



Preface

Key aspects of the Paris Agreement

The COP21 conference of the United Nations Framework Convention on Climate Change (UNFCCC) negotiated and adopted the Paris Agreement. Entering into force in November 2016, this epoch-making agreement united all developed and developing countries for future climate change governance. Essential elements of the Paris Agreement closely linked to the papers in this Special Issue of *Global Environmental Research* are as follows (UNFCCC Home Page, Decision 1/CP.21).

- The 2 degree Celsius target (Art. 2)—In seeking to strengthen the global response to climate change, the Paris Agreement reaffirms the goal of limiting the global temperature increase to well below 2°C, while pursuing efforts to limit the increase to 1.5°C.
- Global emission pathways (Art. 4)—To achieve the 2°C target, Parties aim to reach global peaking of GHG emissions as soon as possible, and to undertake rapid reductions thereafter in accordance with the best available science, to achieve a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases in the second half of this century. All parties should formulate and communicate long-term low GHG emission development strategies.
- Sinks and reservoirs (Art. 5)—The Paris Agreement encourages the Parties to conserve and enhance sinks and reservoirs of GHGs including forests.
- Voluntary cooperation/Market- and non-market-based approaches (Art. 6)—The Paris Agreement recognizes the possibility of voluntary cooperation among Parties to allow for higher ambition and sets out principles for any cooperation that involves internationally transferal of mitigation outcomes. It establishes a mechanism to contribute to the mitigation of GHG emissions and support sustainable development, and defines a framework for non-market approaches to sustainable development. For this, the Japanese government has proposed a unique market mechanism called the Joint Crediting Mechanism (JCM).
- Adaptation (Art. 7)—The Paris Agreement establishes a global goal on adaptation – of enhancing adaptive capacity, strengthening resilience and reducing vulnerability to climate change. It aims to significantly strengthen national adaptation efforts, including through support and international cooperation. All Parties should engage in adaptation planning and are expected to submit and periodically update an adaptation communication on their priorities, implementation and support needs, plans and actions.

The Japanese government sets its top priority on taking countermeasures against global warming, having adopted the Plan for Global Warming Countermeasures in May 2016 to fulfill the mandate of the Paris Agreement. It sets a GHG reduction target of 26% by 2030, and long-term GHG reduction goal of 80% by 2050. The Japanese government will promote R&D of innovative technologies in the areas of energy and environment under this plan. Regarding adaptation, in November 2015 the Japanese government adopted the National Adaptation Plan as a Cabinet decision prior to COP21, and in August 2016 it established a platform called A-Plat for supporting adaptation actions under the National Adaptation Plan.

Outline of the Seven Papers of this Special Issue

In this Special Issue of *Global Environmental Research*, the editors asked Japan's top scientists and experts in the areas of climate change science and policy to review and consider perspectives in related research fields after the Paris Agreement.

First, Dr. Kameyama of the National Institute for Environmental Studies (NIES) examines key issues for academic experts to prioritize and deal with to support implementation of the Paris Agreement in the post-2020 period. She presents the overall architecture and provisions of the Paris Agreement, maps its major themes, and considers governance issues related to equity and transparency.

Second, Dr. Ashina of NIES discusses transitioning of energy systems and technologies toward achieving the Paris Agreement. In Japan, most GHG emissions come from energy consumption, so de-carbonization of energy systems is crucial and essential. Therefore he underscores the need for technological innovation in energy supply and demand to achieve the target.

Third, Dr. Masui of NIES deals with future scenarios toward achievement of the 2°C target. He introduces

controversial discussions in Japan over the past decade toward the 2°C target, and discusses what will be needed in Japan to realize the 2°C target.

Fourth, Dr. Takahashi of NIES overviews research on climate change impacts and adaptation in Japan, and explains climate risk management based on scientific evidence. Based on this review, he suggests important directions for future research on climate risks such as co-design and co-production of climate risk for decision making and strategy planning, improvement of quantification and communication of uncertainties in climate risk analyses, and so on.

Fifth, Dr. Hara and Shimada of the Center for Environmental Science in Saitama (CESS) discuss recent progress in local governmental planning for climate change adaptation, presenting a typical case in Saitama Prefecture. Some municipalities have formulated their own adaptation plan based on the National Adaptation Plan. The Saitama Prefectural Government plays a leading role in local adaptation planning and its implementation as a good practice.

Sixth, Dr. Yamanoshita *et al.* of the Institute for Global Environmental Strategies (IGES) explain Japan's new initiative for reducing emissions from deforestation and forest degradation in developing countries (REDD+). They examine a new bilateral initiative of Japan called JCM REDD+, which would contribute to REDD+ result-based finance. JCM REDD+ is a unique REDD+ activity, and to maximize its potential, modalities and guidelines for transparency and accounting related to REDD+, the Nationally Determined Contributions (NDCs), and Internationally Transferred Mitigation Outcomes (ITMOs) should be clarified under the Paris Agreement.

Lastly, Dr. Kuriyama and Dr. Morita of IGES identify factors for promoting renewable energy projects through the Clean Development Mechanism (CDM), and analyze CDM projects in China, India and ASEAN countries. This paper will be useful in applying the CDM to renewable energy projects in Asian countries.

These seven papers reviewing past research and envisioning future research after the Paris Agreement will be of great help to environmental researchers, experts and policy makers in promoting a variety of studies and surveys to achieve the 2°C target.

Guest Editor

Hideo HARASAWA

Vice President

National Institute for Environmental Studies