

## **Summary of Summaries: “Fiscal and Financial Impacts of the Climate Change and Policy Challenges in East Asia”**

This is a joint study of National Institute for Finance (NIF) in Vietnam, Korea Institute for International Economic Policy (KIEP) in Korea and JICA Research Institute (JICA-RI) in Japan. In this study, we examine observed or potential fiscal impacts of the climate change in East Asia and identifies policy challenges for the region. We then proposes policy recommendations for the ASEAN+3 countries to mitigate and reduce negative impact of the climate change. In order to reach these objectives, qualitative and quantitative (modeling) analyses is necessary to evaluate fiscal and financial impacts of climate change in East Asia. Besides, seminars, questionnaires and interview questions are also used as important methodologies of the study.

East Asia (especially Thailand, Indonesia, Philippines and Vietnam) are the most vulnerable area of the climate change due to its long sea coast, high population concentration and its dependency to agriculture and resource. The diversity of the region in geography, economy, and demography amplifies the risks of climate change impacts in East Asia. Climate change will significantly affect East Asia’s efforts for poverty reduction and sustainable economic growth. This study first analyzes regional impacts of climate change such as agriculture and food security, ecosystem, water resources, economic growth, poverty reduction efforts and social security; then focuses on fiscal and financial impacts. As fiscal and financial impacts of the climate change will likely vary across countries, case studies of member countries in the ASEAN+3 also be considered to clarify fiscal and financial impacts of climate change in East Asia.

**Climate change impacts on budget revenue can be two folds:** on one hand the reduction in productivity due to climate change (for example: agricultural productivity, reduction in tourism) may significantly reduces the economy’s

output and by this way reduce the budget revenue; on the other hand, governments can raise carbon taxes or environmental taxes, etc to mitigate the impacts of the climate change. On the revenue reduction effects, NIF (2010) estimates that real indirect tax revenue (discounted by the GDP deflator) will decrease for every region in Vietnam under the medium emission scenario (B2 scenario). Real indirect tax revenue in Mekong river delta and Central high land regions decreases the most with the magnitude of reduction is about -6% to -7%. The share of budget revenue in GDP is also reduced by approximately 1-6% in every region.

**Impacts of climate change on State Budget Expenditure** in the region are mainly assessed through climate change adaptation cost or R&D cost in response to climate change. However, evidences on the aggregate costs are rare. World Bank (2010) has estimated the global costs of adaptation (US\$70-100 billion annually out to 2050, in 2005 prices), and also produced costs for a number of individual economies, including Vietnam. The total undiscounted cost of adaptation measures in agriculture in Vietnam is estimated to be about US\$210 million per annum at 2005 prices over the period 2010-2050. Construction of sea dikes and other flood defenses for urban infrastructure and the most valuable agricultural land is separately estimated at US\$20-50 million per annum.

Given strong impacts of the climate change and the existing actions, the study identifies **key policy challenges** that could be exposed by climate change to the region, including: food security; energy security; water resources; carbon emissions reduction targets; natural disasters; social security; and adaptation decision-making in response to climate change.

Since the East Asia region is highly vulnerable to the climate change's impacts, responding quickly and strategically when disaster strikes is vital. While **adaptation and mitigation measures** are a typically recommendable policies for the East Asia as a whole as well as individual countries, **regional cooperation among the ASEAN+3 economies** is especially important to overcome the climate

change's challenges. While solutions of scientific collaboration and raising public awareness of climate change are to be done in the short-term, most of adaptation and mitigation measures to climate change in our study are considered in the medium and long terms.

*On climate change adaptation*, the East Asian region should focus on measures such as ensuring a strong growth and sustainable development; mainstreaming climate change adaptation in development planning; enhancing fiscal self-insurance; regional insurance facility for immediate needs; ensuring food security as a main task for the East Asian countries; improving management on water resources; raising public awareness of climate change and enhancing human resources; improving research ability on climate change as an important foundation for policy making process.

*On climate change mitigation*, an effective strategy should orient the East Asian region toward a low-carbon economy. To achieve that target, each individual country has to taken actions to become a low-carbon country. In addition, the GHGs emission reduction targets of the region should focus on key sectors such as energy, forestry and agriculture.

*On regional cooperation*, the East Asian countries could effectively address some climate change challenges and identify a response strategy for the ASEAN+3 countries in both adaptation and mitigation to climate change. The study assumes a hypothetical climate change fund for the ASEAN+3 region which would be beneficial for all the member countries, even after considering the burden from making the fund. In addition, it suggests that scientific collaboration should be enhanced between institutions of the ASEAN+3 countries through different forms such as workshops, trainings, scholar exchanges, and joint studies.