



# Response to Climate Change : Korea's Perspective

# Contents

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**1. Climate Change Risks in Korea**

**2. Korea's efforts to tackle climate change**

**3. National Climate Change Adaptation Plan  
in Korea**

**4. Conclusion and Suggestion**



I

## Climate Change Risks in Korea

II

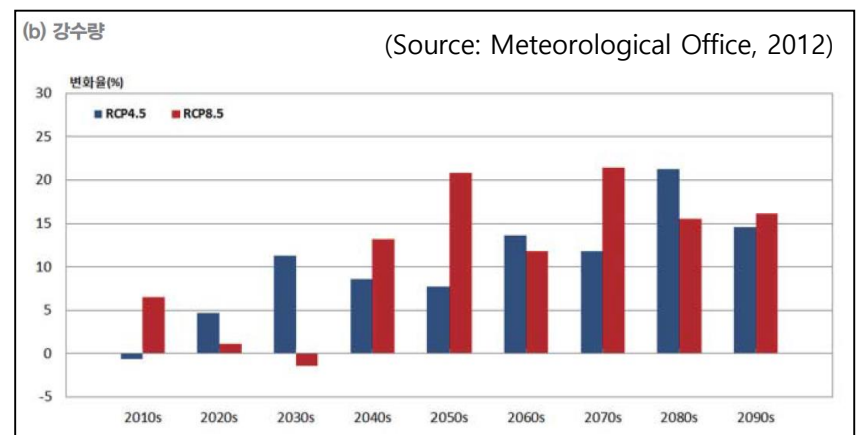
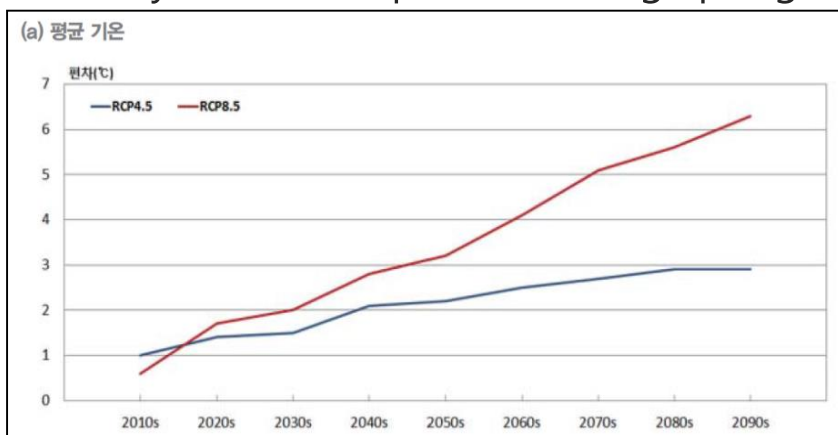
III

IV

# I. Climate Change Risks in Korea

## 1. Prospects of Climate Change in Korea (End of the 21th Century, RCP 8.5)

- (Climate) 3.2°C increases by 2050s, Season length changes
  - The subtropical zone is projected to expand from the South Coast to the whole country except inland areas
  - Longer summer season, and winter of Jeju and Ulleung islands will be disappeared
- (Rainfall) Increase in rainfall by 15.6% and precipitation intensity by 13% by 2050s, Increase in localized torrential downpours
  - Increase rainfall in late spring and early summer than summer, damages due to heavy rain are expected during spring and autumn.



<Temporal variation in climate over Korea peninsula in 21<sup>st</sup> century (left: climate, right: rainfall) >

# I. Climate Change Risks in Korea

## 2. Major Risks

(Source: KEI, 2014)

- (Health) Increase in death, disease and infectious disease due to temperature increase, heat wave and disasters
  - Heat wave death toll : ('30s) 4,820 → ('50s) 11,673
  - Disease burden(KRW) due to heat wave and abnormal temperature : ('10s) 53 billion → ('20s) 103.9 billion → ('50s) 1 trillion 437.7 billion
- (Water) Rainfall changes, water management degeneration due to increase in flood and droughts



(Source: YonhapNews)

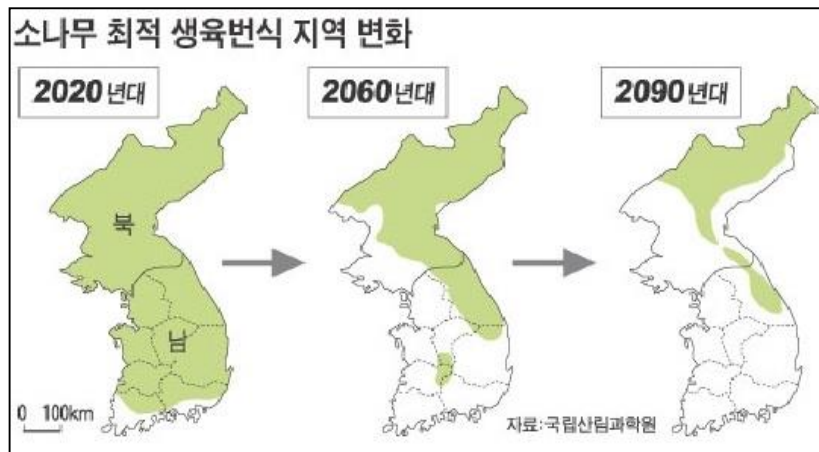
# I. Climate Change Risks in Korea

## 2. Major Risks

(Source: KEI, 2014)

- (Forest/Ecosystem) Biodiversity decline, aggravation of habitat, increase in pests and forest fire
  - Rapid loss of endemic species, increase in survival rate of pest, etc
- (Land/Coast) Urban heat island due to temperature increase and disasters, SOC function degradation, coast erosion, increase in flood vulnerability
  - Due to the concentrated population and infrastructure density, climate change impacts and damages will be greater

### <Changes in optimum Pine growth regions>



(Source: KFRI)

# I . Climate Change Risks in Korea

## 2. Major Risks

(Source: KEI, 2014)

- (Agriculture and Livestock) Increase in vulnerability of agricultural and livestock systems, Adverse effects on livestock growth and cultivation, Increase in agricultural waste
  - Economic damage from food sector(KRW): ('50s) 296.4 billion→ ('00s) 613.5 billion
  - 60% of agricultural infrastructure will be aged
- (Marine) Change in species and habitat, increase in pests and diseases, destruction of the marine system
  - Hazardous marine life and venomous creatures due to rising sea temperatures; Change in ecosystem, food chain and biological diversity due to ocean acidification

I

II

III

IV

## Korea's Effort to tackle Climate Change



## II. Korea's Effort to tackle Climate Change

**Sustainable Low-Carbon Growth  
And Climate Change Adaption**

*Creating high value addition,  
new markets and jobs*

**Institutionalize  
implementation  
system**

**Introduce  
ETS**

**Energy  
efficiency  
performance**

**Financial  
and  
fiscal support**

I

II

III

IV

## National Climate Change Adaptation Plan in Korea

- III -1 1<sup>st</sup> National Climate Change Adaptation Plan
- III -2 2<sup>nd</sup> National Climate Change Adaptation Plan
- III -3 Monitoring structure for implementing 2nd National Climate Change Adaptation Plan

# III. National Climate Change Adaptation Plan in Korea

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## 1. Current Status of National Climate Change Adaptation in Korea

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- Established 2 national adaptation plans (5-year rolling plan)
  - 1<sup>st</sup> National Climate Change Adaptation Plans ('10-'15)
  - 2<sup>nd</sup> National Climate Change Adaptation Plans ('16-'20)
- Developed their sectoral and local implementation plans
  - Completed sectoral implementation plans for the 1<sup>st</sup> and 2<sup>nd</sup> Adaptation Plans
  - Completed regional & municipal implementation plans for the 1<sup>st</sup> Adaptation Plans

# III. National Climate Change Adaptation Plan in Korea

## 1. Current Status of National Climate Change Adaptation in Korea

※ Comparison of the 1<sup>st</sup> and 2<sup>nd</sup> National Adaptation Plans

	1 <sup>st</sup> National Adaptation Plan	2 <sup>nd</sup> National Adaptation Plan
1	Composed of <b>9 sectors</b> and 67 sub-goals	Established <b>the integrated adaptation system</b> with adaptation foundation & culture, and economic · social · environmental aspects
2	Introduced only the <b>need of sectoral adaptation goals</b>	<b>Differentiated short and long-term vision and goals</b> for climate change adaptation at the national level
3	Identified and implemented <b>adaptation measures only</b>	Considered the co-benefit effects of <b>mitigation and adaptation</b> of climate change
4	Gave priority to <b>adaptation measures mainstreamed</b> in evolved ministries	Prepared scientific and needs-based measures <b>based on the results of climate change impacts and risk assessments</b>

# III. National Climate Change Adaptation Plan in Korea

## 1. Current Status of National Climate Change Adaptation in Korea

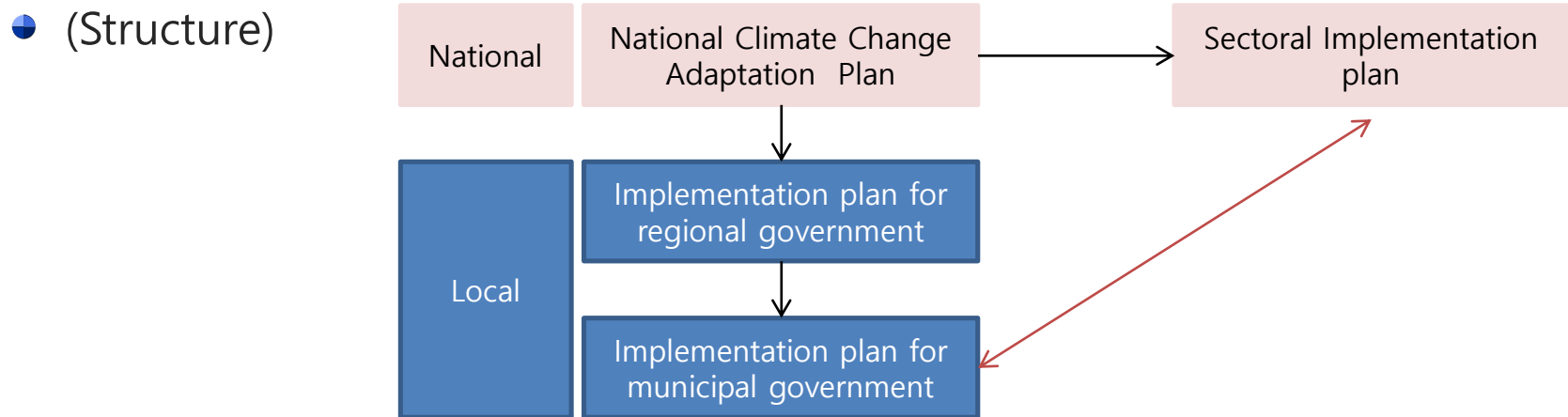
※ Comparison of the 1<sup>st</sup> and 2<sup>nd</sup> National Adaptation Plans

	1 <sup>st</sup> National Adaptation Plan	2 <sup>nd</sup> National Adaptation Plan
5	Suggested sectoral adaptation measures <b>without priority</b>	<b>Set the priority</b> of sectoral adaptation measures and key strategies
6	Secured <b>the correlation with the government keynote and higher-level plans</b>	Secured the consistent direction with the value of policies by <b>setting the adaptation principles</b>
7	<b>Regularly checked</b> the implementation of adaptation measures	<b>Strengthened the Monitoring and Evaluation system</b>

# III-1. 1<sup>st</sup> National Climate Change Adaptation Plan

## 2. Legal Basis and Structure

- (Legal Basis) 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

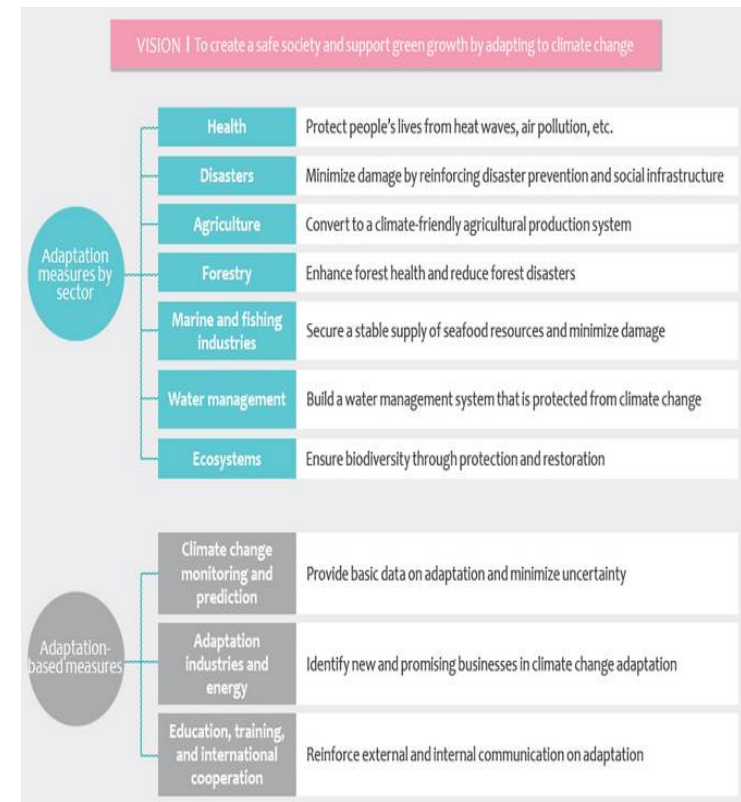


<Climate Change Adaptation Structure>

# III-1. 1<sup>st</sup> National Climate Change Adaptation Plan

## 3. 1<sup>st</sup> National Climate Change Adaptation Plan('11~'15)

- The 1<sup>st</sup> National Climate Change Adaptation Plan (Dec. 2010)
  - (Period) 2011 ~ 2015
  - (Characteristics) As comprehensive national adaption plan, vision and direction of the national adaptation policy is suggested.
  - (System) 2 areas, 10 sectors, 87 sub-goals
  - (Participated Ministries) 13 Ministries including Ministry of Environment
- Revision of the 1<sup>st</sup> Plan (Dec. 2012)
  - Outcomes of RCP Scenario applied
  - 9 sectors, 67 sub-goals



(Resource: related ministries, 2010)

# III-1. 1<sup>st</sup> National Climate Change Adaptation Plan

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## 4. Achievement of the 1<sup>st</sup> Adaptation Plan

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- National Level Climate Change Adaptation Framework
  - Established the direction for the national, local and local adaptation plans
  - Established local and municipal-level adaptation implementation plans
  - Supported local governments to establish/implement adaptation implementation plans
- Scientific basis of climate change adaptation
  - Provided standard and high resolution climate change scenarios, vulnerability maps, and assessment tools for local and municipal governments
- Rise in climate change adaptation awareness and adaptation partnership
  - Promoted PR, education & international cooperation on adaptation



# III-1. 1<sup>st</sup> National Climate Change Adaptation Plan

## 4. Achievement of the 1<sup>st</sup> Adaptation Masterplan (by sector)

Sector	Major Performance
Health	<ul style="list-style-type: none"><li>• Monitoring system on climate change health impacts<ul style="list-style-type: none"><li>- Climate change related diseases DB, etc.,</li></ul></li><li>• Health risk reduction strategies due to abnormal weather<ul style="list-style-type: none"><li>- Develop and supply a relevant manual, introduce what to do to prevent heat wave, etc.,</li></ul></li></ul>
Agriculture and Fisheries	<ul style="list-style-type: none"><li>• Monitoring system, predicted climate change impacts in agricultural and fisheries sectors<ul style="list-style-type: none"><li>- Produce high resolution scenario for agriculture, build fisheries monitoring system, etc.,</li></ul></li><li>• Climate change adaptation resource management, production technology development<ul style="list-style-type: none"><li>- Develop species adapt to climate change, disease diagnosis and prevention for conservation of aquatic resources</li></ul></li></ul>
Water Management	<ul style="list-style-type: none"><li>• Enhance prediction and water monitoring system through water resource monitoring network, aquatic ecology investigation</li><li>• Water resource management for safe water<ul style="list-style-type: none"><li>- Enhance water management system considering climate change, advance river management, etc</li></ul></li><li>• Enhance infrastructure facilities, dimension capability for floods and droughts<ul style="list-style-type: none"><li>- Flood-risk map for national stream, etc.,</li></ul></li></ul>
Natural Disasters	<ul style="list-style-type: none"><li>• Policy targeting high disaster risk areas and facilities vulnerable to natural disasters<ul style="list-style-type: none"><li>- Relevant standards and establish preventive measures, improve ability to predict landslide damages</li></ul></li><li>• Disaster preparedness for urban planning</li></ul>

# III-1. 1<sup>st</sup> National Climate Change Adaptation Plan

## 4. Achievement of the 1<sup>st</sup> Adaptation Masterplan (by sector)

Sectors	Performance
Forest/Ecosystem	<ul style="list-style-type: none"><li>• Long-term ecosystem monitoring<ul style="list-style-type: none"><li>- Research on long-term ecological changes, pilot project on national climate change biological indicators monitoring, etc.,</li></ul></li><li>• Systemic management of biological resources through habitat and species protection</li></ul>
Land/Coast	<ul style="list-style-type: none"><li>• Climate change vulnerability analysis for land, infrastructure<ul style="list-style-type: none"><li>- Guideline for vulnerability analysis, technical research, research development projects</li></ul></li><li>• Improve disaster prevention system</li><li>• Reduction in climate change impacts and enhance adaptive capacity<ul style="list-style-type: none"><li>-Expand green areas for heat island</li></ul></li></ul>
Industry	<ul style="list-style-type: none"><li>• Climate change vulnerability assessment and risk management</li><li>• Enhance adaptive capacity through adaptive technology development<ul style="list-style-type: none"><li>- R&amp;D investment, joint climate change adaptation plans, etc.,</li></ul></li><li>• Climate change adaptation targeting private sectors, adaptation industries<ul style="list-style-type: none"><li>- Extend agricultural insurance products</li></ul></li></ul>

# III-1. 1<sup>st</sup> National Climate Change Adaptation Plan

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## 5. Limitation of the 1<sup>st</sup> Plan

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- Difficulty in making a tangible outcome
  - Absence of sectoral short-term, medium and long-term goals, adaptation priority, and indicators
  - Lack of systematic implementation monitoring and evaluation
  - Limited budget
- Insufficient strategic framework for promoting adaptation
  - Lack of decision supporting tools, experts and scientific foundation
  - Lack of communication among local governments, industries and civil society
  - Lack of alignment among sectoral adaptation measures

# III-2. 2<sup>nd</sup> National Climate Change Adaptation Plan

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## 1. 2<sup>nd</sup> Adaptation Plan

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- Contents

- (Title) The 2<sup>nd</sup> National Climate Change Adaptation Plan (2016~2020)
- (Vision) Safe society, National happiness
- (Period) Based on long-term vision(2035), Five year rolling plan(2016-2020)
- (Participation) 20 ministries

※ Ministries: Ministry of Strategy and Finance, Ministry of Education, Ministry of Science, ICT and Future Planning, Ministry of Foreign Affairs, Ministry of Unification, Ministry of National Defense, Ministry of Government Administration and Home Affairs, Ministry of Culture, Sports and Tourism, Ministry of Agriculture, Food and Rural Affairs, Ministry of Trade, Industry and Energy, Ministry of Health and Welfare, Ministry of Environment, Ministry of Employment and Labor, Ministry of Land, Infrastructure and Transport, Ministry of Oceans and Fisheries, Ministry of Public Safety and Security, Korea Meteorological Administration, Rural Development Administration, Korea Forest Service, Cultural Heritage Administration

## III-2. 2<sup>nd</sup> National Climate Change Adaptation Plan

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### 2. Differentiation from the 1<sup>st</sup> Plan

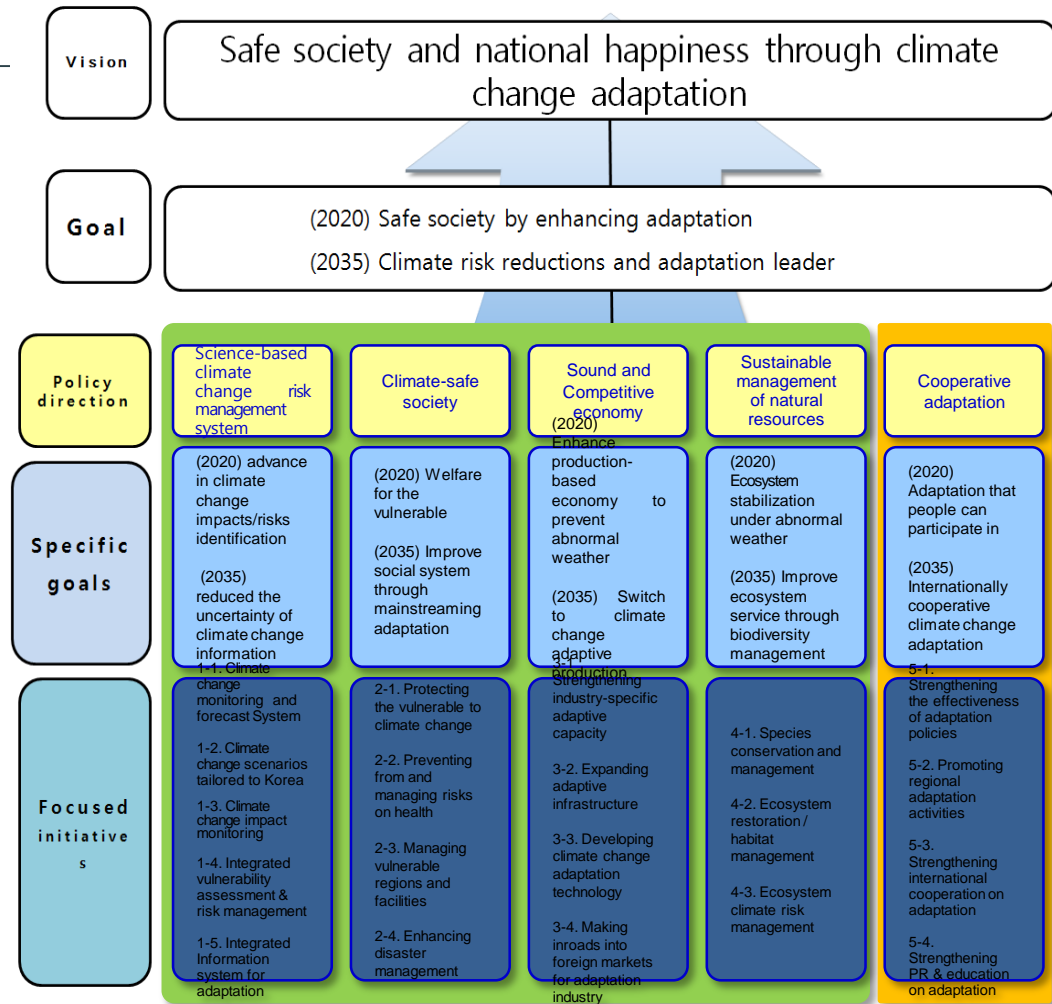
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- Reflected internal and external policy environment changes
  - Continued the initiative & maintained consecutiveness
  - Added newly discovered sectors, and prioritized the existing measures based on risk assessment
  - Explored the co-benefit of climate change mitigation and adaptation
- Established a strategic adaptation framework including short, mid, long-term adaptation visions and goals
  - Established the long-term vision and short/mid term goals
  - Visualized a economic, social and environment virtuous circle through adaptation
- Expanded investment in adaptation technology & international cooperation
  - Promoted adaptation technology and industry
  - Enhanced international partnership on adaptation

# III-2. 2<sup>nd</sup> National Climate Change Adaptation Plan

## 3. Vision/System

- (Vision)
  - Safe society and national happiness through climate change adaptation
- (Goal)
  - 5 years short term, 20 years medium-long term
- (System)
  - 4+1 system
  - 5 directions/specific goals, 20 focused initiatives



## III-2. 2<sup>nd</sup> National Climate Change Adaptation Plan

### 4. Direction and Goals, Focused Initiatives

- Part one : Expanding the knowledge base

Division	Contents
Vision	<b>Science-based climate change risk management system</b>
Specific goal	<ul style="list-style-type: none"><li>• (2020) advance in climate change impacts/risks identification</li><li>• (2035) reduce the uncertainty of climate change information</li></ul>
Planning indicator	<ul style="list-style-type: none"><li>• Accuracy</li><li>• Vulnerability map</li></ul>
Focused initiatives	<ul style="list-style-type: none"><li>1-1. Climate change monitoring and forecast system</li><li>1-2. Climate change scenarios tailored to Korea</li><li>1-3. Climate change impact monitoring</li><li>1-4. Integrated vulnerability assessment &amp; risk management</li><li>1-5. Integrated Information system for adaptation</li></ul>

## III-2. 2<sup>nd</sup> National Climate Change Adaptation Plan

### 4. Direction and Goals, Focused Initiatives

- Part two : Society

Division	Contents
Vision	<b>Climate-safe society</b>
Specific goal	<ul style="list-style-type: none"><li>• (2020) Welfare for the vulnerable</li><li>• (2035) Improve social system through mainstreaming adaptation</li></ul>
Planning indicator	<ul style="list-style-type: none"><li>• Reduce health damage due to abnormal temperature</li><li>• Reduce facility damage due to climate change</li></ul>
Focused initiatives	<ul style="list-style-type: none"><li>2-1. Protecting the vulnerable to climate change</li><li>2-2. Preventing from and managing risks on health</li><li>2-3. Managing vulnerable regions and facilities</li><li>2-4. Enhancing disaster management</li></ul>



## III-2. 2<sup>nd</sup> National Climate Change Adaptation Plan

### 4. Direction and Goals, Focused Initiatives

#### ● Part three : Economy

Division	Contents
Vision	<b>Sound and Competitive economy</b>
Specific goal	<ul style="list-style-type: none"><li>• (2020) Enhance production-based economy to prevent abnormal weather</li><li>• (2035) Switch to climate change adaptive production system</li></ul>
Planning indicator	<ul style="list-style-type: none"><li>• Domestic adaptation industry market share</li></ul>
Focused initiatives	<ul style="list-style-type: none"><li>3-1 Strengthening industry-specific adaptive capacity</li><li>3-2. Expanding adaptive infrastructure</li><li>3-3. Developing climate change adaptation technology</li><li>3-4. Making inroads into foreign markets for adaptation industry</li></ul>

## III-2. 2<sup>nd</sup> National Climate Change Adaptation Plan

### 4. Direction and Goals, Focused Initiatives

#### ● Part four : Environment

Division	Contents
Vision	<b>Sustainable management of natural resources</b>
Specific goal	<ul style="list-style-type: none"><li>• (2020) Ecosystem stabilization under abnormal weather</li><li>• (2035) Improve ecosystem service through biodiversity management</li></ul>
Planning indicator	<ul style="list-style-type: none"><li>• Number of identified biological genetic resources</li><li>• Protected areas</li></ul>
Focused initiatives	<ul style="list-style-type: none"><li>4-1. Species conservation and management</li><li>4-2. Ecosystem restoration / habitat management</li><li>4-3. Ecosystem climate risk management</li></ul>

## III-2. 2<sup>nd</sup> National Climate Change Adaptation Plan

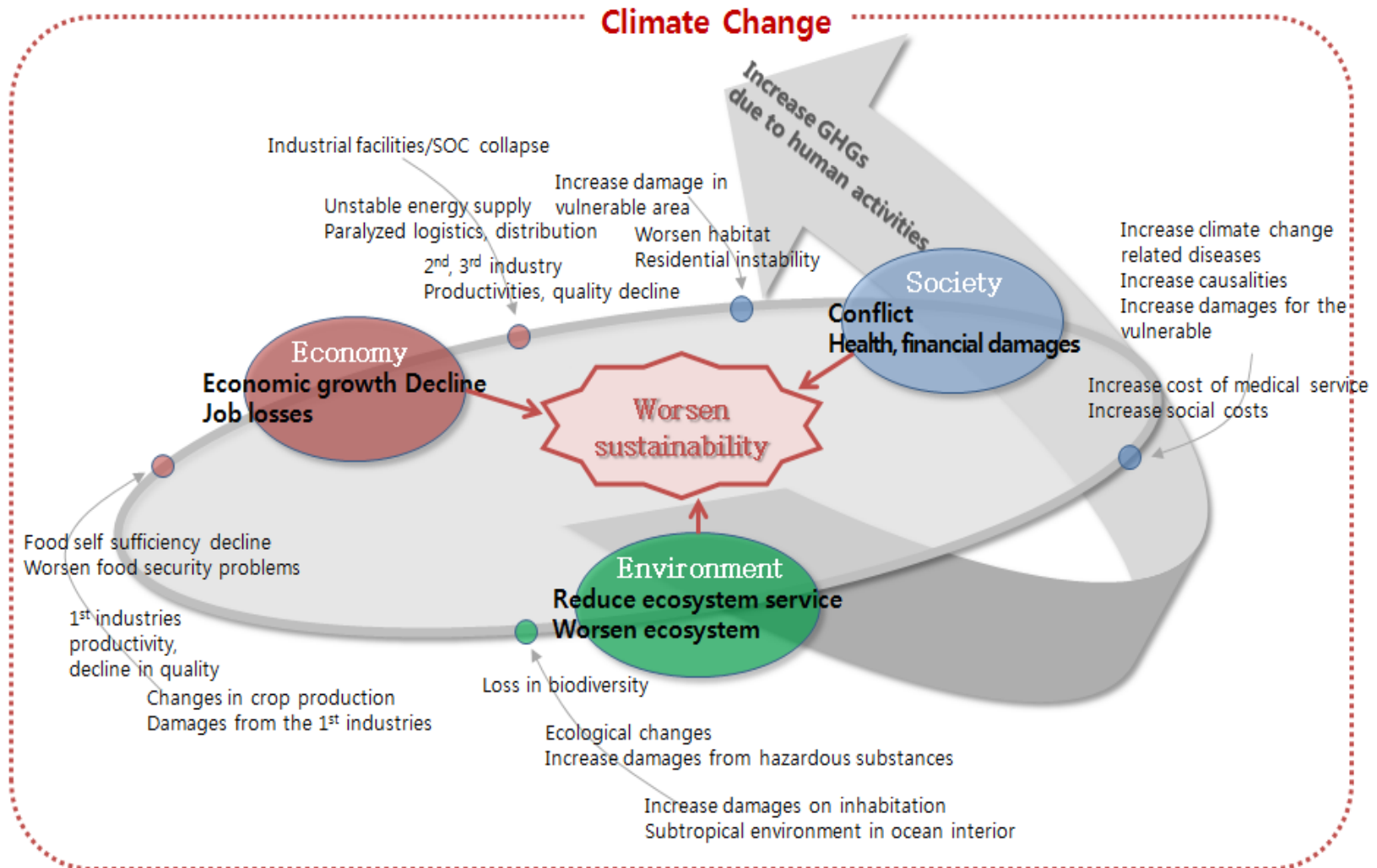
### 4. Direction and Goals, Focused Initiatives

- Part five : Institutional and cultural basis

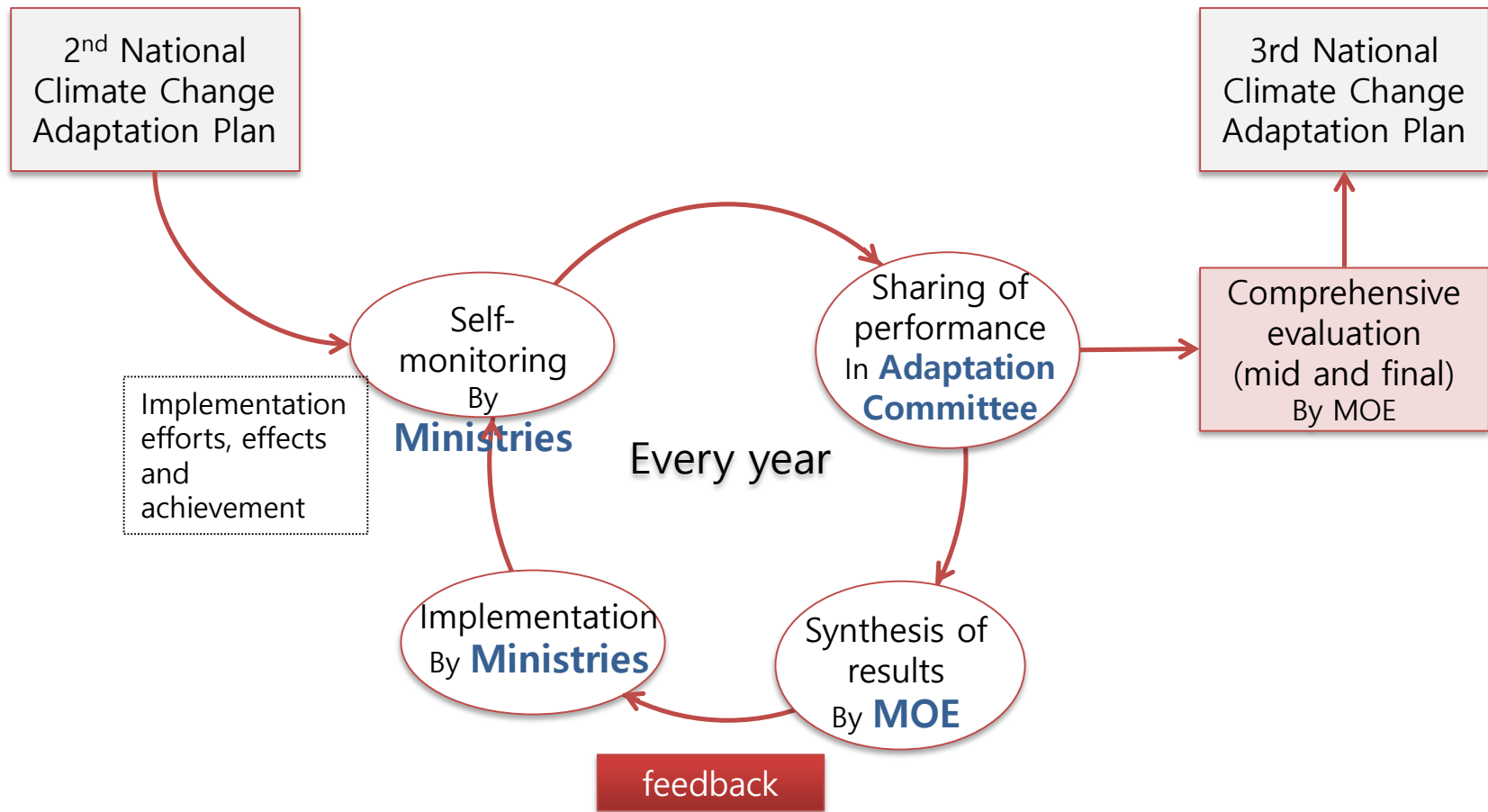
Division	Contents
Vision	<b>Cooperative adaptation</b>
Specific goal	<ul style="list-style-type: none"><li>• (2020) Adaptation that people can participate in</li><li>• (2035) Internationally cooperative climate change adaptation</li></ul>
Planning indicator	<ul style="list-style-type: none"><li>• National adaptation awareness</li><li>• Climate change education beneficiary countries</li></ul>
Focused initiatives	<ul style="list-style-type: none"><li>5-1. Strengthening the effectiveness of adaptation policies</li><li>5-2. Promoting regional adaptation activities</li><li>5-3. Strengthening international cooperation on adaptation</li><li>5-4. Strengthening PR &amp; education on adaptation</li></ul>

## III-2. 2<sup>nd</sup> National Climate Change Adaptation Plan

### 5. Effect through the 2<sup>nd</sup> Adaptation Plan



# III-3. Monitoring structure for implementing 2nd National Climate Change Adaptation Plan



I

II

III

IV

Conclusion and Suggestion

## IV. Conclusions and Suggestions

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- Improved the national adaptation capacity through two times of national adaptation planning experiences
- Set up a comprehensive implementation system by establishing sectoral, regional, municipal-level implementation plans
- Structure and implementation of 'Monitoring and evaluation' in Korea are also making and ongoing process
- In order to make the NAP a success, it is equally important to share monitoring and evaluation results with other countries to learn from one another

Thank you

