Climate Change Country Profile: Republic of Korea

1. Country description

1.1 Geography

- Location: 125°04′–131°52′, 36°06′–38°27′
- Temperate zone
- Land area: 99 646 km² (2005), forest: 65%

Figure 1. Map of the Republic of Korea

1.2 Demographics

- Population: 48 138 000 in 2005
- Population density: 474 persons per km² (third densest country in the world)
1.3 Economic and industrial development characteristics

- Gross domestic product (GDP): US$ 787.5 billion
- GDP per capita: US$ 16,306

1.4 Climate (climatic zones, trends in temperature and precipitation)

Figure 2 depicts the trend of greenhouse gas emissions over 15 years. By 2005, the Republic of Korea was producing 591.1 metric tonnes of greenhouse gas emissions annually, or 12.24 metric tonnes per person.

Figure 2. The trend of greenhouse gas emissions (1990–2005)

![Graph showing greenhouse gas emissions trend](image)

Source: Korea Energy Economics Institute, 2007

Figure 3 projects future greenhouse gas emissions and identifies the sources. The calculations were based on the assumption that the current shift of the Republic of Korea’s industrial structure would continue and that considerable effort to reduce emissions would not be implemented.

Figure 3. The trend of projected greenhouse gas emissions

![Graph showing projected greenhouse gas emissions](image)
Source: Korea Energy Economics Institute, 2007
Table 1 compares climate changes in the Republic of Korea with the global mean. By the end of the 21st century, the Republic of Korea would have experienced an average temperature increase of 5°C, a sea level rise of 50 cm, and an annual precipitation increase of 15%.

**Table 1. Climate changes in the Republic of Korea**

<table>
<thead>
<tr>
<th>Contents</th>
<th>Republic of Korea</th>
<th>Global mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air temperature rise (from 1905 to 2005)</td>
<td>1.5°C</td>
<td>0.74±0.18°C</td>
</tr>
<tr>
<td>Annual precipitation (mm)</td>
<td>1166 (1920) → 1501 (2006)</td>
<td></td>
</tr>
<tr>
<td>Sea level rise (mm/yr)</td>
<td>1-6</td>
<td>1.3–2.3</td>
</tr>
</tbody>
</table>

The following figures and table depict trends in temperature (Figure 4), disasters (Figure 5), yellow dust (Figure 6) and Japanese encephalitis (Table 2).

**Figure 4. Number of extremely hot days in Seoul (1991–2000)**

Source: Jang et al., 2003
Figure 5. Disaster frequency and duration (1991–2000)

Source: Jang et al., 2003

Figure 6. Yellow dust in Korea (1991–2006)

Source: Ministry of Environment, 2007
Table 2. Japanese B encephalitis watches and warnings

<table>
<thead>
<tr>
<th></th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date of watches</td>
<td>9 May</td>
<td>23 May</td>
<td>8 May</td>
<td>26 Apr</td>
<td>14 Apr</td>
<td>20 Apr</td>
</tr>
<tr>
<td>Date of warnings</td>
<td>26 Sep</td>
<td>27 Aug</td>
<td>6 Aug</td>
<td>4 Aug</td>
<td>21 Jul</td>
<td>26 Jul</td>
</tr>
<tr>
<td>Number of</td>
<td>6</td>
<td>1</td>
<td>0</td>
<td>6</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>reported cases</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* As of November  
Source: Korea Centres for Disease Control and Prevention (KCDC)

2. Burden of climate-sensitive health outcomes

2.1 Data on current climate-sensitive disease burdens

Climate-sensitive diseases include heat-related diseases, vectorborne diseases, waterborne diseases, diseases from urban air pollution, and diseases related to extreme weather conditions such as floods, droughts, windstorms and fires.

The following figures and table show trends in tsutsugamushi disease (Figure 7), Malaria (Figure 8), hemorrhagic fever with renal syndrome (Figure 9), Leptospirosis (Figure 10), heat waves and deaths (Figure 11) and PM10 concentration and asthma (Figure 12).

Figure 7. Tsutsugamushi disease

Source: Reported cases, KCDC
Figure 8. Malaria

Source: Reported cases, KCDC

Figure 9. Hemorrhagic fever with renal syndrome (HFRS)

Source: Reported cases, KCDC
Figure 10. Leptospirosis

Source: Reported cases, KCDC

Table 3. Infectious diseases

<table>
<thead>
<tr>
<th>Diseases</th>
<th>Time lag (month)</th>
<th>Increase in incidence rate when 0.5°C rise (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tsutsugamushi disease</td>
<td>2, 3, 4</td>
<td>8 (7-8)</td>
</tr>
<tr>
<td>Malaria</td>
<td>1, 2, 3</td>
<td>2 (1-2)</td>
</tr>
<tr>
<td>Leptospirosis</td>
<td>3, 4</td>
<td>10 (6-13)</td>
</tr>
<tr>
<td>HFRS</td>
<td>4, 6</td>
<td>10 (7-14)</td>
</tr>
<tr>
<td>Shigellosis</td>
<td>0, 1</td>
<td>3 (3-4)</td>
</tr>
</tbody>
</table>

Source: Park et al., 2006
Figure 11. Heat-waves and deaths (1991–2000)

Source: Jang et al., 2003

Figure 12. PM10 concentration and asthma
2.2 Potential impacts of climate change on health burden, i.e. qualitative and quantitative projections of future health burdens

Information is not available.

2.3 Information on particularly vulnerable populations

Information is not available.

3. National programmes and projects

3.1 Programmes to reduce and/or mitigate greenhouse gas emissions.

Demand
- Expansion of Energy Service Company (~2006): 2852 cases, US$ 0.9 billion
- High efficient equipment certification programme (1996~)

Supply
- Stable supply of natural gas: 80% to 2015
- Promotion of landfill gas: 50 MW power plant completed 2006

Energy efficiency
- Energy efficiency standards and labelling programme: grade 1&2 occupied (69.5%)

3.2 Climate change related studies and projects, including their roles in the Second National Communications.

Infectious disease control programme
- National malaria elimination programme
  - Integrated management in the region at risk
  - Preventive use of antimalaria drug (given to soldiers)
  - Vector surveillance and forecast
- Tsutsugamushi disease control
- Japanese B encephalitis vector surveillance and forecast
- Dengue fever and West Nile Fever surveillance
- Waterborne and foodborne disease surveillance and control

Non-infectious disease control programme
- Yellow dust - health surveillance system
- National survey on cerebro-cardiovascular disease and allergic disease: cardiac arrest, acute myocardial infraction, stroke, asthma, atopy, etc.
- National cerebro-cardiovascular disease control action plan
- Development of asthma index
3.3 Further data and research needs on potential health impacts of climate change

Information is not available.

3.4 Current and expected programmes and activities for adaptation to current and projected climate-related health burdens

Information is not available.

4. Institutional organization

Key organizations and/or institutions dealing with climate change are depicted in Figure 13.

Figure 13. Inter-Ministerial Committee on UNFCCC

5. Issues and challenges

Critical issues and challenges that the country faces in relation to mitigation and adaptation to climate change to reduce health impacts are:

- too much concentration on greenhouse gas reduction (90% of total budget);
- shortage of experts;
- focus on the health impacts of climate change limited to infectious diseases; and
- lack of a comprehensive vector surveillance system.
Figure 14. Overall strategy to address the issue of climate change and health in the Republic of Korea