Water Disaster Mitigation Policy and Strategy under Climate Change: Case of Korea

April 2015

Prepared by MOLIT
1. Introduction to Climate Change in Korea

2. Water-related Disasters and Management in Korea

3. Future of Water-related Disasters and Climate Change: Forecasts and Policy Directions

4. Policy to Mitigate Water-related Disasters and Adapt to Climate Change

5. Conclusion
Climate Change is a global issue that stands behind water-related disasters such as flood and drought, and affects agriculture, groundwater, water quality, and ecology, thereby negatively influencing the environment and the daily lives.

Cost of climate change is expected to reach over 800 trillion dollars by the end of the 21 century. However, this cost can be saved by taking preventative actions and minimizing trial and error process. A national climate change response strategy is essential to both efficiently and effectively address the challenges of climate change.
In April 2010, the Korean government enforced ‘Framework Act on Low Carbon, Green Growth’ and established ‘National Climate Change Adaptation Master Plan’ (2011-2015). 87 projects under 10 themes are underway to implement the Plan. 13 line ministries and local governments have set up specific plans to support the Plan and act in response to climate change (Related ministries, 2010).
Flood and typhoons are the two key water-related disasters in Korea. Both account for 33% of the number of water-related disasters, respectively, thereby taking up 66% of the entire figure. In terms of damage costs, floods rank the first (59%) followed by typhoons (28%).
2. Water-related Disasters and Management in Korea

Key Water-related Disasters in Korea

➢ Status on Water-related Disasters

End of 1990s: Flood of the Imjin river basin

- The river also has a steep gradient with numerous streams, and the downstream is heavily influenced by tides.
- Unusual weather patterns led to sequential torrential rainfalls.
- The Korean government introduced a multi-purpose dam in Imjin river basin to prevent water disasters at the source.
- The Korean government issued a provision on ‘Disaster Relief and Disaster Restoration Standards’ that include the areas that require permanent restoration efforts.

2000s: Flood due to Typhoon

- The Korean government amended the Natural Disaster Countermeasures Act to include ‘Special Disaster Area’ and declared all severely harmed counties as Special Disaster Area so that the victims of natural disaster can focus on recovery.
- revised the River Act to designate river sections and introduce emergency action plans for dams and reservoir as a mandatory.

Early 2010s: Urban Flood

- Consecutive localized heavy rains have raised awareness on the issues entailed urban flood.
- Various regulations on urban planning were amended to introduce disaster vulnerability analysis system.
- Design criteria for sewer systems and pump stations have been extended from 10 to 30 years; that for streams have also been extended from 50 to 80 years.
Flood Vulnerability

Policy Directions based on Flood Forecasts

- The National Water Resource Plan (2006-2020) by the Ministry of Land, Infrastructure and Transport includes a section on flood mitigation. The government envisages establishing a solid, safe foundation for better flood control and will aim to enhance society’s ability to respond to flood.

<table>
<thead>
<tr>
<th>Vision</th>
<th>Establish solid, safe foundation for flood control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goal</td>
<td>Enhance society’s ability to respond to flood</td>
</tr>
<tr>
<td>Strategies</td>
<td>Improved flood control by utilizing facilities</td>
</tr>
<tr>
<td></td>
<td>Counter Abnormal Floods</td>
</tr>
</tbody>
</table>

<Flood Management: Vision, Goals and Strategies (Ministry of Land, Infrastructure and Transport)>
In National Water Resources Plan (2006), in order to respond efficiently to future water shortage and to secure abundant water environment, the government set the target to provide clean and sufficient water to people and nature consequently setting its vision to achieving water rich country in the 21st century.

**Policy Directions for Future Water Shortage**

- Create 21st century environment where clean water is stably and equally supplied to the citizens of South Korea
- Foster economic efficiency in water supply & demand management and water resources development

**Goal**

Supply clean, sufficient water for the general public and nature

**Strategies**

- Reinforce sound water use system through demand & supply management
- Conserve river ecosystem and water quality by securing river maintenance water
- Secure water supply for regions experiencing constant droughts
- Create water resources that reflect regional characteristics and economic efficiency
- Adaptability to respond to unexpected droughts

Urban Flooding

Directions for Future Urban Flooding

- Limitation of existing urban flood protection

  - Investment of flood prevention / Lack of investment in urban area
  - Establishing and implementing of investment plan by each department
  - Not enough to relieve flooding in the city with structural problems
  - Existing individual investment takes excessive costs

Lack of linkage between plans

limitation of respond in target area (limitation of flood control ability/ excessive costs)

Need for new concept of flood control measures which are optimally linked to each department's flood control facilities
3. Future of Water-related Disasters and Climate Change: Forecasts and Policy Directions

Urban Flooding

Directions for Future Urban Flooding

- Limitation of existing urban flood protection

- Connect the business of each department to watershed council

- Significant rise from 15 to 100-year flood protection capability

- Reduce about 45% of costs when comparing the 100-year frequency

- Reduce from 448.2 billion won to 249.3 billion won in budget

- Need enlargement to nationwide as confirmed by the excellent results
Use of National Rainfall Radars for Flood Forecasting

- The Ministry of Land, Infrastructure and Transport uses rainfall radars with dual-polarization sensors to improve the accuracy of rainfall monitoring and efficiency of flood as well as other water-related work. The initial plan is to install 6 large S-band radars and 5 small X-band radars in 11 river basin observatories by 2016.
Master Plan for Responding to Climate Change and Improving Disaster Management

- Master Plan for Responding to Climate Change and Improving Disaster Management envisions a ‘disaster-free advanced nation’. The five strategies align to realize this vision:

- **Vision**
- **Aim**
- **Strategy**

**<Figure 2> Seoul’s Flood Mitigation Plan**

- **<Short term>** Enhance citizens’ sense of safety through prioritized investments in vulnerable areas
- **<Mid & Long term>** Establish advanced disaster prevention system against climate change and strengthen fundamentals of disaster management

---

- **Past & present**
  - Lacked ability to forecast extreme weather
  - Megaopolis more vulnerable due to rapid urbanization
  - Inadequately maintained disaster prevention facilities due to lack of investment in preparedness
  - Lacked coordination in responding to multiple disasters
  - Research and infrastructure insufficient to prepare for future disasters

- **Way forward**
  - Upgrade disaster standard to mitigate climate change and enhance forecasting capabilities
  - Make disaster-safe cities
  - Customize investment to strengthen land resilience against disasters
  - Establish integrated disaster response system
  - Strengthen foundation for recovery and necessary infrastructure
Effects of climate change have become a part of everyday life, affecting us in various forms.

The Korean Ministry of Land, Infrastructure and Transportation aims to establish water management system that can fully adapt to climate change and has put strong efforts to build country’s disaster risk management capacity against extreme flood and drought.

And the Ministry of Land, Infrastructure and Transportation is leading the efforts to make Korea more resilient to climate change and is preparing water resource management strategies that can not only minimize the damages from natural disasters but also support sustainable growth.
Thank you

“Although the impacts of climate change are uncertain, they can be managed like any other risk “