PRACTICAL APPROACHES TO FINANCING AND EXECUTING CLIMATE CHANGE ADAPTATION

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Executive Summary

There is increasing consensus that climate change may slow worldwide economic growth and could impact up to 20 percent of the global GDP in the long term, according to the Stern Review. Countries must quickly learn to calculate the risks they face and invest in adaptation measures to couple with their ongoing mitigation efforts. Developed nations will also have to help their developing neighbors adapt—and help pick up the pieces in the wake of climate-related disasters.

With these challenges in mind, a first step toward climate-compatible development is helping decision makers assess and address total climate risk. This paper presents an overview of how to estimate the costs of climate change adaptation, how to cover those costs, and practical approaches to build a portfolio of responses for any country or region.

Introduction

Around the world, countries are trying to determine how to adapt to climate change while protecting economic growth. How much adaptation will cost, and where the money will come from, are subjects of considerable debate, particularly in developing nations.

Leaders know they need to quantify adaptation costs before they can gauge incremental financing needs. But few have yet considered how to measure the impacts of adaptation efforts—a key to guide how and when funds are spent. Decision makers need more facts and support tools to develop a practical approach to make the wisest possible adaptation investments.

This policy brief offers a "top-down" global perspective on the costs of adaptation and the mechanisms for delivering funding, as well as a "bottom up" guide to assess climate impacts within a region and develop a tailored portfolio of responses.

The brief closes with a discussion about how execution is linked to overall adaptation costs and financing, which is imperative with the impending United Nations Framework Convention on Climate Change conference in Copenhagen later this year that looks to establish a binding global climate agreement among as many countries as possible. It is critical that decision makers in attendance (both public and private) are prepared to engage on the international and national stage where policy can trigger action at all levels (e.g., Bangladesh's national budget has a line item dedicated solely to climate adaptation which has corresponding effects across all subordinate budgets within the country). Research suggests that a significant portion of adaptation needs may be met through growth and development objectives being achieved in a climate compatible manner. While incremental, external financing will continue to be necessary, a broader understanding of adaptation financing approaches by decision makers will help shape the debate and lead to more informed and effective allocation.

Estimating Adaptation Costs

While it is clear that our climate is changing (i.e., 26 natural catastrophes in 1972 compared to 137 in 2008), the impacts of climate change, and the costs of adaptation, vary widely.

Experts within the scientific community disagree about numerous predictions regarding climate change, such as whether rainfall will increase or decrease in East Africa in the next 20 years. Nearly everyone agrees, however, that climate change will significantly increase the cost of economic and social development, that it will be impossible or too expensive to adapt to every aspect of climate change, and that the world's poor will suffer the most from adaptation failures.

Some adaptation is proactive, some reactive. Proactive measures include creating and sharing public goods such as drought-resistant seeds and agricultural best practices. "Climate-proofing" infrastructure and offering people new incentives for adaptation can also help prepare for climate change.

Reactive measures, taken after climate impact, include disaster management and longer-term social adaptation to prevent disasters from leading to long-term poverty. Money and supplies can help farmers re-establish their livelihoods after a cyclone, for example, and help rebuild housing or enable children to return to school.

While extensive work has been done on the impact of climate change, estimates of the cost associated with climate change are less robust. Estimates of global adaptation costs vary depending on many factors, such as assumptions about climate scenarios and funding

horizons. Estimates, in current dollars, for annual climate-proofing investments for developing countries include:

- World Bank 2006: $9-41 billion per year for developing countries based on climate-proofing public and private investment;
- Stern Review 2006: $4-37 billion per year for developing countries based on climate-proofing public and private investment;
- Oxfam 2007: Over $50 billion, including climate-proofing and national adaptation programs of action (NAPAs); and,
- UNDP 2007: $86 billion per year by 2015, including climate-proofing and social adaptation.

Since these "first-generation" estimates offer limited insight into the breakdown of adaptation needs, the UNFCCC made "second-generation" estimates for agriculture, coastal regions, health, water and infrastructure. With these sectors in mind, the UNFCCC forecasts that the world will need to spend $44-165 billion on adaptation each year by 2030. Building on that approach, Project Catalyst estimates that developing countries will need $27-78 billion per year by 2030.

Each region will require its own unique adaptation measures, of course, but decision makers will need to know more about risks, options and trade-offs before they can develop bottom-up cost estimates. Local research and adaptation planning must begin immediately, and it must account for development and climate-compatible growth.

For this to happen, developed nations will need to meet overseas development assistance commitments with an eye on the Millennium Development Goals. Failing to reach these goals will likely raise the costs of adaptation in the long run. Developing nations will need additional financing for adaptation to achieve development goals in a harsher climate even if they continue to grow at unprecedented levels and even if developed countries meet their current aid commitments.

Sources of Adaptation Funding

Considering the estimates above, it's easy to see that current adaptation funding will not meet forecast needs and is not well-suited for the least-developed countries. About $3 billion has been committed through 2012, including $300 million from the Adaptation Fund, $240 million from the Pilot Programme for Climate Resilience, $130 million from the LDC Fund, and $91 million from the Special Climate Change Fund.

Much of this funding has yet to be disbursed, and least-developed countries are often disadvantaged in accessing the money because they lack eligibility criteria or the capabilities to apply. Building their capabilities and simplifying application processes will help ensure that funding reaches more people in need.

Where the costs are additional and incremental, additional funding for adaptation will be required for developing countries. Possible funding sources include internal financing, such as national budgets, direct government transfers or grants from developed countries, "assigned amount unit" or cap-and-trade auctioning, and levies on aviation and shipping.

Project Catalyst estimates that auctioning could provide $6-38 billion per year by 2015, depending on the percentage of credits auctioned, and that transport levies could provide an additional $13-26 billion per year by 2015. A combination of these sources and others would likely be necessary to close the funding gap.

For auctioning and international transport levies to become viable sources, countries will need to make significant shifts in policy. Developed countries would need to accept limited control over these funds (as they would be raised externally to budgetary processes), and developing countries would need to accept responsibility for demonstrating that funding was productive. New institutions and governance structures would be required to manage these funds, possibly in the form of an international body representing both developed and developing countries.

Developing countries view many funders and financing mechanisms with distrust and see some conditions as unnecessary or overly restrictive. Meanwhile, donor countries need to ensure their funds are being put to good use, which requires monitoring, reporting and verification.

To overcome these challenges, many developing countries need help immediately to build capabilities so that they can use funds productively—and demonstrate success. Meanwhile, institutions and mechanisms will need to allocate and distribute adaptation funding according to actual needs. Given historical grievances on both sides, institutions will have to build trust for the system to work.

The need for adaptation funding is growing as the impacts of climate change become increasingly apparent. Existing institutions, such as the World Bank and regional development banks, may be best equipped to raise and allocate funds to those in need quickly. But the world will need to find a balance between making the most of current systems and creating an ideal system.

Practical Approaches to Adaptation Economics

While discussions continue on external financing, decision makers need to find ways to measure costs from the "bottom-up" and invest in adaptation in their countries. Currently, they lack a practical framework for evaluating local climate risk, assessing the costs and benefits of possible responses, and integrating a portfolio of such measures into their broader economic development agendas.

Societies that fail to take action on climate adaptation may have to fall back on aid in the wake of costly disasters. New thinking in this area has emerged from research by the Economics of Climate Adaptation (ECA) working group, a partnership among the ClimateWorks Foundation, European Commission, Global Environment Facility, McKinsey & Company, Rockefeller Foundation, Standard Chartered Bank and Swiss Re.

The group has proposed an approach to quantifying a location's "total climate risk." Taking today's climate into account, along with a range of future scenarios, the process uses cost-benefit analysis to assemble a portfolio of investments—infrastructural, technological, behavioral and financial—to adapt to that risk. The approach has been applied and tested through on-the-ground case studies conducted in eight distinctly different climate-sensitive regions from South Florida to Mali.

The approach is formed through five steps that begin with defining the most substantial hazards, applying scenario modeling, building a balanced portfolio of responses based on cost-benefit analysis, and then focusing on implementation and learning.

The findings from the analyses could help decision makers and practitioners reframe the way they think about adaptation economics. Five major findings have emerged from the ECA's research:

Enormous economic value is already at risk.

If current development patterns continue, the locations studied will lose between 1 and 12 percent of GDP by 2030 even *without* climate change, with poorer populations, such as small-scale farmers in India and Mali, losing an even greater share of their incomes.

Climate change could double climate-related losses in the near term.

In the eight areas studied, climate change alone could drive 45 to 70 percent of losses from total climate risk to 2030. This points to an urgent need for funding for adaptation over and above development resources.

Despite many uncertainties about the eventual effects of global warming, we know enough to make investment decisions now.

This is true even in developing countries, where data are limited. Climate change scenarios vary widely, but they can still help identify adaptation measures that would be useful against a range of outcomes.

Economies are more adaptable than some people think—so much so that most losses can be averted.

A portfolio of cost-effective measures can address most of the risks in any given region. In the locations studied, between 55 and 95 percent of expected losses to 2030—even from severe climate change impacts—can be averted through adaptation measures whose economic benefits have been shown to outweigh their costs. These include infrastructure improvements, such as new reservoirs and wells to combat drought; technology, such as better fertilizers; and systemic and behavioral initiatives, such as awareness campaigns. Risk transfer and insurance also have key roles to play in recovering losses from low-frequency, high-severity events such as cyclones and once-a-century floods.

For example in the China case study that analyzed the effects of drought in North and Northeast China, up to 50 percent of the expected losses can be covered through a balanced portfolio of effective measures, such as seed engineering and pipe water conveyance, with the vast majority being cost-effective (cost-benefit ratio < 1).

In some instances the measures identified had a negative cost-benefit ratio, meaning that cost savings exist in the long term. For example, soil conservation techniques create large cost savings from less tillage operations and fertilizer use—although their overall benefit is slightly limited by the small loss averted during drought conditions and a lack of crop yield improvement in normal conditions. Throughout all the cases that the working group analyzed, a majority of the expected losses could be averted through the use of a balanced portfolio of cost-effective measures.

Annual expected loss is a statistic that reflects the total climate risk anticipated each year through 2030. Individual regions face risk differently depending on the frequency and severity of actual events (e.g., flood) in affected areas. Therefore, the evaluation focused on a short list of measures that have a level of "loss averted" capability. Adding up the average loss averted for each measure allows decision makers to get a total sense of how much loss could potentially be averted.

The analysis shows that a large portion of the expected loss from climate change can be averted, much of it cost-effectively, if decision makers act now and implement a methodical approach to adaptation.

In the medium term, the economic benefits of adaptation outweigh its costs.

A balanced portfolio of adaptation measures can have a profound and positive impact on economic development, especially in developing countries. In Mali, for example, climate-resilient agricultural development could bring in billions of dollars in additional revenue each year. Such measures, with demonstrated net economic benefits, are much more likely to attract investment and trigger valuable new innovations and partnerships. The opportunities to target adaptation funding—and to attract investment for climate-resilient development—are tremendous and largely untapped.

The ECA's research also implies that proper reallocation of internal capital to adaptation may reduce countries' reliance on incremental, external development financing. Ultimately, incremental financing for a given country will need to take into account how much adaptive capacity is available but dormant due to suboptimal spending at the national level, and then additional financing could be a complementary resource to close the gap.

The ECA findings underscore that now is the time to invest in workable, cost-effective programs that greatly improve climate adaptation while boosting sustainable development.

Countries need to plan for adaptation with much greater rigor, focus, and urgency and do more to align public, private and NGO stakeholders. Global institutions need to build their own capabilities and those in developing countries with an eye on the social costs of adaptation and impacts on marginalized populations.

The Next Horizon

Swift policy action, continued research, and systems development by all stakeholders involved in managing climate change are particularly urgent given the ECA working group analysis. Developed nations and global institutions must continue generating financing agreements and building funding mechanisms to support adaptation in developing countries. Researchers must continue developing a fact base for measuring climate change impacts and refining decision tools for selecting adaptation responses. Local, regional, and national governments must continue developing practical approaches that can be implemented promptly.

Timing of these actions is critical due to the upcoming COP in Copenhagen in December of this year, which can act as a springboard for global change. Sizable funding for developing nations is likely to emerge from the conference, however, it is likely that this total will not cover all of the costs required to ad-

dress global climate risk, but rather lay a solid foundation that begins to address the problem.

Clearly, developing countries will require additional sources of financing to meet urgent adaptation needs—a major sticking point in international negotiations. To facilitate discussions at Copenhagen and the world stage, the Project Catalyst working group on adaptation has proposed a set of guiding principles:

- Countries should be free to be spend resources on any measures, whether focused on development or adaptation, that promote climate-resilient development;

- Funds should add to existing flows and provide a steady, predictable income stream;

- Funds should be prioritized to help the most vulnerable countries;

- Governments should have most of the responsibility for allocating adaptation funds; and

- Countries should demonstrate that funds are spent in cost-effective ways.

Progress in these areas will take us to the next horizon of adaptation: where financing is not dictated from the top but motivated by a bottom-up assessment of each country's unique needs and capabilities. This shift will occur as the world looks beyond the direct and immediate financial costs of adaptation to the long-term benefits to civilization, progress and humanity itself.

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