

A Road Towards Happier and Safer Korea

2017.9.11



Ministry of Environment

Environmental Cooperation Division

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Outline

- I . **Impacts of Climate Change on Korea**
- II . **Climate Change Adaptation Policy**
- III . **National Framework for Climate Change Adaptation**



I

II

III

Impacts of Climate Change on Korea

I . Impacts of Climate Change on Korea

Observation of Climate Change in Korea

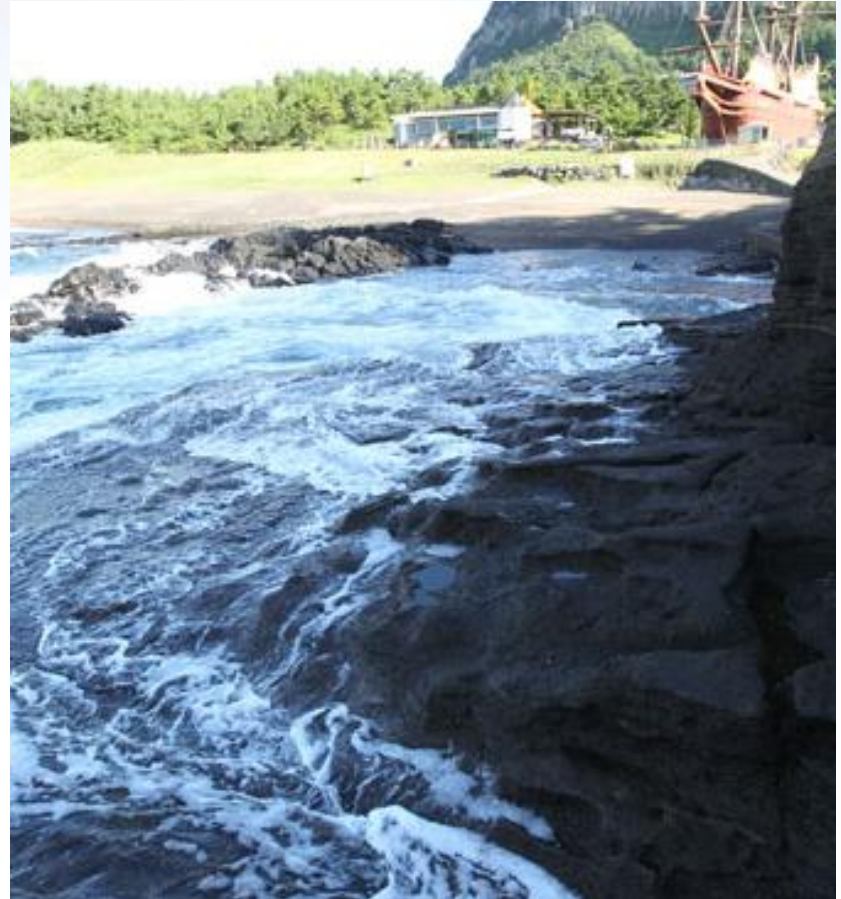
- **Evident changes in climate patterns**
 - Temperature: annual average/max/min
temperature increased in the recent 10 years
(2001-2010) compared to the past 10 years
(1971-1980)
 - Precipitation: more rains in summer, less
rains in spring and fall in most regions
(based on the average of recent 30 years)



I . Impacts of Climate Change on Korea

Observation of Climate Change in Korea

- **Rising sea water temperature and sea level faster than global average**
 - Sea water temperature in Korea increased by 1.19°C during the past 46 years (1968-2013) while global sea surface temperature increased by 0.37°C (NIFS, 2014)
 - Rate of sea level rise was 2.64mm/yr during the past 30 years (1971-2010) while global average was 2.00mm (KHOA, 2014)



I . Impacts of Climate Change on Korea

Observation of Climate Change in Korea

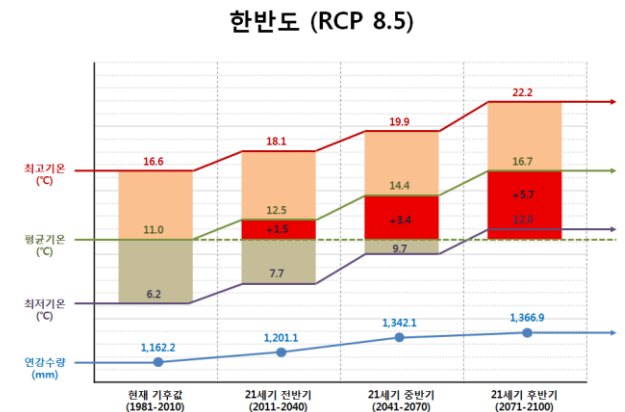
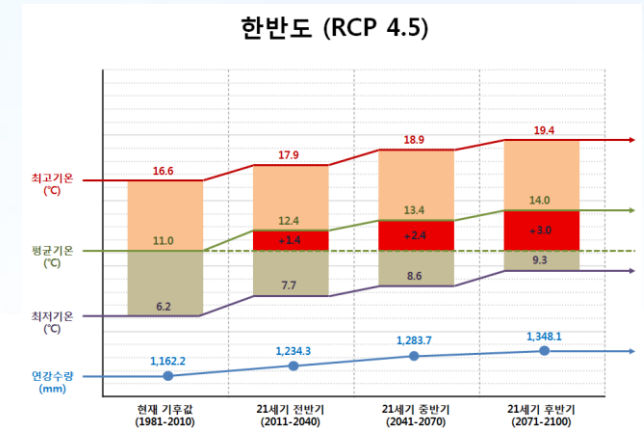
- **More extreme weather events and deepening regional variations**
 - Increasing numbers of days with heat waves and “tropical nights” (i.e. lowest temperature of the day at 25°C or higher)
 - Increasing numbers of days with heavy rain (i.e. more than 80mm of rain within a day): 1.68 days (1970s) → 2.62 days (2000s)
 - More frequent cold waves in recent 10 years despite average temperature rise



I . Impacts of Climate Change on Korea

Prospects of Climate Change in Korea

- Temperature will continue to rise.
 - RCP 4.5 (with moderate mitigation)
 - Average temperature: 3.0°C ↑
 - Precipitation: 1,348.1mm (16.0% ↑)
 - More extreme climate and weather events: More heat waves (5.8 days ↑ per year), increased intensity of rainfall
 - RCP 8.5 (BAU)
 - Average temperature: 5.7°C ↑
 - Heat waves: 22.9 days ↑ per year
 - Tropical nights: 34.4 days ↑ per year



Source: KMO (2012) Korea Climate Change Assessment Report

present (1981-2010) vs. future (2071-2100)

I . Impacts of Climate Change on Korea

Climate Change Impacts in Korea

- **[Water]** Droughts in wider area and floods due to heavy rainfall → damages ↑
- **[Ecosystem]** Changes in plant phenological trends, changes in distribution and composition of flora and fauna, more disturbances due to pest and harmful species
- **[Forest]** Changes in tree species (rapid loss of endemic species), more landslides due to heavy rainfall, more disturbances due to pest outbreaks
- **[Agriculture & Livestock]** Increased vulnerability, adverse effects on growth and cultivation, more economic damages in food sector

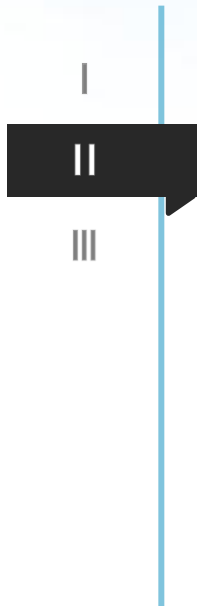


I . Impacts of Climate Change on Korea

Climate Change Impacts in Korea

- **[Oceans & Fisheries]** Changes in species composition and habitat range, hazardous marine life and venomous creatures due to rising sea temperatures, loss of biodiversity due to ocean acidification
- **[Industry & Energy]** Changes in consumption patterns, increased demands for electricity in summer, damages to infrastructure due to extreme weather events
- **[Health]** More deaths from heat waves, more infectious diseases transmitted by insects and rodents





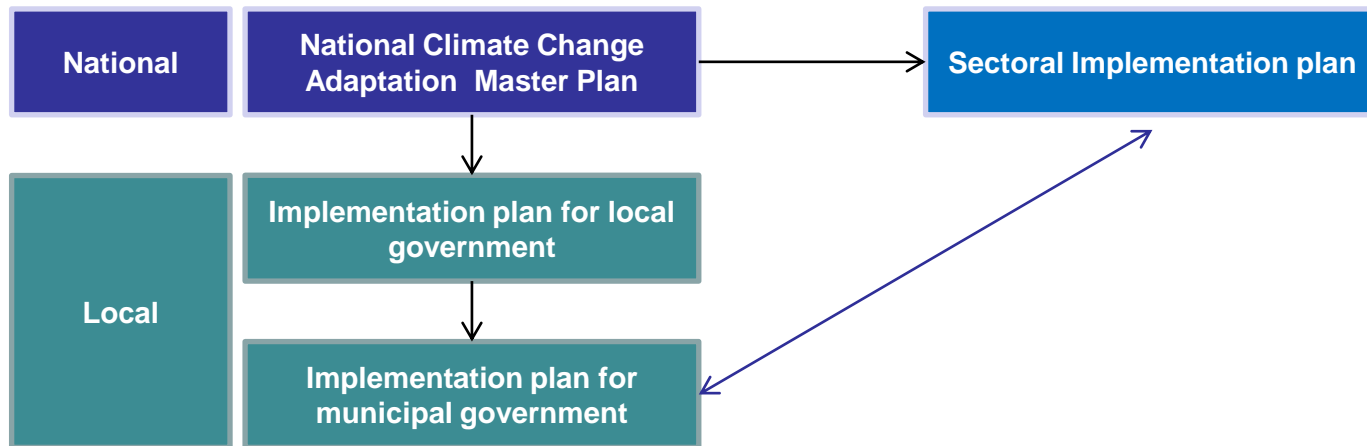
Climate Change Adaptation Policy

II. Climate Change Adaptation Policy

Legal Foundation

- According to the Clause 4, Article 48 of the Framework Act on Low Carbon, Green Growth and the Article 38 of its Enforcement Ordinance.

“The Government shall exert itself preferentially for preventive management to reduce damage that may be caused by climate change and shall establish and implement countermeasures for mitigating impacts of climate change or for coping with health and natural disasters, as prescribed by Presidential Decree.”

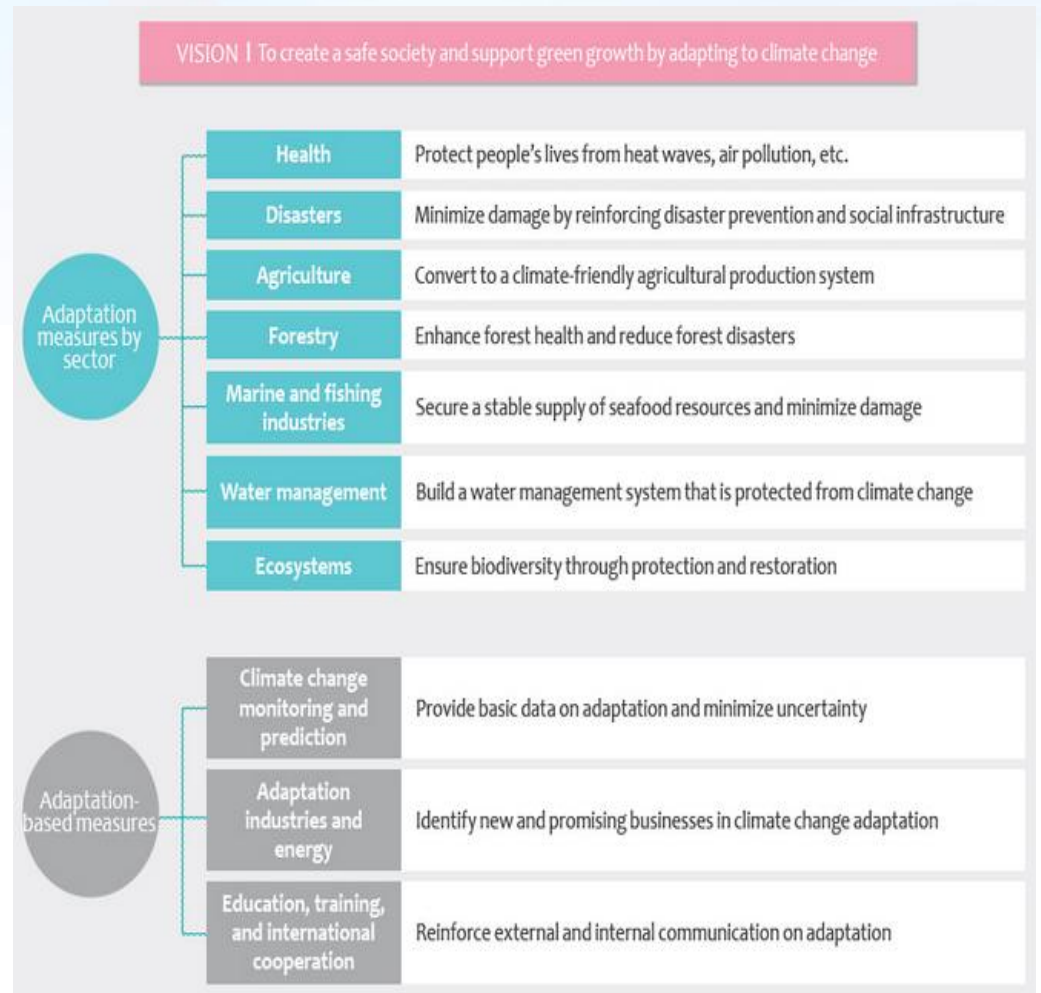


Climate Change Adaptation National Plan System

II. Climate Change Adaptation Policy

The 1st National Climate Change Adaptation Master Plan (2011-15)

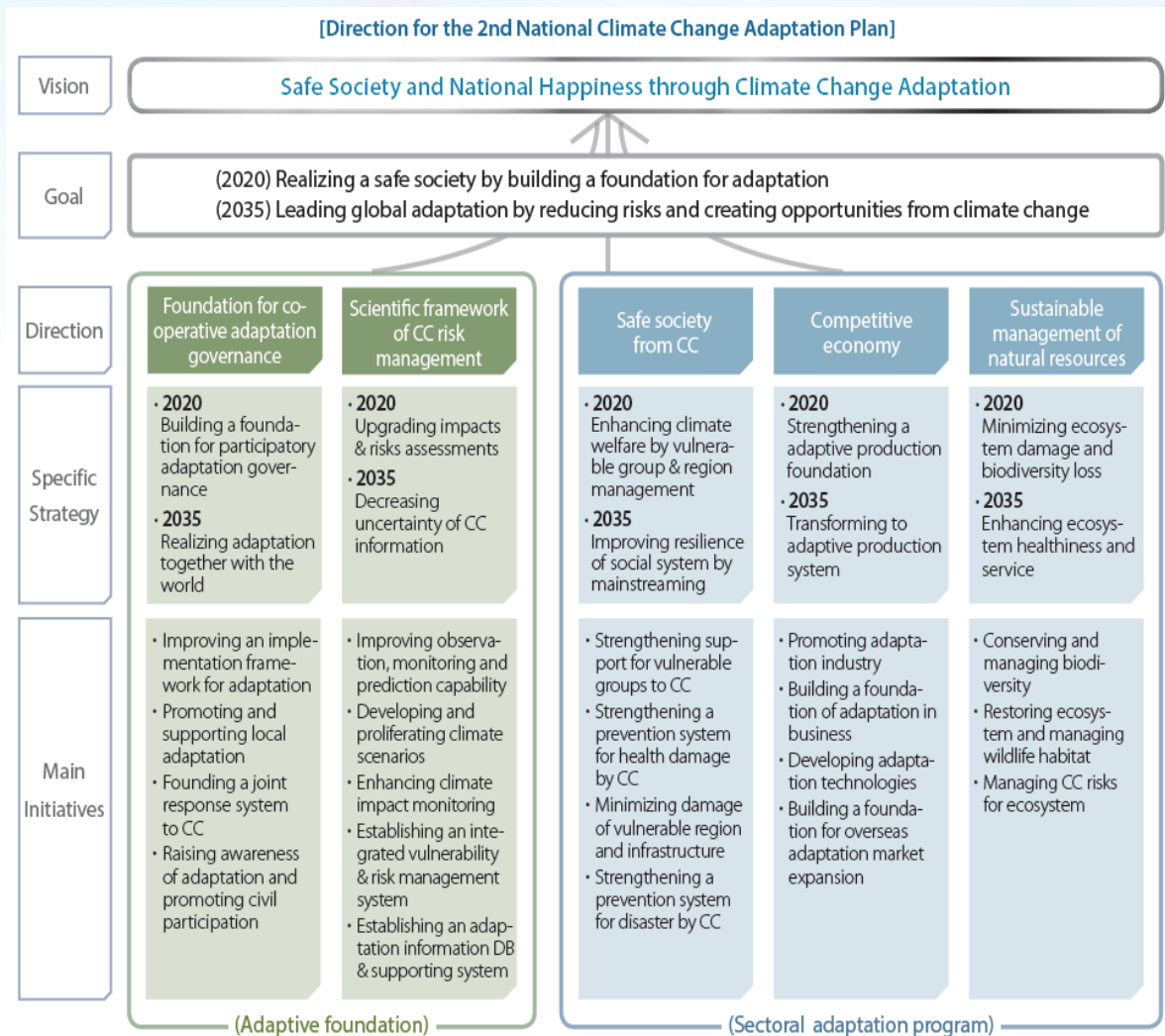
- First master plan published in December 2010
 - A comprehensive national adaptation plan with vision and suggestions for national adaptation policy
 - Addresses 2 areas in 10 sectors with 87 measures
 - 13 ministries including Ministry of Environment are involved
- Revision of the 1st Plan in December 2012
 - Outcomes of RCP Scenarios were applied
 - Addresses 9 areas with 67 measures



II. Climate Change Adaptation Policy

The 2nd National Climate Change Adaptation Master Plan (2016-20)

- First master plan published in December 2015
 - 20 Ministries including Ministry of Environment
 - Vision: Safe society and national happiness through climate change adaptation
 - 5 years short and 20 years medium-long term goals
 - 5 direction-Specific goals, 83 measures





I

II

III

National Framework for Climate Change Adaptation

III-1. Climate Change Adaptation Research

Assessment of Climate Change, Impact and Adaptation in Korea

The progress of Korean Climate Change Assessment Report

1st National Climate Change Assessment Report publishing plan established

Research to publish the climate change assessment report (Literature survey and analysis)

2nd National Climate Change Assessment Report publishing plan established

Research to publish the climate change assessment report (Literature survey and analysis)

Expert review for draft report, and revision

2009

2010

2011

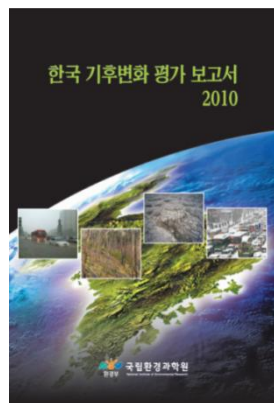
2012

2013

2014

2015

『Korean Climate Change Assessment Report 2010』



- Contents
 - Part 1: Observation and prediction of climate change (6 chap.)
 - Part 2: Impacts, adaptation and vulnerability(8 chap.)
- Cited literature
 - Part 1: 1,003 Part 2: 732
- Participated author
 - Part 1: lead 12, contribute 27, review 7
 - Part 2: lead 7, contribute 25, review 34

『Korean Climate Change Assessment Report 2014』

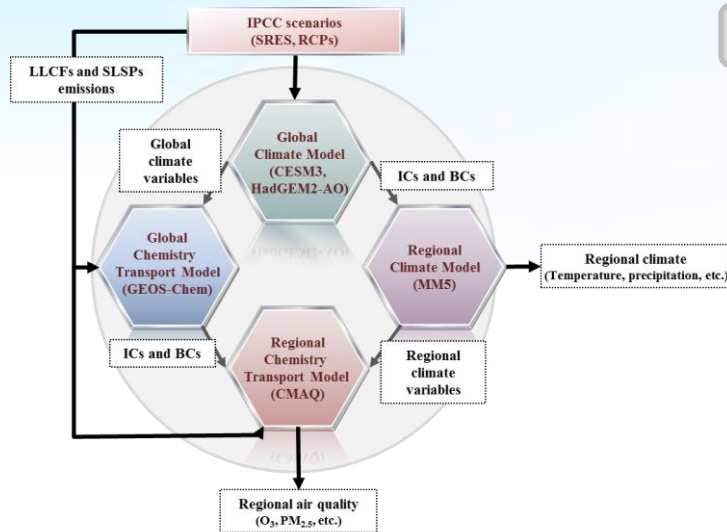


- Contents
 - Part 1: The physical science basis (10 chap.)
 - Part 2: Climate change impact and adaptation (10 chap.)
- Cited literature
 - Part 1: ca 1,000 Part 2: ca 1,500
- Participated author
 - Part 1: lead 13, contribute 42, review 22
 - Part 2: lead 10, contribute 29, review 39

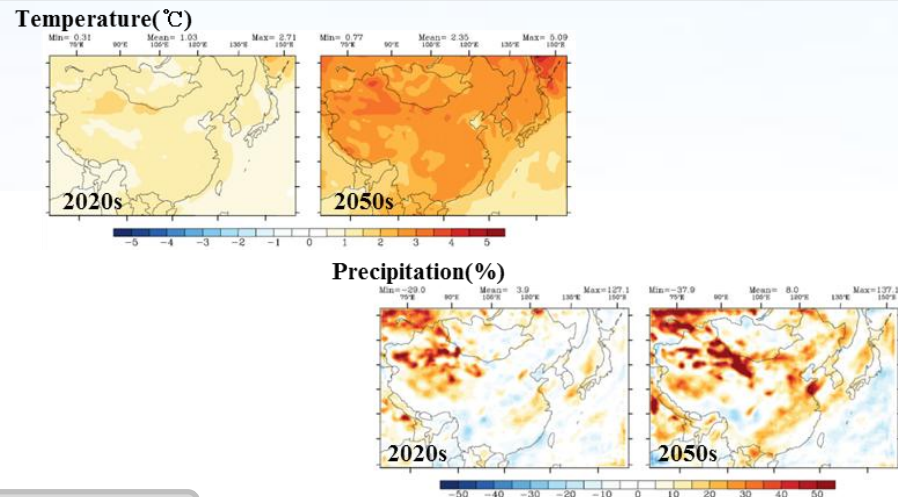
III-1. Climate Change Adaptation Research

Predictions of Climate Change and Its Impacts

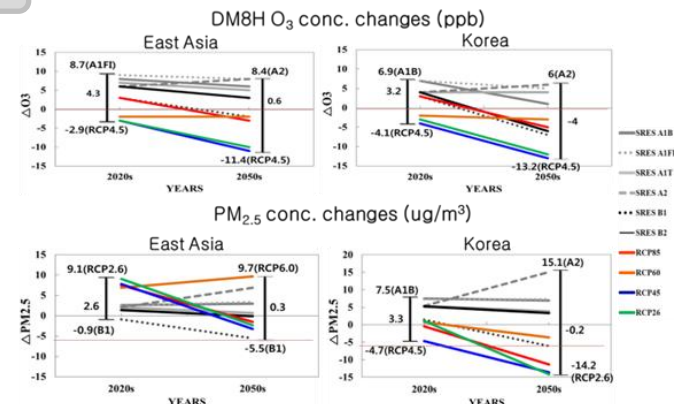
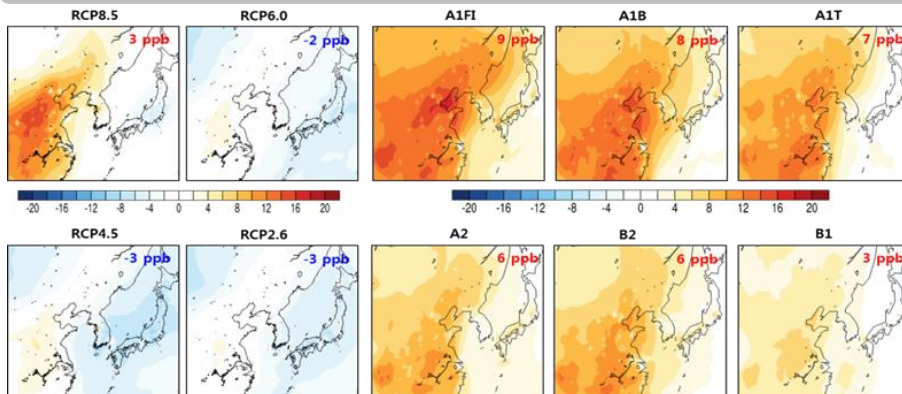
Prediction of Climate & Air Quality Changes under IPCC Scenarios



Spatial distribution of temperature and precipitation change for RCP8.5



Spatial distribution of DM8H O₃ conc. changes for 2020s



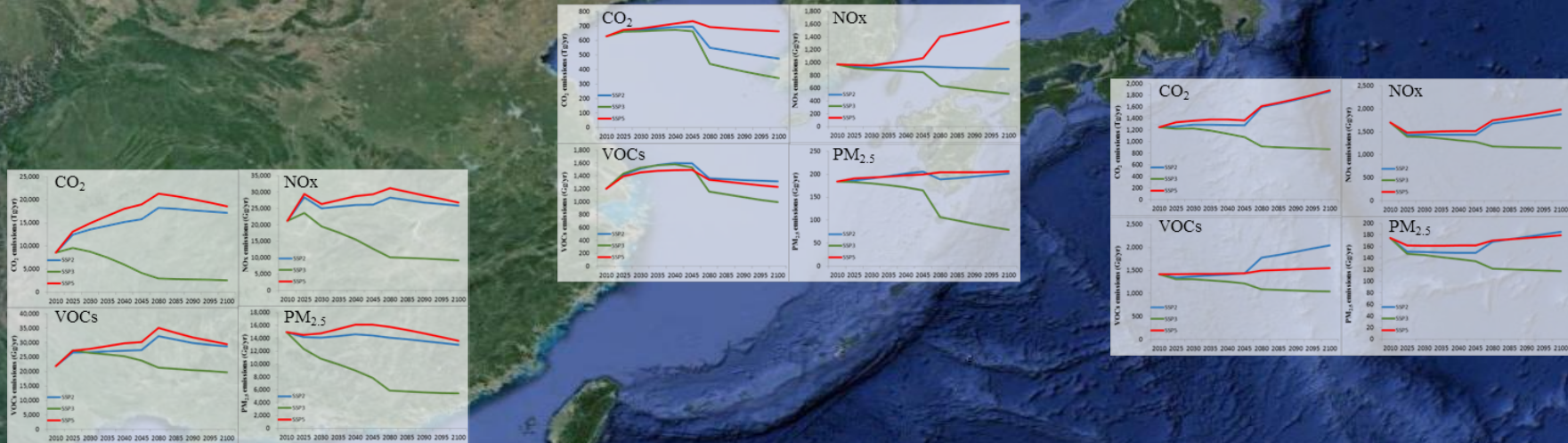
II-2. Climate Change Research

Predictions of Climate Change and Its Impacts

New Scenarios specified in Northeast-Asia

- A future emission scenarios for S. Korea, China and Japan was developed in Mar. 2015 with NIER
- The scenarios reflect current status and future plans on national-oriented-specific socio-economic situation, environmental regulations and climate mitigation programs, and SSPs(Shared Socioeconomic Pathways)
- The scenarios include LLCPs(CO₂, CH₄, N₂O, etc.) and SLCPs(NO_x, VOCs, SO₂, PM, etc.) emissions
- MESSAGE was adopted for China and AIM was adopted for S. Korea and Japan

• Participants:

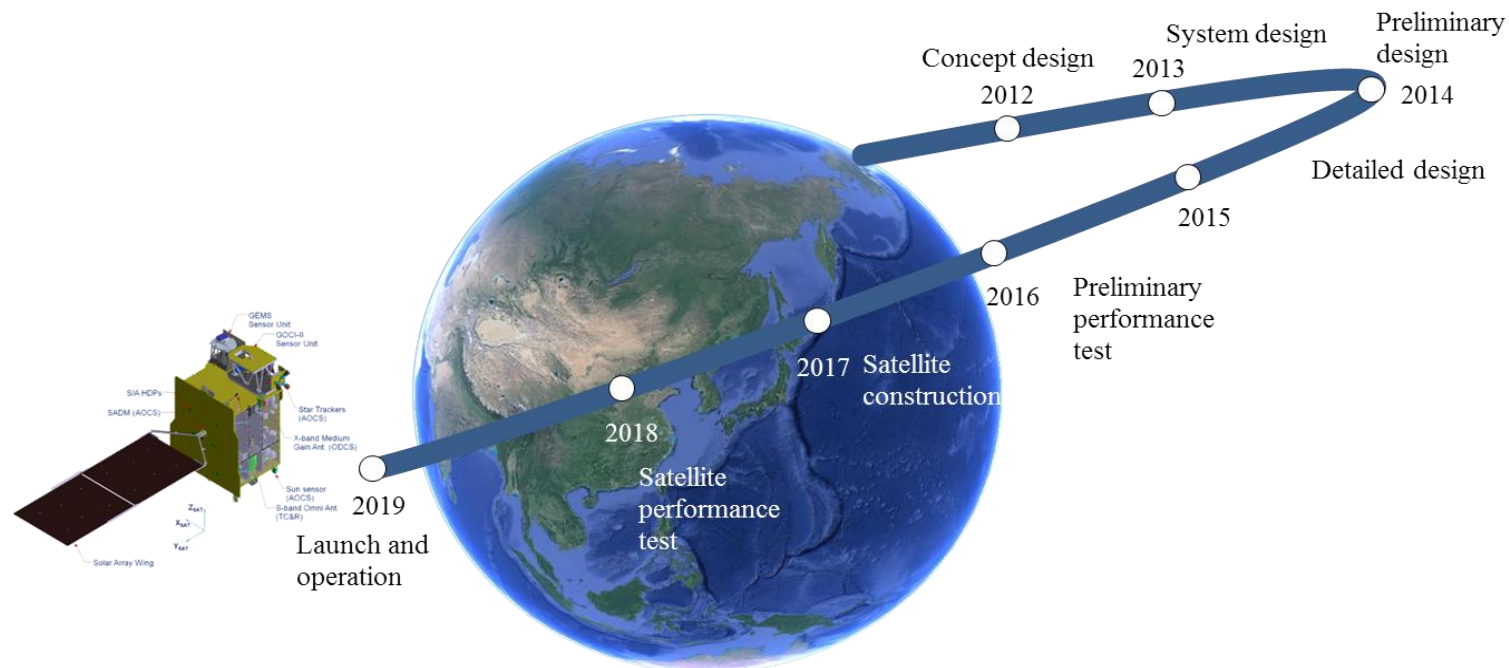


III-1. Climate Change Adaptation Research

Climate Change Monitoring

Progress of Geostationary Environment Monitoring Satellite

- National Institute of Environmental Research (NIER), Ministry of Environment in Korea is planning **GEMS** (Geostationary Environment Monitoring Spectrometer) program to be launched in 2019 onboard a **GEO-KOMPSAT-2B** (GEOstationary KOrea Multi-Purpose SATellite 2B) which is supposed to be the successive mission of COMS (Communication, Ocean and Meteorological Satellite)
- It is essential to monitor air pollution (**SLPCs: O₃, HCHO, Aerosol**) with measurements of meteorological and oceanic variables for better understanding of climate change and atmospheric environment



III-1. Climate Change Adaptation Research

Development of Integrated Model for Climate Change Impact and Vulnerability Assessment

“Model Of in Tegrated Impact and Vulnerability Evaluation of climate change” (MOTIVE)

- **MOTIVE**; the model for reflecting Korean circumstance to be utilized for designing 'science-based adaptation strategies' and considering the interaction of the impact and vulnerability of climate change between different sectors

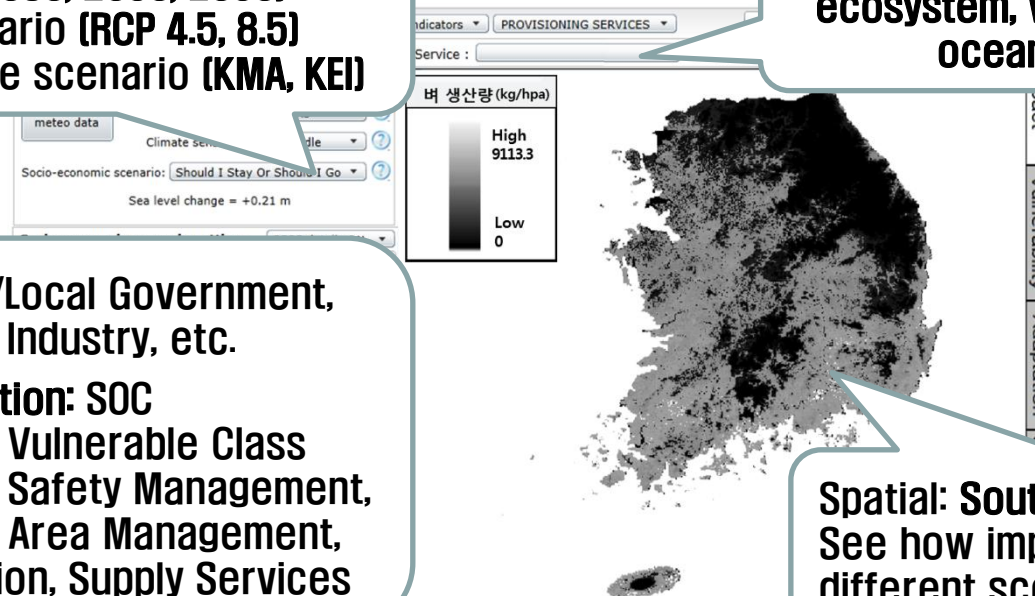
Select your:

- Time period (2030, 2050, 2080)
- Emission scenario (RCP 4.5, 8.5)
- Climate change scenario (KMA, KEI)

User: Central/Local Government, Researchers, Industry, etc.

Policy Application: SOC Management, Vulnerable Class Management, Safety Management, Conservation Area Management, Food Production, Supply Services

Sector: health, forest, agriculture, ecosystem, water management, ocean and fishery



Spatial: South Korea 1km x 1km
See how impact change for different scenarios

III-2. Climate Change Adaptation Supporting Institution

Establishment of Korea Adaptation Center for Climate Change

Korea Adaptation Center for Climate Change

- KACCC was established on July 1, 2009, based on MOE Instruction No. 850
- The items on the operation of KACCC was legalized by “the Clean Air Conservation Act” (revised on May, 2012)
- The center collaborates closely with the Ministry of Environment

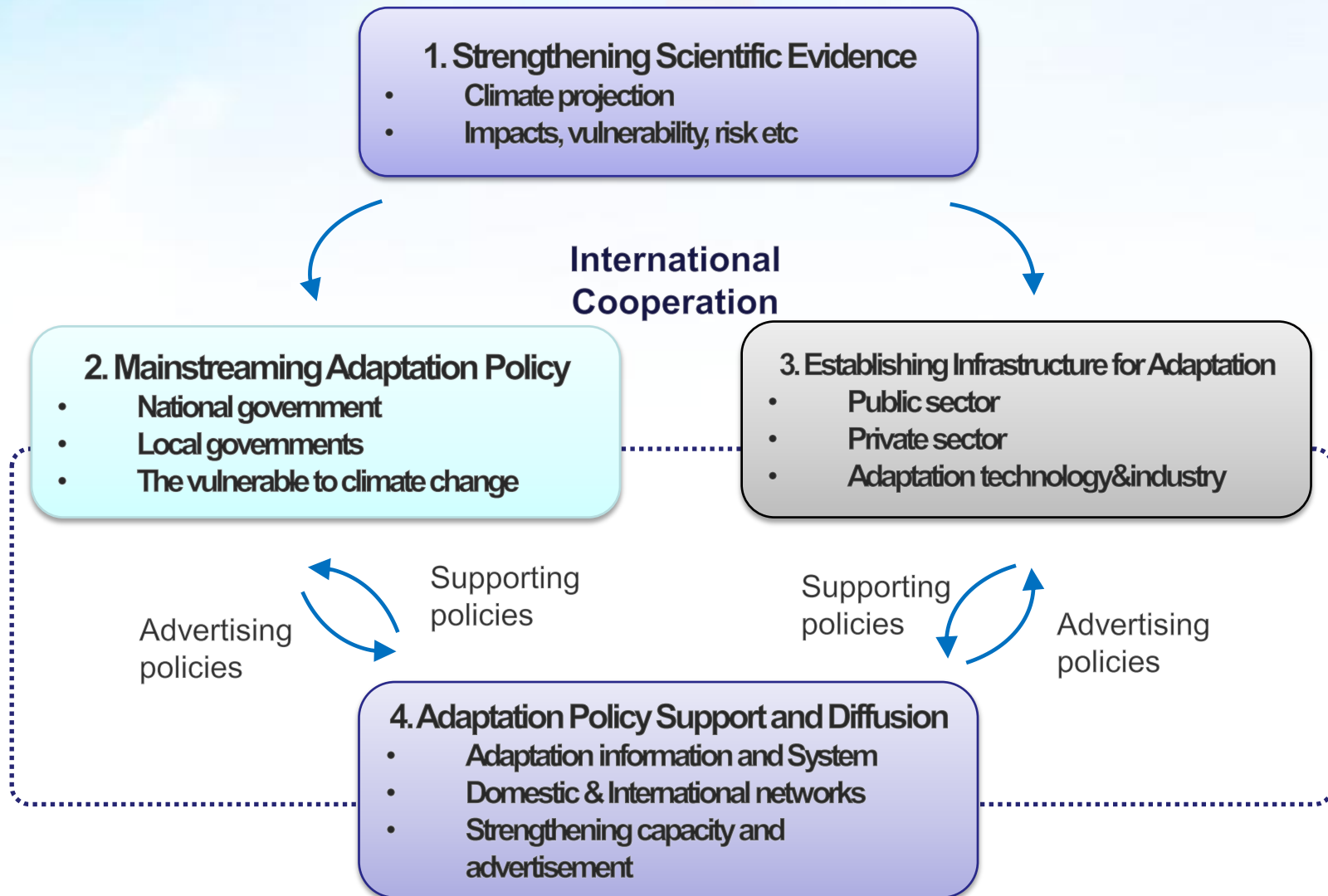


Main roles of KACCC

- Support nationwide climate change adaptation policies development and implementation
- Establish and manage global and regional climate change adaptation networks
- Develop climate change vulnerability and risk assessment frameworks and tools
- Raise public awareness of climate change adaptation

III-2. Climate Change Adaptation Supporting Institution

Adaptation Supporting Framework by KACCC





Thank you for your attention