

Korea's Vulnerability to Climate Change and its Adaptation Policies

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1. Climate Change Adaptation Measures and Research Activities of Korea

- Governmental Countermeasure Committee for the Agreement on Climate Change is launched (chairman: Prime Minister), in addition, a comprehensive plan was established and enforced three times in response to Climate Change
 - Till present, much emphasis was placed on the mitigation of Greenhouse Gas Emissions
 - The evaluation on the impact of climate change and its adaptation measures are at their initial stages

- "Promotion for the basis of Adaptation on Climate Change" was included for the first time on the 3rd Governmental comprehensive plan on Countermeasure to Climate Change ('05-'07)

- Research Activities on Adaptation in Various Sectors
 - Evaluation on the health damages and impacts of climate change ('03- '05, Ministry of Environment)
 - Evaluation Standards on the Impact of Climate Change on Water Resources (in progress, Ministry of Science and Technology)
 - General analysis on the impacts of climate change in each field, establishing an efficient national adaptation policy framework based on the full understanding of the vulnerabilities ('05- '07, Korea Environmental Policy and Evaluation Institute)

2. Vulnerability to Climate Change and its Impact in Korea

a. Summary

- In the span of the last century average temperature has risen by 1.5°C (global average has risen by 0.6°C)
 - Temperature has risen from 12°C in the 20th century to 13.5°C in the 21st century even when excluding the effects of urbanization, there was an increase of 0.4 -0.8°C (larger impact of urbanization rather than global warming)

- During the past 20 years, annual rainfall and days with heavy rainfall has increased in the Southern region of Korea
 - Increase of annual rainfall by 7% and days with heavy rainfall by 23%
 - Decrease of annual number of rainy days by 14%
 - Occurrence of extreme natural disasters such as the heaviest snowfall in 32years, the worst draught in history, and the heaviest rainfall in 37years, are rising in frequency and intensity

- It is estimated that the average climate will rise 1.2° by the 2020's, 2.4°C by the 2050's, and 4.0°C by the 2080's.
 - * **Long-term A2 Scenario based on the climate change model by the Meteorological Research Institute**

b. Vulnerabilities and Impacts on each Sector

(1) Agriculture

- Regions ideal for cultivation will proceed northward and expand due to global warming
 - Cultivation areas for warm season fruits including tangerine, citron, and kiwi fruit will expand
 - Cultivation areas for temperate fruit trees such as apples, pears, peaches, grapes, etc are expected to face difficulties if global warming continues
 - * **Parts of the region cultivating apples may have to abandon future cultivation**
 - Possibility of cultivating subtropical fruit trees in Jeju Island is expected, but regions growing cool-season vegetables will have to move north
- Due to a rise in average temperature, frost damage has decreased yet the damage from noxious insects has increased
- A rise in frequency and intensity of damage due to agricultural atmosphere disaster
 - The frequency of typhoon, hurricane, heavy snow, drought, hail, yellow sand storms, etc has increased from 48 cases in 1910 to 190 cases in 1990

(2) Forestry

- Change of air composition, such as the increase in density of CO₂, and the extension of rearing period is anticipated to increase the productivity of mountains and forests
- On the contrary, limiting factors such as forest fires, landslides, outbreaks of insects, pests and plant pathogens may occur
 - the number of subtropical insects and pathogens, as well as forestry viruses such as the pitch canker are expected to increase due to the rise in winter temperatures, allowing their transfer.
- Trees more acclimatized to colder environments such as pine trees may decline in number due to rise in winter temperature

(3) Fisheries

- There lies a possibility that the rise in water temperature will change the surrounding temperate waters of Korean Peninsula to subtropical waters
 - During the past 30-40years, the catch of warm water fishery species such as mackerel, anchovy, cuttlefish, etc has increased.
 - The winter fisheries for cuttlefish has moved 60miles north and expanded during the past 20years

- The catch of cold water fisheries species such as walleye pollack, codfish, etc had decreased sharply

- The rise in water temperature due to climate change may induce long-term and large-scale red- tide, causing serious harm to the reproduction of fish and shellfish

- The rise in sea level will cause a serious loss of vast tidal flats
 - Since many fisheries resources such as micro algae, zooplankton etc inhabit in tidal flats, encompassing the vital ecosystem, the loss of the area will bring about serious future damage

- ※ **When the sea level rises by 1 meter, 1.2% of the total territory (2,643km²) and 2.6% of the total population (approximately 1,250,000 people) will be vulnerably exposed to the flood**

(4) Water Resources

- Increase in the threat of floods
 - Concentration of rainfall in the summer will increase the damage due to floods
- Increase in the fluctuation of outflow will not add to the relief of water shortage
 - Droughts in Korea are highly due to massive fluctuations in outflow each season

(5) Health

- Additional casualties due to intense heat will increase
 - In Korea, additional casualties due to intense heat were recorded in 1994
- In the northern regions of Gyeonggi province, there was a consistent reoccurrence of malaria since 1993

3. Adaptation Measures on Climate Change

※ From the 3rd Governmental Comprehensive plan on Countermeasure to Climate Change

(1) Agriculture

- Foster species suitable to the changing climate
- Change the farming methods and the kind of crops being cultivated

(2) Forestry

- Forest hazard programs should be implemented to avert forest fires and landslides
- Policies for the maintenance in the productivity of forests should be prepared
 - Planting of tree species adequate for colder climates should be avoided while substituting other adequate species
- Alien pest insects and newly introduced plant pathogens (especially those from the subtropical regions) should be closely monitored through strict inspection
- Implementation of the ecosystem preservation framework
 - The preservation measures in regard to the species vulnerable to climate change should be strengthened

(3) Fisheries

- The impact and response to the rise in sea level of the peninsular
 - Establishment of defense measures on coastal erosion and structures
- Response to the diversification of fishery resources
 - continual monitoring of fishery resources through the prediction of the shift in fishery resources and change in fishing waters due to climate change

(4) Water Resources

- Integrated countermeasures for floods among ministries and government agencies
- Increased the efficiency of water resources management
- A systematic and accurate structure that will predict early warnings of floods to the central government and local authorities in order to minimize the damage from disasters

(5) Health

- The formation of a Fundamental management program and database for infectious diseases
 - Accumulate data from forecasts on the prevalence of malaria, Japanese encephalitis, cholera, vibrio, etc

4. Future Directions of the Korea's Adaptation Policy

- Diverse adaptation programs should be formed in deference to each region and field
 - Diverse adaptation methods need to be created and enforced in respect to the various adverse impacts of climate change in each region and field

- The implementation of adaptation measures should be made taking national socioeconomic development into account
 - Adaptation measures on climate change had previously been promoted fragmentarily, separately, and partially, while not being jointly considered in relation to national development methods. /END/