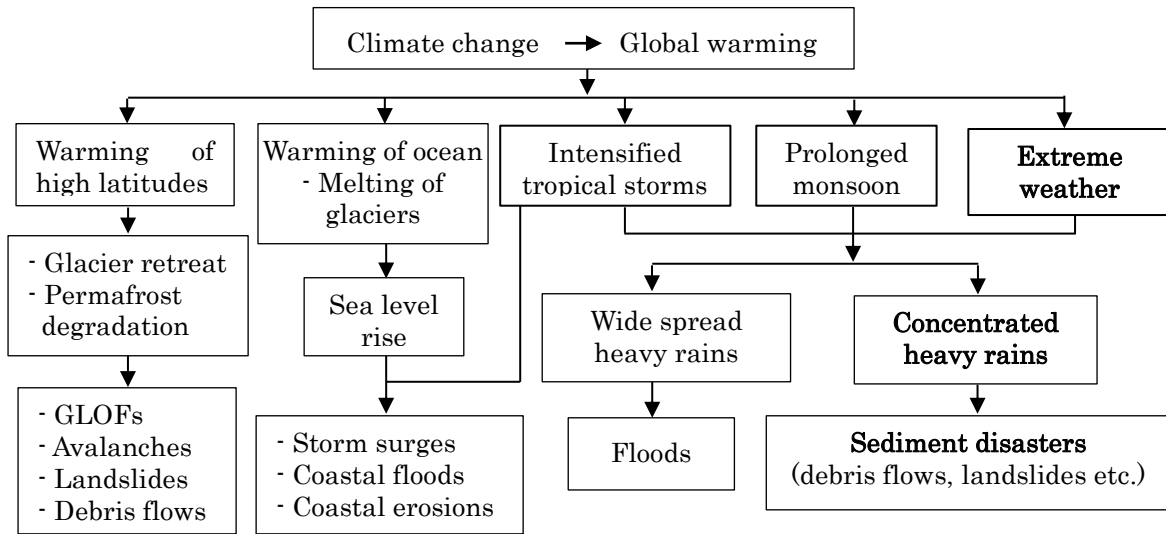


**Figure.1 Impacts of climate change**



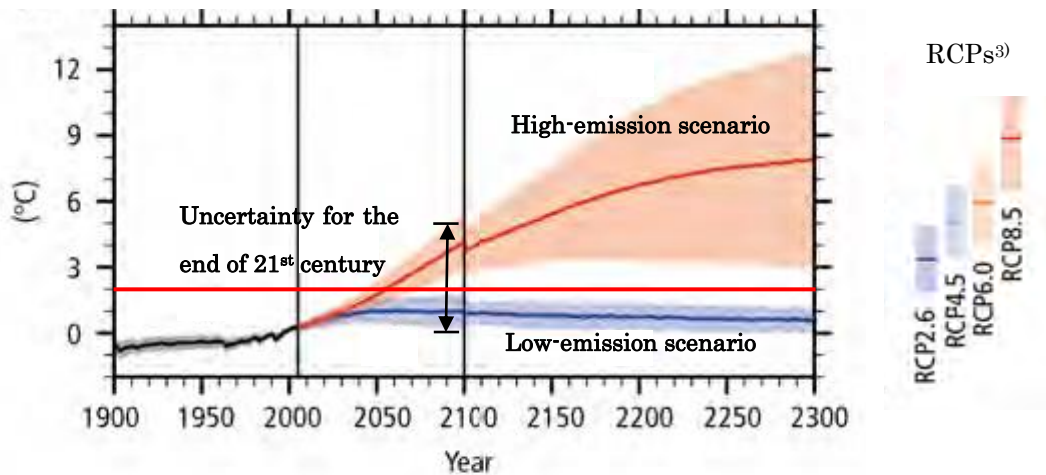
*Source: Prepared in reference to IPCC Special Report “Managing the risks of extreme events and disasters to advance climate change adaptation”*

**Table.1 Climate change and impacts, observed and projection at the end of 21<sup>st</sup> century**

General	<ul style="list-style-type: none"> <li>Climate change is already occurring with wide-spread impacts in all continents across the oceans.</li> <li>Climate change will persist for many centuries even if emissions of CO<sub>2</sub> are stopped due to cumulative emissions in the atmosphere.</li> </ul>
Temperature (See Figure.2)	<ul style="list-style-type: none"> <li>Global temperature rose by 0.85°C since pre-industrial era (1850-1900), and will rise by another 0.3-4.8°C by 2100.</li> <li>If the temperature increases by 2°C above pre-industrial levels, then catastrophic collapse of ecosystems become possible with unforeseen, non-linear impacts.</li> </ul>
Precipitation	<ul style="list-style-type: none"> <li>Heavy precipitation events will increase over most areas of the globe.</li> <li>A 1-in-20 year annual maximum 24-hour precipitation rate will become a 1-in-5 to 15 year event by the end of 21<sup>st</sup> century in many regions.</li> <li>More precipitation will occur in wet regions and in wet seasons, and less in dry regions and dry seasons.</li> </ul>
Tropical cyclones	<ul style="list-style-type: none"> <li>Wind speed and precipitation will intensify.</li> <li>However, global frequency of tropical cyclones will either decrease or remain essentially unchanged.</li> </ul>
Monsoon	<ul style="list-style-type: none"> <li>Precipitation will intensify.</li> <li>Onset dates will be earlier and retreat dates will be delayed resulting in lengthening of the monsoon season.</li> </ul>
Sea level	<ul style="list-style-type: none"> <li>Global mean sea level rose by 0.19 m during 1901-2010 and will rise by another 0.26-0.82 m by 2100.</li> </ul>
Glacier retreat, Permafrost degradation	<ul style="list-style-type: none"> <li>More frequent and larger rock and ice avalanches, GLOFs, landslides, debris flows etc.</li> </ul>

*Source: Prepared in reference to IPCC AR5 WG1, B and E*

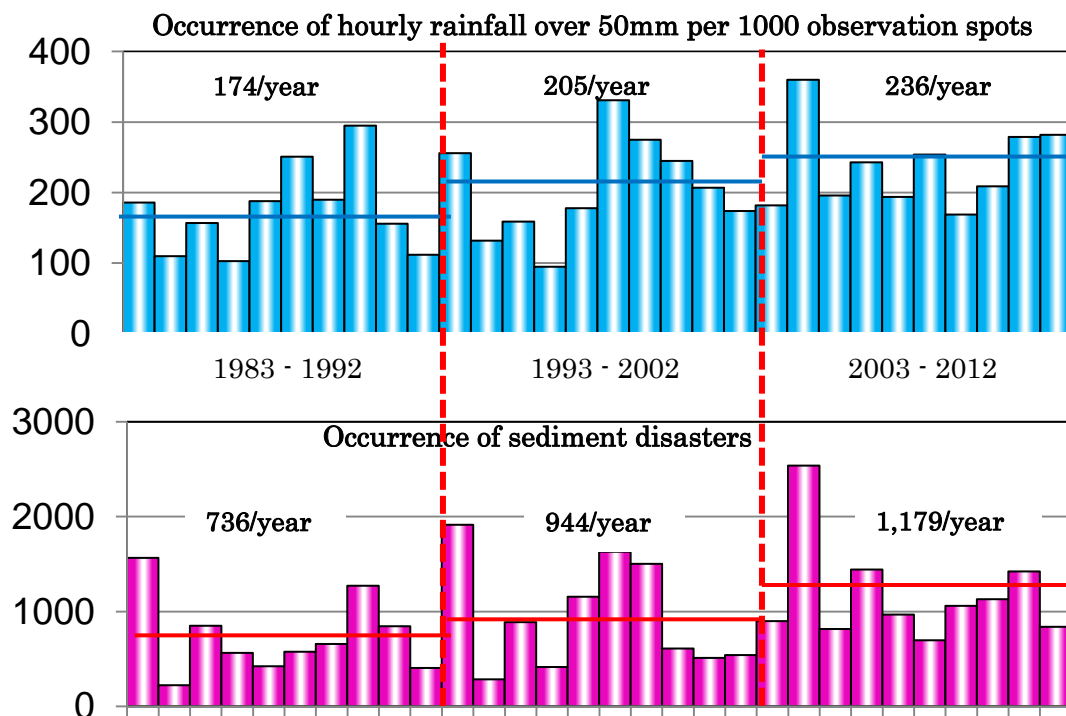
**Figure.2 Global temperature change, observed and projected 1900-2300 (relative to 1986-2005)**



The temperature will rise continuously with increasing uncertainty. Warming will continue beyond 2100 under all RCP scenarios except RCP2.6. RCP2.6 is a low-emission scenario to limit warming to less than 2°C relative to pre-industrial level, which was agreed at COP16 in 2010 at Cancun, Mexico. To realize this target, 40% to 70% reduction in GHGs emission by 2500, relative to 2010 level, and emission level near zero or below in 2100 are necessary (IPCC AR5 Synthesis Report 3.4). COP 21 (Paris in December 2015) aims at agreement on “zero emission”, though the hurdle is high.

*Source: IPCC AR5 Synthesis Report, Figure 2.1*

**Figure.3 Extreme rains and sediment disasters over the past 30 years in Japan**



This is an evidence that climate change has been occurring with visible impacts since decades ago in Japan. Occurrence of heavy precipitation and sediment disasters are already being monitored in several countries. The Symposium may propose to initiate to establish a world-wide data base using common format.

*Source : Ministry of Land, Infrastructure, Transport and Tourism, Japan*

**Foot notes**

3) RCPs (Representative Concentration Pathways) are scenarios corresponding to GHG emission level:

A stringent mitigation scenario (RCP2.6), two intermediate scenarios (RCP4.5 and RCP6.0), and one scenario with high GHG emission (RCP8.5). (See IPCC AR5 Synthesis Report, Box 2.2 for details)