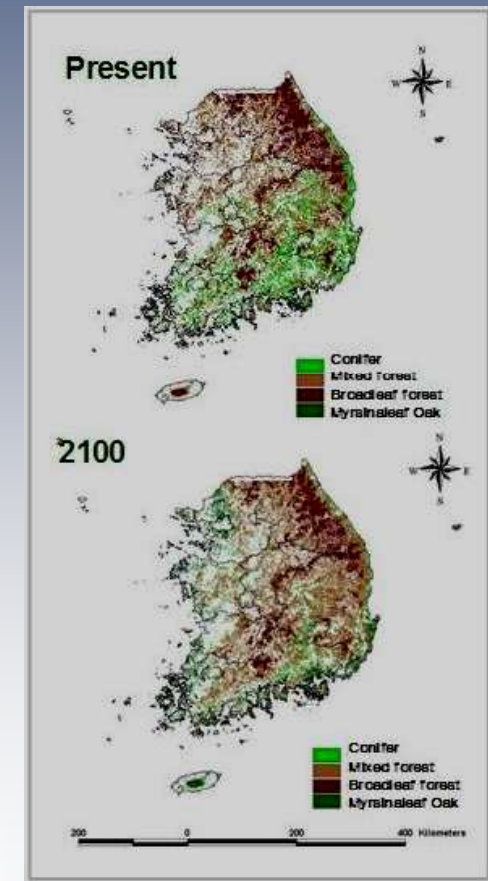
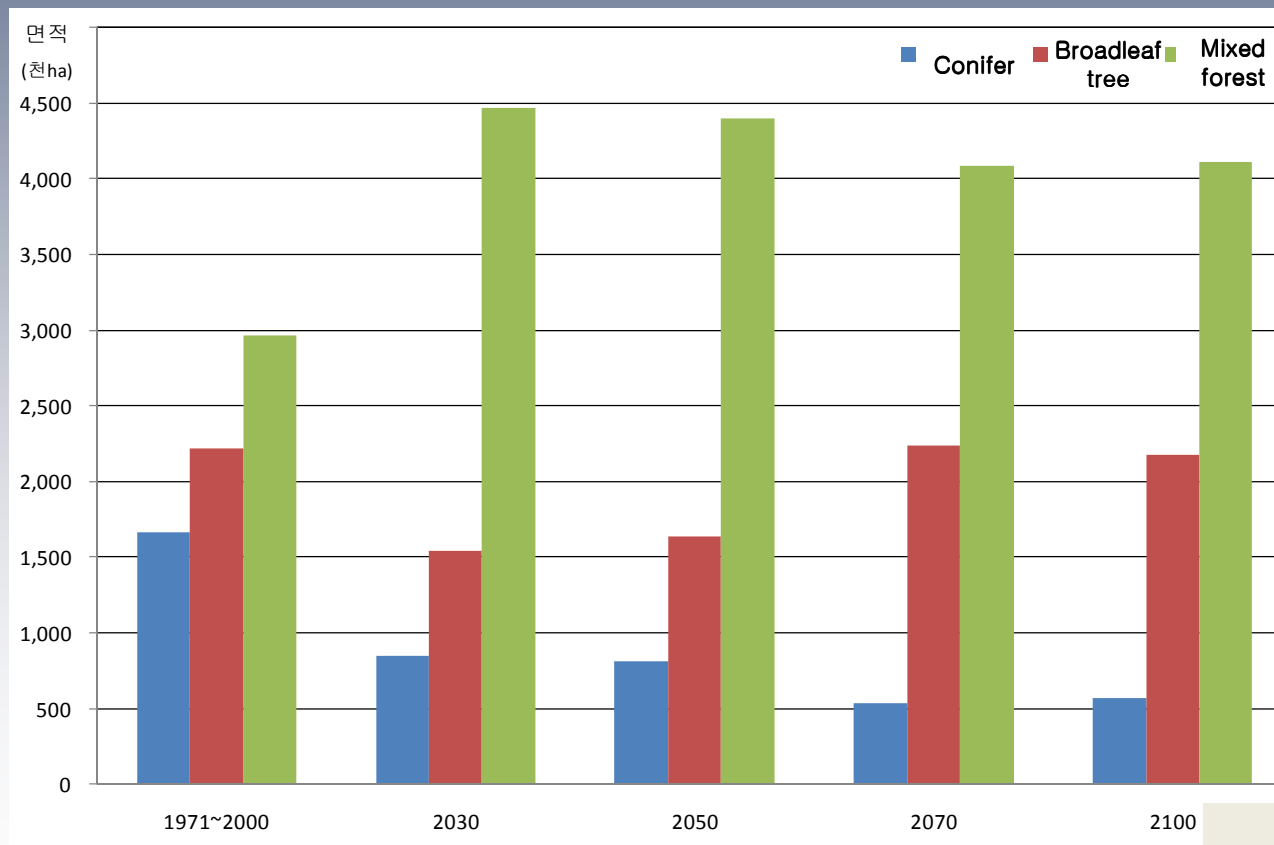
# Agriculture: Rice yield change

Rice yield change (kg/ha) & Damage cost (hundred mil. Won) by temperature



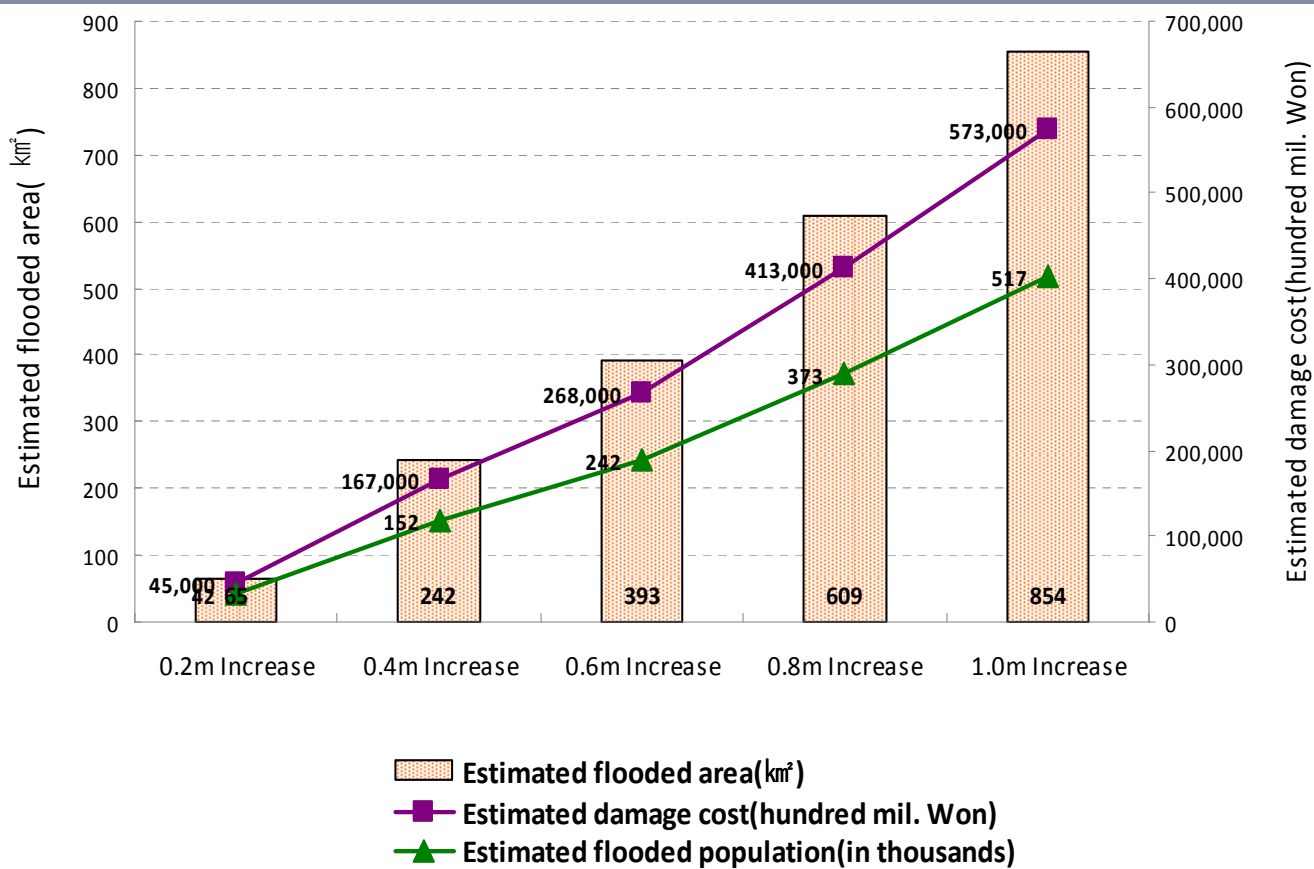
# Forest : Distribution change

## Forest distribution change



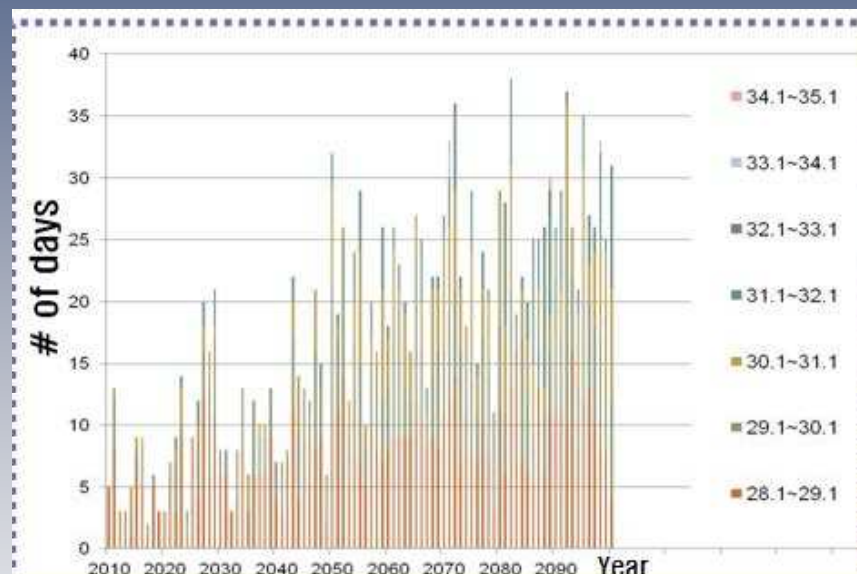
# Coastal area

Flooded Area (km<sup>2</sup>),  
Damage cost (hundred mil. Won) &  
Flooded population (number) with sea level rise, Dry Area





# Health : Mortality change by heat wave



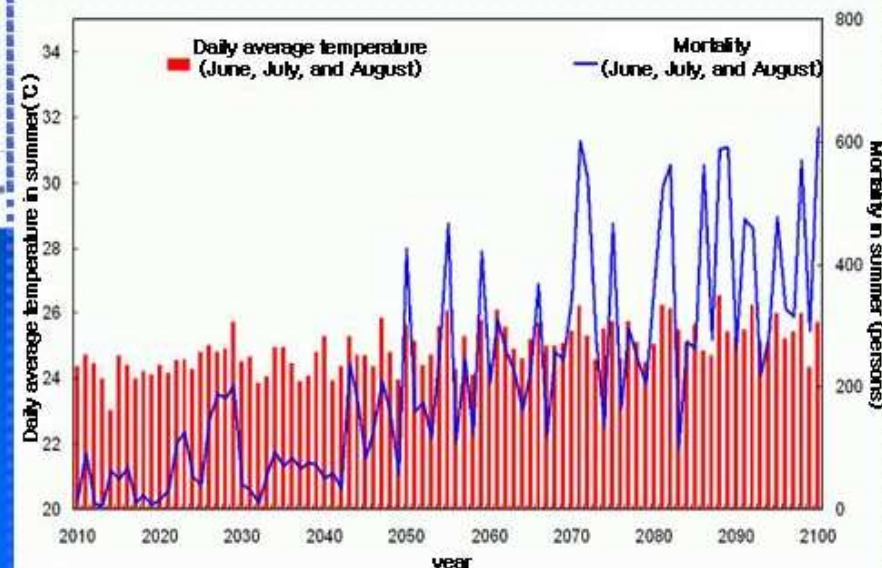
No. of days daily average temperature above 28.1 °C (Seoul)

Year	No. of days
2010 ~ 2040	270
2041 ~ 2070	571
2071 ~ 2100	787

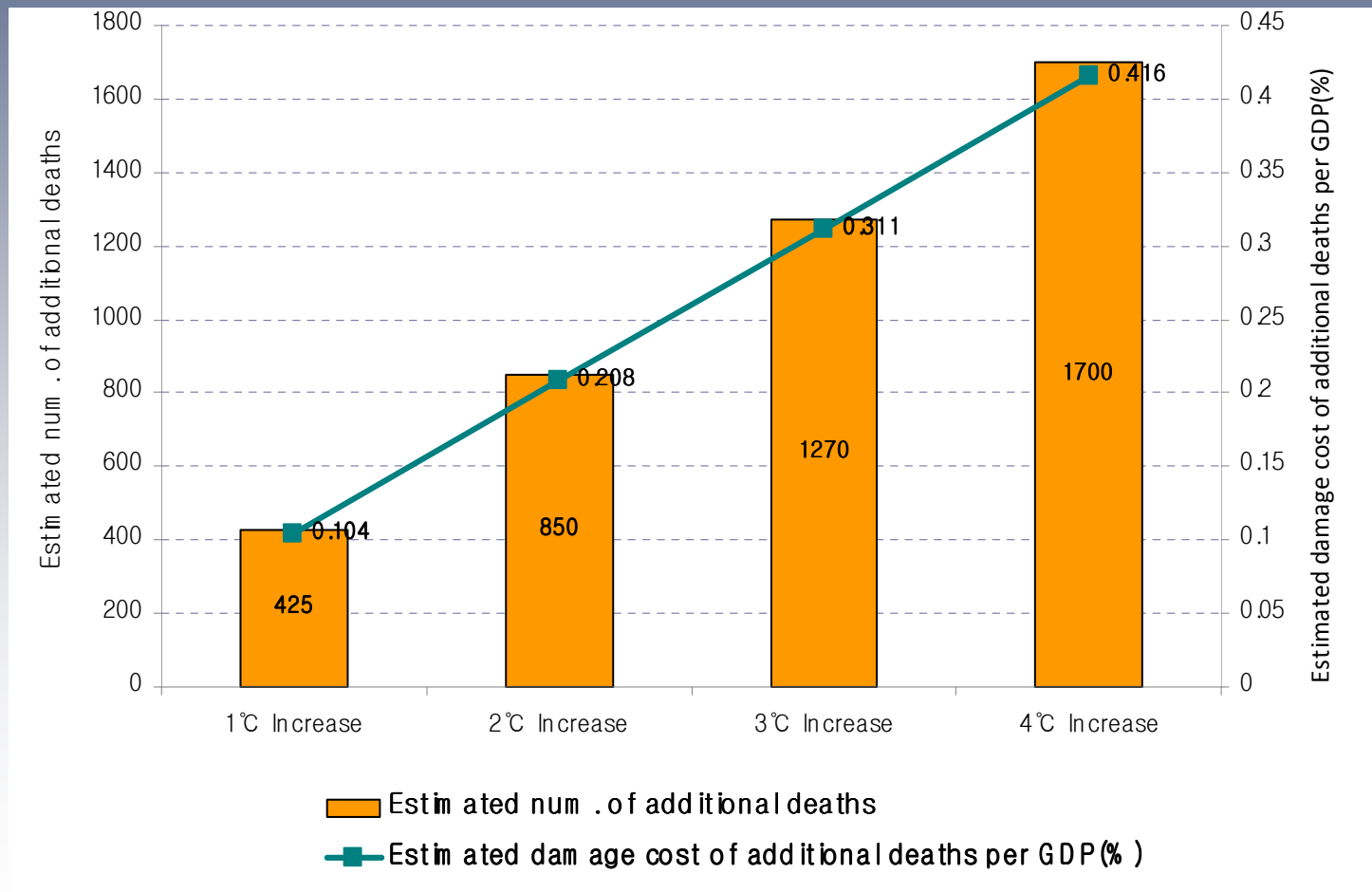
## Mortality change by heat wave

Year	Mortality change in summer		
	mean	Minimum 95%	Maximum 95%
2010 ~ 2040	67	56	79
2041 ~ 2070	212	176	249
2071 ~ 2100	378	312	446

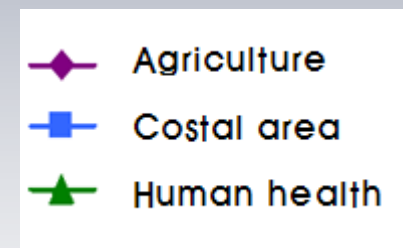
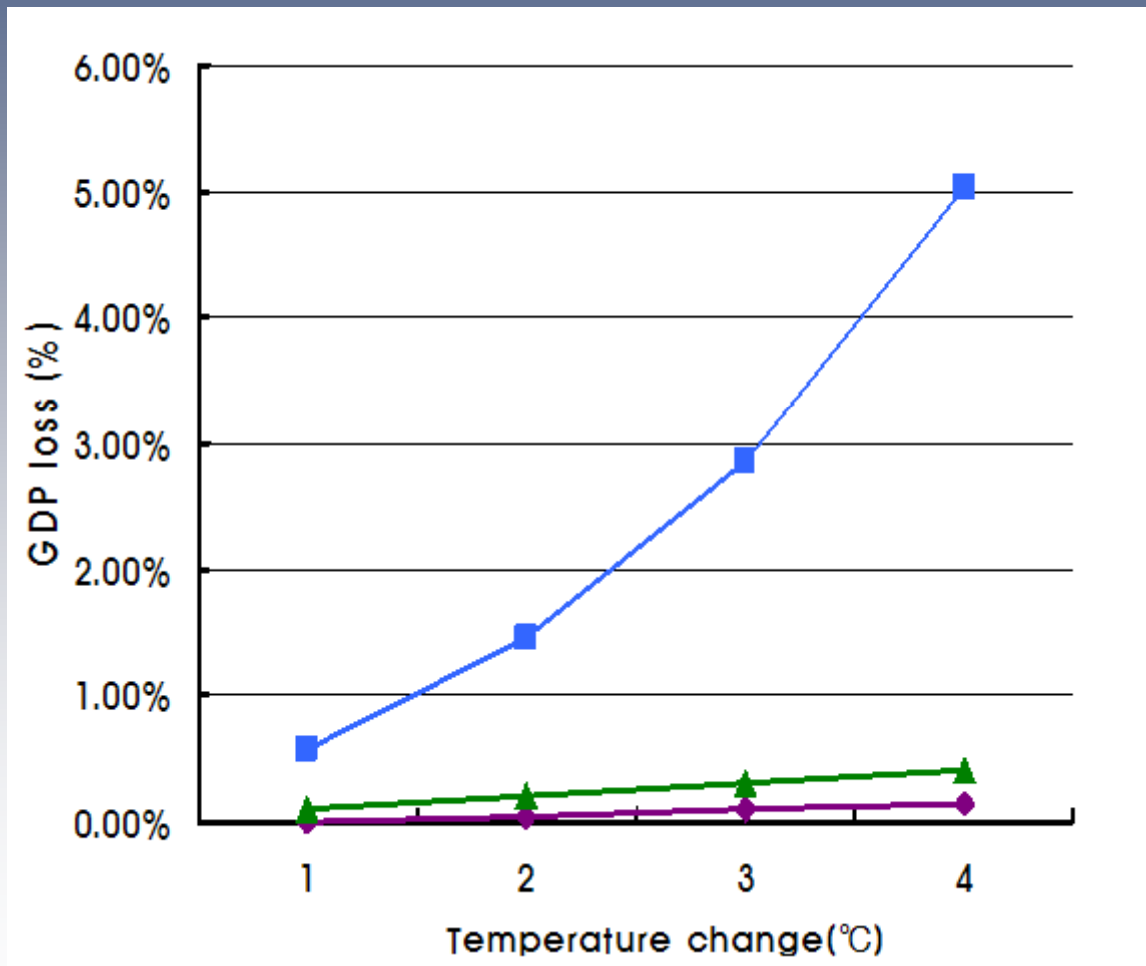
▷ No. of days daily average temp. above 28.1°C : 10-15 days (mean), mortality : less than 100 persons (mean)  
(High temp. in 1994 : No. of daily average temp. above 28.1°C, 33 days, mortality: above 800 persons)



# Health : Estimated number of deaths and damage costs by temperature



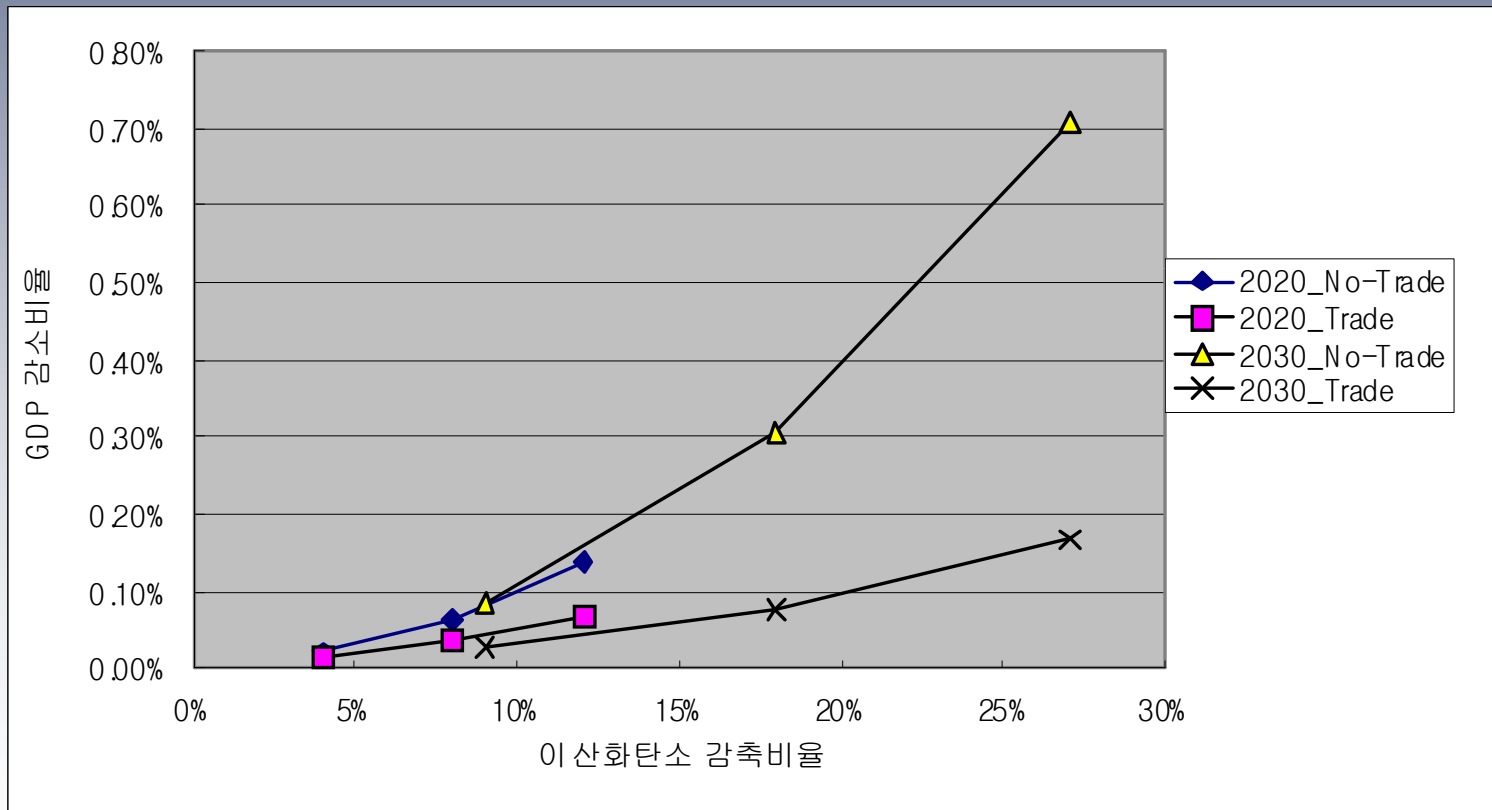
# Climate change damage





# CO<sub>2</sub> mitigation cost: CGE model result : GDP loss

GDP loss by scenario (BAU %)



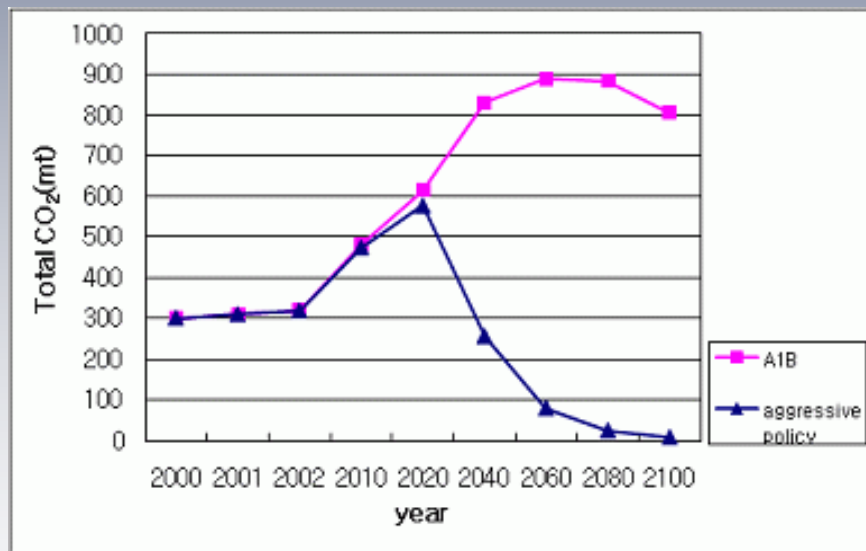
# Integrated assessment using PAGE model

- Climate change damage function
- CO<sub>2</sub> control cost curve
- Scenarios: A1B, Aggressive policy (450ppm)

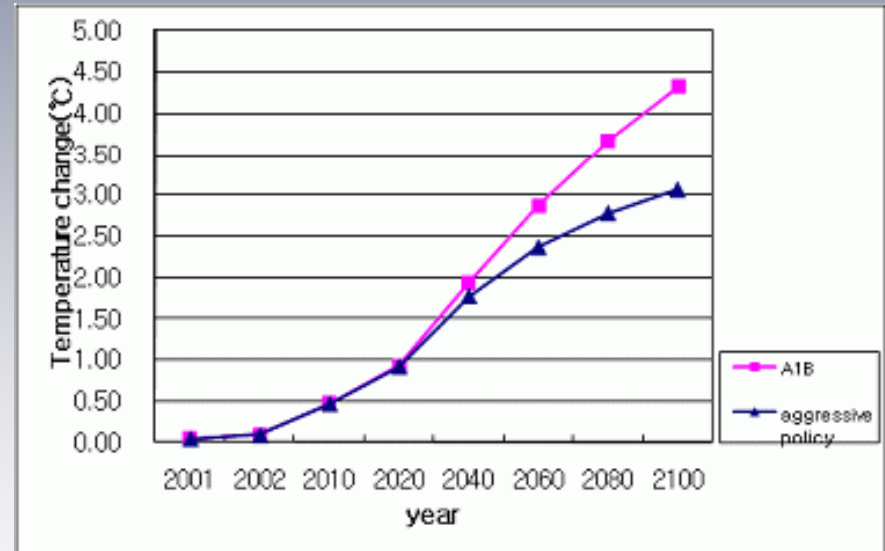
# PAGE Model result

## Climate change damage and GHG mitigation cost

A1B  
450 ppm stabilization scenario



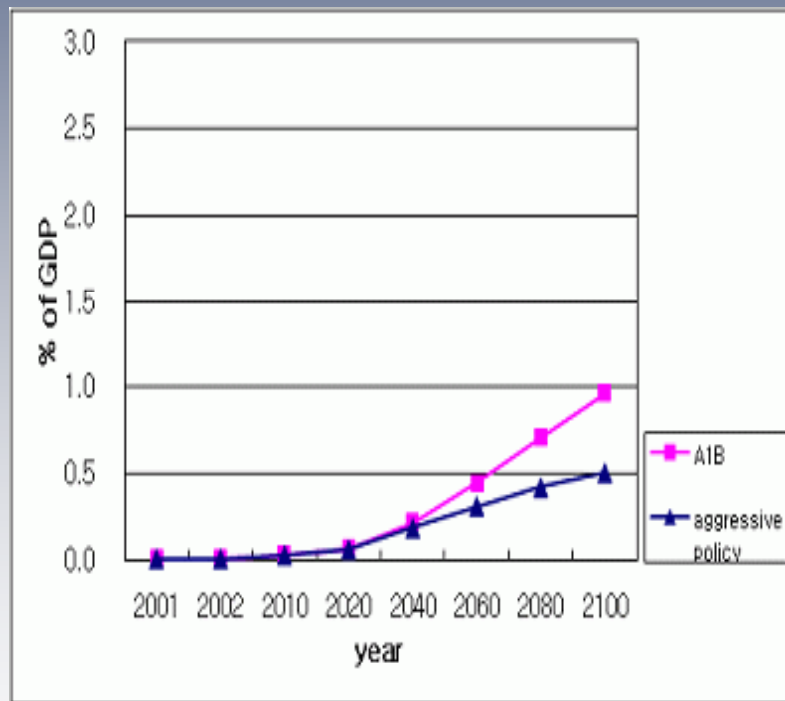
CO<sub>2</sub> emission in Korea



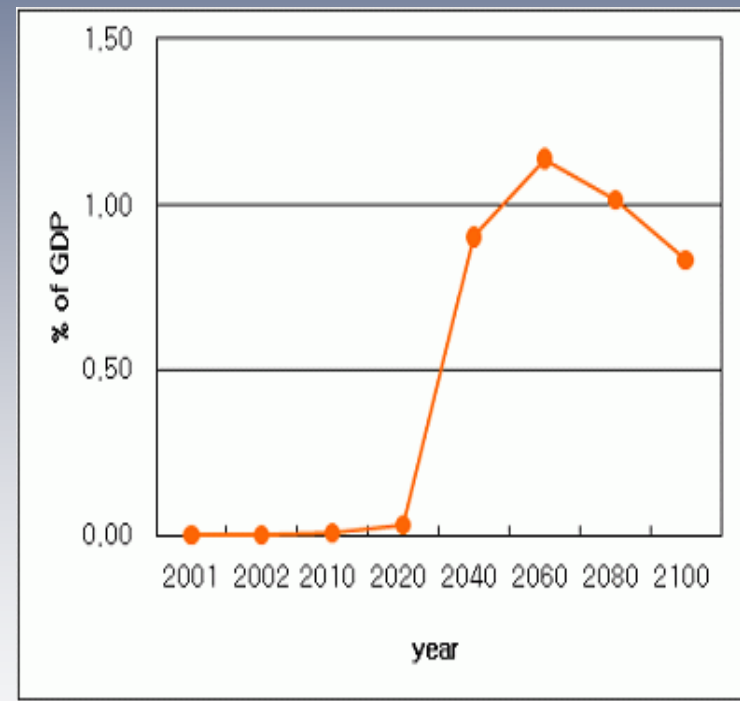
Temperature change

# PAGE Model result

## Climate change damage and GHG mitigation cost



Climate change damage

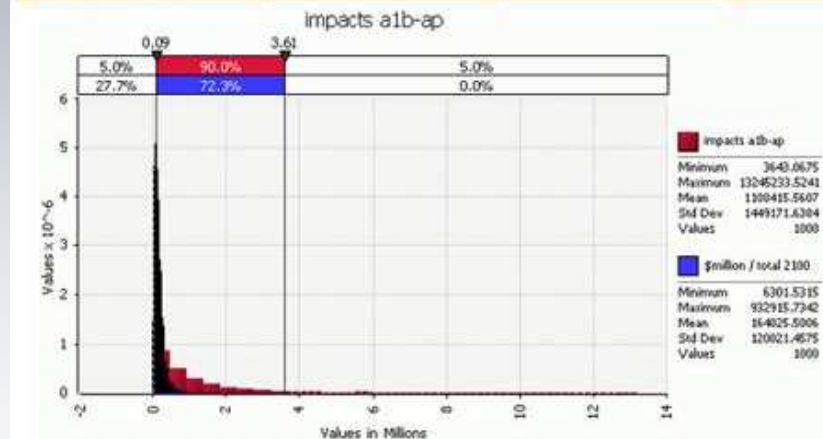


GHG mitigation cost

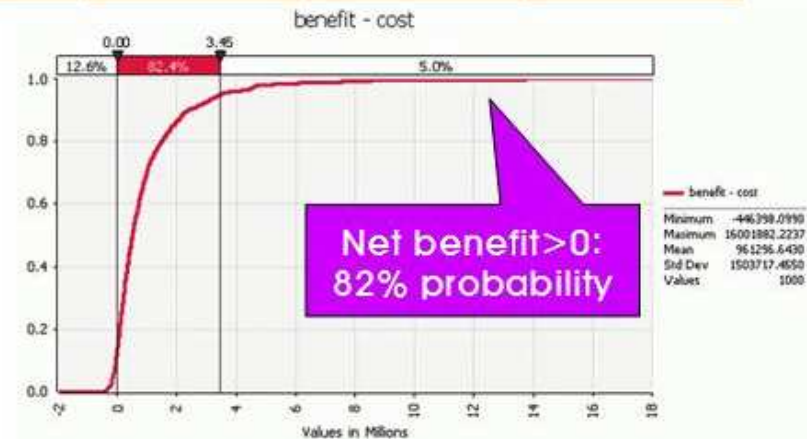
# PAGE Model result

## Pdf of cumulative climate change damage and GHG mitigation

scenario	Cumulative climate change damage cost (million\$)			Cumulative GHG mitigation cost (million\$)		
	5% percentile	mean	95% percentile	5% percentile	mean	95% percentile
A1B	– 33,169	819,408	9,409,995			
Aggressive Policy	– 20,059	448,259	434,433	3,056	163,506	696,247



Pdf of damage & control cost



Pdf of net benefit

# '10 Economic analysis of climate change II

- Scenarios
- Impacts analysis sectors
  - Food
  - Ecosystem
  - Human health
  - Coastal area
  - Water resource
- PAGE2002 -> PAGE09 updates





# National Climate Change Adaptation Master Plan

## Progress of National Climate Change Adaptation Master Plan

- Low Carbon, Green Growth Law enforced
- Strategy for drafting the National Climate Change Adaptation Master Plan established (17/5/2010)
- The working-level meeting of ministries held (4/6/2010)
- The expert meetings for each sector held (8~16/6/2010)
- The climate change adaptation expert symposium and public hearing held (7/7/2010)
- Consultation sessions with stakeholders held (21/7~20/8/2010)
- Plan reported to the Cabinet and confirmed (9/2010)



▲ Public Hearing  
(7/7/2010)



▲ Working-level Meeting of  
Ministries (4/6/2010)

# National Climate Change Adaptation Master Plan

## - Vision and Sectors



Establishment of a Safe Society & Support for Green Growth through Climate Change Adaptation

### Sectoral Adaptation Plans

#### Health

Protect people from heat waves & air pollution

#### Disaster

Minimize damage through the consolidation of disaster prevention foundation

#### Agriculture

Switch to adaptation based agricultural system & create a new opportunity

#### Forestry

Improve forestry health & reduce forestry disaster

#### Coastal/Marine Resources

Respond to sea-level rise & Secure stable marine resources

#### Water Resources

Build secure water management system from flood and drought

#### Biodiversity

Secure biodiversity through restoration and protection

### Adaptation Based Plans

#### Climate Change Monitoring and Prediction

Provide foundation data & minimize uncertainty

#### Adaptation Industry/Energy

Find new and promising businesses for climate change adaptation

#### Education, PR & International Cooperation

Enhance domestic and international communication on adaptation

# Korea Adaptation Center for Climate Change (KACCC)

- Functions

- Support national climate change adaptation policies
- Develop climate change adaptation strategies, implement schemes and measures
- Carry out research regarding the risk assessment of climate change
- Establish networks for domestic and international collaborations
- Support domestic, regional and global adaptation negotiations
- Share information and raise public awareness

- Organization



# THANK YOU



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