

HRI Report

Government and Company Initiatives for Climate Change Adaptation

Naofumi Sakamoto, Senior Strategy Staff

Keiko Jono, Chief Researcher, Global Policy & Management Research Center

The Paris Agreement that was adopted at the COP21 (21st Conference of the Parties to the United Nations Convention on Climate Change) in December 2015 has garnered attention as an international framework on climate change in which all countries would participate. Over the years, goals for the reduction of greenhouse gas emission (climate change mitigation) have been discussed at COP. While negotiations were difficult, “adaptation” plans to reduce the impact of climate change were also under consideration at the same time. This report provides an overview of the progressive adaptation efforts advanced by governments and companies of different countries in conjunction with the COP negotiations.

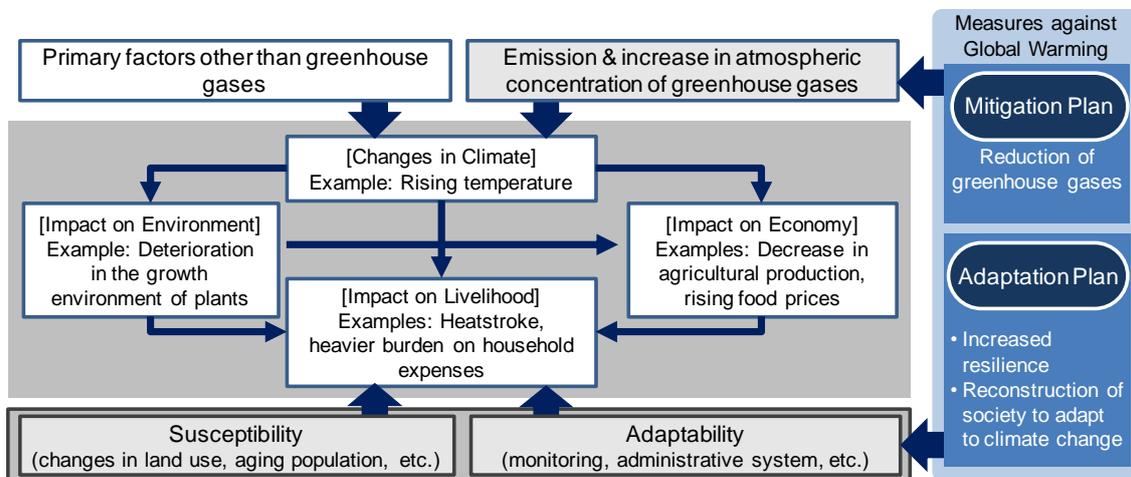
1. Adaptation Plans for Climate Change Issues

1.1 What is an adaptation plan?

As climate change issues have become more apparent, there has been heightened attention toward climate change “adaptation” as well as “mitigation” plans. “Adaptation” is defined as the process of adjustment with regard to climate

changes that are already apparent or are expected to become apparent as well as their impact (IPCC Working Group 2 Contribution to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change Box SPM.2). Specifically, when climate changes such as rising temperature and precipitation as a result of increased greenhouse gases have brought about an impact on the natural environment, economic society and livelihood, implementing adaptation efforts helps to lighten that impact by reducing the susceptibility and enhancing the adaptive capability to evade or reduce the influences of climate change (Figure 1).

For example, an increase in temperature not only brings about a direct impact on the daily lives of people, such as more cases of heatstroke, it also has an environmental impact on nature such as deterioration in the growth environment of plants, affects society and the economy, such as with declines in agricultural production and rises in food prices, and has an impact on other livelihood aspects, including a heavier burden on household expenses. Some adaptation plans that can be considered to address these issues include greening to curb the heat island effect and



Prepared by Hitachi Research Institute based on data from Nobuo Mimura, Shunji Ota et al., *Climate Change Adaptation Plan Design*, March 31, 2015

Figure 1: Effects of Climate Change & Corresponding Mitigation and Adaptation Plans

securing agricultural products through the development and widespread use of plants that can withstand a higher temperature.

The effects of climate change are surfacing in various parts of the world, such as the frequent occurrence of major floods in Europe and droughts in China and India. There is an increased need to introduce adaptation plans to reduce the impacts of climate change as the existing infrastructure is unable to withstand them and serious damage has been caused as a result. In the synthesis report of the IPCC Fourth Assessment Report adopted in November 2007, it has been clearly stated that neither the adaptation plan or the mitigation plan are able to singlehandedly prevent all the impacts of climate change, but the accompanying risks can be largely reduced by enforcing both the adaptation and mitigation plans in a mutually complementary way.

1.2 Adaptation measures adopted by individual countries

Along with the growing awareness toward the importance of adaptation plans to address climate change, the number of countries that are implementing such plans are rapidly increasing. As seen in Figure 1, actions to devise adaptation strategies and plans are expanding among the OECD member nations. Meanwhile, a group of emerging nations including China, Thailand and Tuvalu have already formulated adaptation plans at the national level.

At the UN level, an agreement has also been reached “to assign the same priority level to adaptation plans as mitigation plans” under the United Nations Framework Convention on Climate Change (UNFCCC) (COP16, 2010). At the COP21 meeting in 2015 to consider the framework for the new global warming countermeasures from 2020,

measures for accelerating the adoption of adaptation plans were discussed. Decisions have also been reached to set global adaptation goals, and for each country to take actions to draft and implement their plans, submit and update adaptation reports, as well as engage in international cooperation.

In response to this agreement, the Japanese government also made a cabinet decision in November 2015 on the “National Plan for Adaptation to the Impacts of Climate Change.” Moving forward, ministries will work together to promote efforts in a wide range of areas, including “agriculture, forestry and fisheries,” “natural disasters and coastal areas” and the “national and urban livelihood.”

While the establishment of global adaptation goals has been set forth in the aforementioned Paris Agreement, quantitative targets were not set. In other words, a pyramid structure for promoting the implementation of the adaptation goals agreed upon at the UN level in the respective countries does not exist. For this reason, we will not discuss the formation of the framework under UNFCCC in this article, but focus on outlining the advanced efforts made by countries to draw up national adaptation programs, as well as contributions to the adaptation plans in the private sector through the projects undertaken by some companies.

2. Formulation of Adaptation Programs in Developed Nations: Case Study of the UK

While how the adaptation plans are to be fleshed out in Japan remains an issue, the British government has

Table 1: National Adaptation Strategy & Progress of Adaptation Plan among OECD Countries

Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	
National Adaptation Strategy	Finland	Chile France Spain	Australia Mexico Netherlands	UK Denmark Germany Hungary		Belgium Korea Portugal		Austria Ireland Switzerland Turkey	Czech Estonia Greece Israel Italy	Norway Poland Slovenia Slovakia
National Adaptation Plan		Spain		Finland	Mexico		France Germany Luxembourg Netherlands	Austria Denmark Turkey	UK Belgium Chile Estonia Hungary	Israel Poland Portugal Slovenia Switzerland

Prepared by Hitachi Research Institute based on data from OECD, Water and Climate Change Adaptation (2013)

garnered attention to introduce an adaptation plan in cooperation with the private sector as part of its policy to establish a competitive edge among British companies.

In relation to the mitigation and adaptation measures to address climate change, the UK has enacted the “Climate Change Act 2008,” which stipulates the risk assessment for climate change and formulation of a UK adaptation program. Based on the act, the British government released the “UK Climate Projections 2009 (UKCP09)” in 2009, which predicted changes in the climate of the UK until the end of the 21st century. This was followed by the announcement of the UK Climate Change Risk Assessment in 2012 and the National Adaptation Program in July 2013.

One of the vital roles in conjunction with the UK government’s efforts in the adaptation program is the implementation of the Adaptation Reporting Power. The Adaptation Reporting Power was established in the Climate Change Act 2008 to make it obligatory for organizations and businesses providing services and infrastructure that are essential to the citizens’ lives to report climate change risks and the corresponding measures to the government. This report aims to (1) promote climate change risk management in the organization; (2) increase the resilience of public services and infrastructure against climate change; and (3) supervise the progress and status of the measures in important sectors.

Based on the Adaptation Reporting Power, over 100 companies from sectors such as energy, transport and water have submitted their reports between December 2010 and December 2011 (first round).

Included in the report were (1) functions of the organization; (2) assessment of current and future risks as a result of climate change; and (3) measures to tackle the risks. According to an analysis conducted by Cranfield University, preparation and submission of the reports has allowed the government to grasp the risks of climate change and the corresponding measures that are expected in infrastructure and public services. In addition, doing so has (1) helped organizations managing infrastructure and public services to visualize the climate change risks and integrate them into the risk management process; and (2) enhanced awareness toward the obstacles when

implementing the countermeasures as well as the mutual dependency among the infrastructures, which created opportunities for cross-sector efforts.

Moving forward, a second round of report submission has been requested in 2016. In addition to the organizations that participated in the first round, the scope has been widened to include organizations from industries such as ocean management, fisheries, medical and nursing care as well as firefighting.

The UK Climate Change Risk Assessment, which assesses the risks at the country level, is conducted every five years with the next assessment report expected to be released by January 2017. Also, the national adaptation program is scheduled for review once every five years, and the new adaptation program is expected to be announced by 2018. The second round report will be based on the current Adaptation Reporting Power reports that are being submitted to and released by the government, and it will be used as an input for the risk assessment process in 2017 and formulation of the adaptation program in 2018.

To sum up, UK government does not only conduct risk assessments and formulate adaptation programs as a government entity. By having organizations providing public services and infrastructure that are essential to the citizens’ livelihood to provide the necessary information, the government has built a system to grasp the actions taken by these organizations, while at the same time promote risk awareness and measures to address the risks among them.

3. Trend of Adaptation Measures among Leading Companies

A unique approach by the UN is an initiative known as “Private Sector Initiative (PSI): database of actions on adaptation.” PSI is a database set up by the UNFCCC secretariat in 2011. It is a system for private companies to voluntarily submit and register their efforts (case studies) related to innovative adaptation measures. While the degree of commitment varies due to it being a voluntary effort by the private sector, this system is nonetheless able to offer information on approaches to implementing progressive

initiatives as well as the know-how of companies. As of the end of September 2016, 102 case studies were recorded, among which only two cases belonged to Japanese companies. Besides the aforementioned UK companies that are working in tandem with the national adaptation program of their country, endeavors by US companies have also attracted much attention. Based on the case studies in the PSI, I have summarized below three points that may be of help to Japanese companies.

3.1 Detailed quantitative assessment of impacts posed by climate change

The starting point of risk management for private companies is the assessment of the impact on the supply chain following floods and droughts brought about by climate change. For example, in the food industry, difficulty in the procurement of raw materials from overseas is a critical issue. While progressive companies in many industries put effort into assessing the risks of their own supply chain, quantitative assessment still remains inadequate. Against this backdrop, companies such as Maplecroft (UK) have begun to offer services and tools to support the risk evaluation process of individual companies using a uniquely defined assessment index (Table 2). Other companies such as Cisco Systems (US) transcend the boundaries as a company to develop systems to support the decision-making process of policymakers at the central and local governments.

Table 2: Detailed Quantitative Assessment of Impacts Posed by Climate Change

Company	Initiatives	Target Region
Maplecroft (UK)	<ul style="list-style-type: none"> Assesses company risk using the in-house Risk Atlas with a 25km² resolution (based on the Climate Change Vulnerability Index that is developed in-house) 	193 countries including UK
Acclimatise (UK)	<ul style="list-style-type: none"> Quantitatively assesses climate change risks for companies' overseas investment projects, and 	Central and South America

	develops web-based tools for proposing measures to counter the risks.	
Cisco Systems (US)	<ul style="list-style-type: none"> In the process of joint research with NASA to develop a decision-making system (for policymakers) for adaptation plans that make use of Big Data collected from nature through devices such as sensors. 	North America, India and Brazil

Prepared by Hitachi Research Institute based on data from Private Sector Initiative

3.2 Reassessment of the entire social infrastructure system

Adaptation plans related to social infrastructure such as water, power and rail transport are underway in different countries, including efforts by the UK as described earlier in Section 2. Infrastructure-related companies are working together with the government to reassess the impact of climate change on the entire infrastructure system so as to devise stepwise measures from a long-term perspective. A typical case study is the initiative by Thames Water (UK) in the water sector, which aims at re-evaluating the overall water supply system by 2035 based on measures to adapt to climate change and to enhance service efficiency and quality (Table 3). This is an example of an infrastructure-related company that makes use of a long-term issue such as climate change adaptation measures to achieve a full-scale review of its long-term business strategies. Meanwhile, in the power sector, EDP Energias, a Brazilian subsidiary of Portuguese electric company EDP, employs the know-how of its parent company in Portugal to integrate a weather forecast system into the Smart Grid (an advanced electric power system) that is capable of predicting the weather in the next 24 hours by monitoring the sun rays between the clouds with a 5km² resolution. Endeavors like this to reconstruct and implement technologies developed in advanced nations according to the actual conditions and needs of emerging countries are expected to increase in the future.

Table 3: Re-evaluation of the Entire Social Infrastructure System

Company	Initiatives	Target Region
Thames Water (UK)	<ul style="list-style-type: none"> • Drafted a strategic paper for re-evaluating the overall water supply system by 2035 based on measures to adapt to climate change and to enhance service efficiency and quality. • Promotes the implementation of “flood resilience” upgrading measures by 2020. 	UK
EDP Energias (Brazil)	<ul style="list-style-type: none"> • Integrates into the Smart Grid a weather forecast system that is capable of predicting the weather in the next 24 hours (temperature, precipitation, wind direction and humidity) by monitoring the sun rays between the clouds with a 5km² resolution using a sensor network. 	Brazil
International Union of Railways (International Organization)	<ul style="list-style-type: none"> • Drafted a plan on asset vulnerability assessment and the corresponding standard measures for the railway infrastructure adaptation project. • Examines management approaches for impacts on weather, climate and natural disasters, as well as railway services performance. 	Europe, India

Prepared by Hitachi Research Institute based on data from Private Sector Initiative

3.3 Reform of financial schemes

According to PSI, many financial enterprises have developed insurance schemes for damage to agricultural crops due to climate change. For example, Sompo Japan Nipponkoa Insurance worked with Japan Bank for International Cooperation (JBIC) to develop a “weather index insurance” product, which has been offered to Thai farmers since 2010. Under the system, a fixed amount is paid to the policyholders when the Thai meteorological agency announces that the accumulated precipitation falls

below a certain level. The primary factors for its success is the introduction of a highly accurate weather index into Thailand, as well as the development of a simple product that even farmers who are not familiar with insurance policies are able to understand. HSBC also offers a similar insurance product in Brazil, while Munich Re is collaborating with a partner company to develop a climate change risk management technique, which provides high-precision data on climate change and the related damages. Moving forward, it is predicted that insurance products will become more diverse in the future.

Table 4: Financial Scheme Reforms

Company	Initiatives	Target Region
Sompo Japan Nipponkoa Insurance (Japan)	<ul style="list-style-type: none"> • Works with JBIC to develop and launch a “weather index insurance” scheme for Thai farmers. (Payout is given when the accumulated precipitation falls below a certain level.) 	Thailand
Munich Re (Germany)	<ul style="list-style-type: none"> • Cooperates with UN University and partner companies to examine climate change risk management techniques, priority order of adaptation plans, etc. • Offers high-precision data on the actual conditions of climate change and the related damages. 	Developing Countries

Prepared by Hitachi Research Institute based on data from Private Sector Initiative

4. The Importance of Public-Private Partnership Initiatives

If we look at the progress of adaptation plans on a global scale, we will find that it is led by public-private partnership initiatives between governments that have formulated an advanced national adaptation program, such as the UK, and infrastructure-related companies that work

in tandem with these public endeavors to re-evaluate their long-term business strategy. Although a similar trend is also observed in Europe and the US, strategies adopted by the UK, which can be rolled out in other countries, are garnering attention.

Meanwhile, in Japan, based on the cabinet decision on the “National Plan for Adaptation to the Impacts of Climate Change,” plans to promote cross-ministerial implementation are currently being fleshed out. In August 2016, Japan’s Ministry of the Environment launched a “climate change adaptation platform” to provide information to support the formulation of adaptation plans at the prefectural level.

As with other countries, progress in Japan is anticipated with regard to the detailed consideration of adaptation plans in the industrial arena, particularly in the areas of vulnerability assessment and the corresponding countermeasures by infrastructure-related companies for critical social infrastructure in its entirety. There is also a need for Japan to consider public-private partnership initiatives that make use of Japan’s technology and know-how to contribute toward the formulation and execution of adaptation plans in developing and emerging nations.