Study on Financial Needs and Financing Mechanisms for Climate Change Adaptation

Executive Summary

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International Institute of Green Finance (IIGF) of the Central University of Finance and Economics (CUFE)

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Amid the increasing frequency of extreme weather events such as floods, droughts, and heatwaves, both globally and domestically, socio-economic systems face growing disruptions, making it a pressing need to enhance climate risk adaptation capacity. However, the growth of funding for climate change adaptation has been slow. According to the Adaptation Gap Report 2023 released by the United Nations Environment Programme, the global adaptation finance gap has widened to an annual range of $194 billion to $366 billion. China faces a similar challenge, as the majority of its climate investment and finance is still directed towards mitigation actions, leaving a significant adaptation finance gap that public funds alone cannot bridge.

Consequently, research into the financial needs and financing mechanisms for climate change adaptation is of critical practical significance at this stage. It is crucial not only for clarifying China's required investment directions and building financial bridges to enhance societal adaptation capacity, but also for aligning economic development with the construction of climate resilience. Through a systematic review and analysis of domestic and international theories, practices, and case studies on the assessment of adaptation finance needs and the design of financing mechanisms, this study aims to delineate a methodological framework for assessing adaptation finance needs in China, explore highly feasible financing mechanisms to identify clear directions and pathways, and provide policy recommendations for relevant stakeholders to enhance the adaptation finance framework.

Global and Domestic Experiences in Assessing Financial Needs for Climate Adaptation

Assessing the financial needs for climate change adaptation is fundamental to effectively addressing climate challenges. The theoretical framework for this assessment typically involves five steps: assessing the impacts of climate change, defining adaptation goals, identifying and classifying adaptation measures, recognizing the adaptation potential of other investments, and ultimately estimating the costs of adaptation.

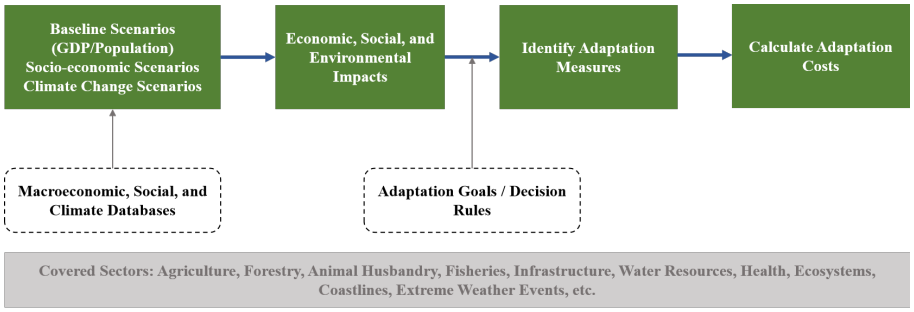


Figure: Theoretical Framework for Calculating Adaptation Costs

Source: World Bank (2010), EEA (2022), Compiled by IIGF

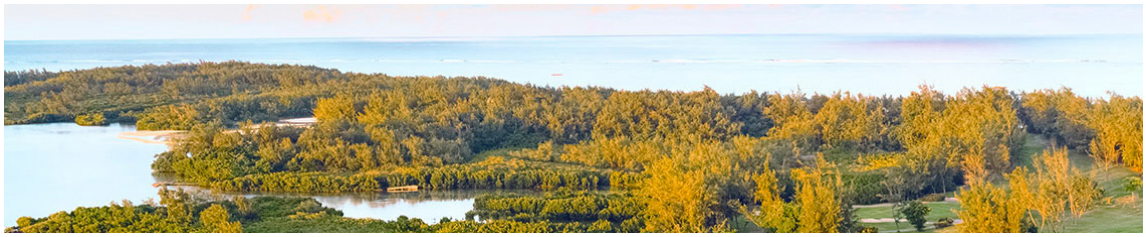
Globally, methodologies for assessing the costs of climate change adaptation generally fall into two main categories: "top-down" approaches and "bottom-up" approaches. The "top-down" methodology primarily utilizes Integrated Assessment Models (IAMs) to estimate the overall adaptation costs at a macro level, such as for the entire globe or a specific nation. This approach is often adopted by international organizations like the World Bank, the United Nations, and the European Union, as well as by developed economies. In contrast, the "bottom-up" methodology focuses on estimating the costs of specific sectors, projects, or measures, which are then aggregated to determine the total need. This method is noted for its practicality and replicability. For instance, Fiji estimates

its total needs by costing the specific measures outlined in its National Adaptation Strategy; Austria conducts its assessment by analyzing adaptation-related expenditures within its federal budget; and some Chinese scholars have calculated financial needs by estimating the adaptive fixed-asset investments required in key industries. However, both approaches face challenges. The former is sensitive to parameters and assumptions and carries a risk of underestimation, while the latter demands high data integrity and granularity and suffers from a low degree of standardization, making cross-regional comparisons difficult. These diverse practices offer valuable lessons for China, enabling it to develop and refine a needs assessment methodology for climate adaptation finance that aligns with its own national context and requirements.

Review of International Practices in Climate Adaptation Investment and Financing

Internationally, a range of stakeholders have accumulated substantial experience in promoting climate adaptation investment and financing, offering valuable lessons and references for China's own practice. Official and non-governmental international organizations, along with financial institutions, have been instrumental in promoting a standardized framework for adaptation finance. This has contributed to the initial development of standards covering the definition of adaptation finance, guiding principles, project eligibility criteria, information disclosure, MRV (Monitoring, Reporting, and Verification) processes, and associated financial instruments.

Developed economies, led by the European Union, have been actively engaged in adaptation finance practices. Through top-level designs like the European Climate Law, combined with specific policies and tools such as the Climate-ADAPT information-sharing platform and the EU Taxonomy for Sustainable Activities, they have systematically facilitated adaptation investment and financing. The EU also supports adaptation actions through a variety of financial channels, including its fiscal budget, dedicated special programs, the Cohesion Fund, and financing provided by the European Investment Bank (EIB). Furthermore, numerous innovative practices have emerged globally. For example, Glasgow, UK, has established an "adaptation measures-financial instruments" matching matrix to mobilize capital; Paris, France, has issued climate bonds to finance adaptation projects like urban greening; and the African Risk Capacity (ARC) has developed parametric insurance products linked to meteorological indices to provide member states with rapid payouts for drought disasters. While significant progress has been made, global standards for adaptation finance require further development and unification, policy frameworks need to be more widely extended to developing countries, and the innovation of financial products has yet to be scaled up.



The Current State of China's Climate Adaptation Investment and Finance Mechanisms

Given the severe reality of global climate change and the escalating impacts of climate risks, China is actively engaged in domestic and international response actions, with a growing focus on climate change adaptation and its related investment and financing mechanism. On the policy front, China has consistently advanced adaptation investment and finance through its national climate adaptation strategies as well as related policies on green finance and climate investment and financing. This has resulted in the formation of a preliminary standard system for adaptation investment and finance, providing a necessary foundation for domestic practices. During the implementation of various pilot projects, local governments have also played a proactive role by formulating local climate adaptation action plans and developing context-specific, innovative investment and financing models and tools, such as Ecological Product Value (GEP) loans, carbon sink loans, special funds, as well as insurance and derivative products. However, on the whole, the development of China's adaptation investment and financing mechanisms is still in a nascent stage. The participation of private and market-based capital is insufficient, and there remains significant room for improvement in the scale of adaptation investment and financing and the widespread adoption of related financial instruments. The overall mechanism requires further optimization and enhancement.

Policy Recommendations

In order to accelerate progress in adaptation investment and financing, China needs to address four key areas.

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• **First, accelerating the development of a financial needs assessment methodology for adaptation finance tailored to its national conditions.** This involves integrating both "top-down" and "bottom-up" models and pioneering "horizontal" and "vertical" assessment practices in key regions and sectors.

• **Second, improving the policy framework and information platform supporting adaptation investment and financing.** Specifically, this means strengthening the classification and identification of adaptation-related projects within existing green finance standards, enhancing standards for information disclosure and effectiveness evaluation, and drawing from international experience, building a national data and information sharing platform for climate adaptation to provide a foundation for financial innovation.

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• **Third, diversifying mechanisms for adaptation investment and financing.** This includes encouraging the development of national standards for adaptation-focused financial products to promote the standardization and scaling of instruments like climate bonds. It is suggested that local governments to establish special funds to leverage private capital and support the innovation of financial tools linked to ecological value, such as carbon sink loans and GEP loans, while also strengthen capacity building through the promotion of casebooks and best practices.

• **Finally, establishing a robust policy guarantee and risk management system.** This requires enhancing the assessment and disclosure of climate-related losses and encouraging financial institutions to conduct climate risk stress testing. Concurrently, China should continue to promote the application of agricultural and catastrophe insurance and foster the regulated development of risk management tools like weather derivatives to improve the climate risk management capacity of the entire society.

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