

Introduction

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Since the Industrial Revolution, the world community's thrive for rapid economic growth without environmental consideration has hastened the threat of environmental damages, including climate change. In the case of climate change, the world leaders have agreed on the need for a framework to deal with this issue by establishing the United Nations Framework Convention on Climate Change (UNFCCC) in March 1994. Furthermore, in December 2015, at the 21st Conference of the Parties to the UNFCCC (COP21), the Paris Agreement was agreed by consensus, ushering an era of new climate regime.

Climate change has adverse impacts on every aspect of human lives, such as health, safety, and livelihoods. Especially, the Asia and Pacific region is highly vulnerable to climate change impacts due to geographic factor and high portion of population living in rural areas. At this pace, such vulnerability from further climate change impacts in the region will increase notably because the region accounted for 91% of the world's total death and 49% of the world's total damage due to natural disasters in the last century.¹⁾

In fact, the region is predominantly agrarian; about 58% of Asian population living in rural areas is dependent on agriculture for their livelihoods.²⁾ Thus, climate change poses additional threats to rural communities that live in remote, marginal areas such as mountains, dry lands, as well as deserts with limited natural resources, communication, transportation networks, and weak institutions. Rural poverty in parts of Asia could be exacerbated especially on water sector and rice production and the increase of food prices.³⁾

In decades from now, the effects of climate change are expected to become

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¹⁾ International Fund for Agricultural Development (IFAD) (2011).

²⁾ Intergovernmental Panel on Climate Change (IPCC) (2014).

³⁾ See footnote 1.

more extreme. The temperature in the Asia and Pacific region is expected to increase by 0.5 to 2.0°C by 2030 and 1.0 to 7.0°C by 2070. The rising temperature will be more rapid in the arid areas of the northern Pakistan and India and western China. In addition, rainfall concentration is also expected to rise throughout much of the region, including greater rainfall during the summer monsoon; winter rainfall is likely to decline in South and Southeast Asia, suggesting increased aridity from the winter monsoon. The region will also experience an increase in global sea level of approximately 3 to 16cm by 2030 and 7 to 50cm by 2070 in conjunction with regional sea level variability.⁴⁾

Due to rising sea level, the impacts of these extreme events have been magnified for low-lying and coastal zone communities. There are evidences of prominent increases in the intensity and frequency of many extreme events such as heat waves, tropical cyclones, prolonged dry spells, intense rainfall, tornadoes, snow avalanches, thunderstorms, and severe dust storms.⁵⁾ The Asia and Pacific region has more than 90% of the global population exposed to them and these events pose additional risks for vulnerable communities where people suffer from poverty and strive to achieve sustainable development. Thus, the Asia and the Pacific region is substantially vulnerable to climate impacts. People residing in low-lying coastal zones and flood plains are more at risk from climate change impacts and about half of Asian urban population lives in these areas.⁶⁾

The academic journal, *Korea and the World Economy* (KWE), makes a decision to publish a special issue for the Asia and the Pacific region to explore the region's background on environment, sustainable development and various green strategies. This special issue includes three sections with seven papers.

The first section covers the importance of sustainable development issues in the Asian context. The paper overviews how the concept of sustainable development has evolved, and studies Asia's environmental situation in terms

⁴⁾ See footnote 1.

⁵⁾ See footnote 1.

⁶⁾ See footnote 2.

of economic growth and sustainability. Despite the fact that Asia-Pacific's economic growth has been rising in the past two decades, the region is facing sustainability challenges such as the rising CO₂ emissions, inequality, middle-income trap, and others. In order to pursue economic growth without undermining environment, the section stresses that Asia-Pacific needs to address the following areas: energy, transportation, urbanization, water demand, biodiversity, and climate change. In addition, the inter-linkage between economic growth and environmental degradation is emphasized, which is what the region should be aware of. As a closing, the section overviews Sustainable Development Goals (SDGs) that were passed in 2015 and then moves on to discuss how the government, international public finance, ODA, Global Climate Fund (GCF), and multilateral development banks (MDBs) can help financing to achieve SDGs.

The challenges that Asia and the Pacific Region faces include increasing demand of energy supply, rapid urbanization, lack of meeting basic energy needs, hunger, frequent extreme events, and lack of resources to adapt and mitigate effects of climate change. To tackle these climate change impacts and development challenges in the region, the second paper in this section offers low-carbon development pathway (LCDP) as a strategic method to widen economic growth and attain environmental goals together.

As one of the specific tools for the implementation, climate technology and its transfer in mitigating and adapting to effects of climate change are covered. An overview of the progress of climate technology and its transfer under UNFCCC is provided and then discussion is made on how the Global Environment Facility (GEF) has promoted in expanding the technology. The role of Climate Technology Finance Center (CTFC) managed by the Asian Development Bank (ADB) is greatly emphasized as it has contributed to promoting the introduction of climate technologies.

In Section 2, green growth strategies and frameworks are covered. In recognition of the importance of evaluating green growth performance at a country-specific level, the first paper of the section develops and introduces a tool known as the Green Growth Potential Assessment (GGPA). The tool aims

to identify green growth potentials and challenges of a country and inform the decision-makers on necessary measures to take in order to advance green growth performance. The GGPA consists of several steps, which are explicitly explained throughout the paper, that begin with an overview of a country, followed by its current condition based on the three green growth pathways (resource-efficient growth, eco-friendly growth, and climate-resilient growth), and then visual results and comparative analysis with peer countries. The paper also includes the case study for Korea and provides an overview of the country's green growth performance.

The second paper in this section highlights the importance of energy development, which is followed by the overview of the international community's assistance on energy sector for developing countries. Korea is a donor country and has been providing Official Development Assistance (ODA) consistently, but its aid on energy sector is still insufficient. The section selects four Asian countries (Cambodia, Laos, Myanmar, and Vietnam, or CLMV) based on their Energy Development Index (EDI) and then, strategies are suggested to Korea to help each of the four developing countries to increase both energy access and use through cooperation programs, which is the main purpose of this study. After analyses on CLMV's current situation on energy sector are made, the cooperation programs with Korea for each country are explained in details. The section then later advises the success factors in order to successfully achieve these four programs.

Section 3 covers specific case studies of Maldives and Korea. By using cost-benefit indicators and sensitivity analysis for Maldives, the first paper evaluates whether a hybrid system combining diesel and renewable energy power generation with ESS (Energy Storage System) is economically viable as a sustainable energy system. The result shows that a hybrid solar PV-diesel-ESS energy system is more economical for users as well as the provider, the Maldives government.

The second paper reflects Korea's performance on responding to the effects of climate change with green growth policies. Despite the fact that Korea has experienced rapid economic growth since the 1960s, its greenhouse gas (GHG)

emission has been considerably high among OECD members. In response, Korea established green growth policies in four areas (legislation, organization, budget, and policy) as well as the first and second five-year green growth plans. Further, as a specific strategy in the renewable energy sector, the strategy and the performance of Korea's Solar Photovoltaic technologies are reviewed and investigated.

The third paper in this section introduces the concepts of green growth and the overview of green urbanization. Green growth is critical in a way that it contributes to economic growth and reduction of environmental burdens in developing countries. As part of the study, Cheong-Gye-Cheon (CGC)'s historical achievements are examined, which stand as one of the successful cases in green urbanization. CGC's process of urbanization is categorized into three types (poverty-driven growth, industry-driven growth, and well-being-driven growth). Each type underwent its environmental, economic, and socio-political challenges and took appropriate actions respectively. The CGC project gives important lessons on the consideration of local conditions for effective and efficient urban green growth in developing economies.

REFERENCES

- International Fund for Agricultural Development (IFAD), *Addressing Climate Change in Asia and the Pacific*, 2011 (available at: <https://www.ifad.org/documents/10180/e2982696-e42f-41f6-af37-765e58f2076d>, retrieved on December 22, 2016).
- Intergovernmental Panel on Climate Change (IPCC), *Climate Change 2014: Impacts, Adaptation, and Vulnerability — Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*, Cambridge, United Kingdom and New York, USA: Cambridge University Press, 2014.