Designing the Green Climate Fund: How to Spend $100 Billion Sensibly

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Confronting and responding to climate change is one of the foremost issues of our time, with the burden of response spread unequally around the globe. In general, climate impacts are hitting, and will continue to hit, both developed and developing worlds. However, developing and less developed countries will be affected more quickly and emphatically than the industrialized world. Although it is widely acknowledged and provisioned under the United Nations Framework Convention on Climate Change (UNFCCC) that industrialized countries must assume a large share of the global emission reduction target, adapting to the existing and future consequences of climate change will be a greater challenge for developing countries. In recognition of this, in 2009 developed countries proposed a fund of up to US$100 billion per year to help developing countries mitigate and adapt to climate change. This

The Anticipated Effects of Climate Change on Developing Countries

Recent assessments of the impacts of climate change on agricultural production suggest a worsening inequality between wealthy and poor countries. Impacts of climate change on water quantity and quality are likely to be most severe in the arid and semi-arid tropics, and in the Asian and African mega-deltas; many countries in Africa, in particular, have a very low capacity to cope with periods of water stress. In human health the risks are greatest for the poor, the marginal, the uneducated, and the geographically vulnerable. Issues of food security, access to water, and human health are central development as well as climate change issues. Thus, integration of climate adaptation with development is essential.

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Secretary-General of the United Nations, Ban Ki-moon addresses the hall at UN Climate Talks. Cancun, Mexico, 2010 (United Nations).

funding target of $100 billion was reaffirmed and agreed in Cancun at the 16th Conference of Parties meeting to the UNFCCC in December 2010. While the funding sources included under the Cancun agreement include public, private, bilateral, and multilateral (including alternative) sources, the agreement also specifies that a significant share of new funding for adaptation will flow through the proposed Green Climate Fund (the Fund). Yet proposing and agreeing to such a fund are only early steps in what is now the difficult task of designing how such a major financing initiative might operate. The agreement poses that the institutional rules will need to meet the criteria of efficiency, equity, and equality. These rules will be critical to the success of the Fund, not only in meeting its administrative and fiduciary mandate, but in structuring the ways in which poor countries can govern for climate adaptation. In this article we focus on the question of how any such financing mechanism could be designed in ways that effectively support and enhance efforts to respond to climate change, particularly among the most vulnerable and poorly resourced countries across the globe. We do not dwell on questions of whether the amount is enough,[1] or the politics surrounding the development of the Fund, given the wide range of North–South views on both issues. We examine precedents that offer both positive lessons (what can we try to emulate?) and warning signs (mistakes to avoid), and draw from these some key recommendations for the development of the Green Climate Fund.

Global Approach, Local Implementation

While climate change mitigation has dominated international negotiations and national scale policy debates, typically framed in terms of centralized mechanisms to reduce CO_2 equivalents, climate change adaptation has no single measure and comprises a vast array of activities that are mostly local (subnational) in scale.[2] Consequently the Fund will need to distribute resources that successfully enable local institutions to undertake adaptation. In the past, hierarchical arrangements that direct external financing through key recipient government ministries have been the norm; however, the "gatekeeper" role of national governments has often hin-

The Copenhagen Accord

More than 100 countries have agreed that anthropogenic climate change should be limited to a rise in global mean temperature of no more than 2°C above the pre-industrial level, via the Copenhagen Accord (2009). The Copenhagen Accord also notes that funding for developing countries needs to be made available quickly, and at appropriate scales:

> *"Scaled up, new and additional, predictable and adequate funding as well as improved access shall be provided to developing countries … to enable and support enhanced action on mitigation, … adaptation, technology development and transfer and capacity-building …*
>
> *… to provide new and additional resources … with balanced allocation between adaptation and mitigation. Funding for adaptation will be prioritized for the most vulnerable developing countries, such as the least developed countries, small island developing States and Africa.*
>
> *… developed countries commit to a goal of mobilizing jointly USD 100 billion dollars a year by 2020 to address the needs of developing countries. … . New multilateral funding for adaptation will be delivered through effective and efficient fund arrangements, with a governance structure providing for equal representation of developed and developing countries. A significant portion of such funding should flow through the Copenhagen Green Climate Fund."(From Copenhagen Accord 2009, http://unfccc.int/files/meetings/cop_15/application/pdf/cop15_cph_auv.pdf)*

To date, work on developing the Fund has focused on sourcing revenue, rather than how to design effective ways of spending funds for adaptation. A high-level advisory group on climate financing released its final report in November 2010 and found this figure to be feasible, if diverse approaches were harnessed.[32] A transitional committee has been appointed to work on the Fund's institutional design over 2011.

dered the flow of international support to subnational scale reform for sustainable development in areas such as water management.[3] Yet direct engagement with small-scale local agencies or organizations creates high transaction costs for a large global-scale fund and is not feasible. The Adaptation Fund, a newly operational, fund financed by a levy on transactions made via the Clean Development Mechnaism, has sought to overcome this by creating national implementing entities (NIEs), national-scale institutions approved by the Adaptation Fund's board to be entrusted with the implementation of subnational projects. Three NIEs, from Senegal, Jamaica, and Uruguay, have been approved to date.[4]

Evidence suggests that international and national institutions best facilitate subnational adaptation activities when they provide knowledge, establish legal mandates, and create sustainable financing mechanisms to support adaptation by local institutions.[5] Global financing that is restricted to national government bodies may fail to engage the energy, skills, and operational effectiveness of nongovernment and subnational actors.[6]

Known Problems With Development Financing

Development financing is a complex field that has been under increasing scrutiny in recent years. Widespread failure to show tangible and lasting benefits from aid investments and expenditure, alongside well-described negative effects of donor-led structural adjustment programs on poverty and development in many countries, has generated broad investigations into aid effectiveness, on the part of donors and, increasingly, recipients.

In 2005 the Organization for Economic Cooperation and Development (OECD) Development Assistance Committee attempted to formulate the lessons from these investigations in a new agreement: the Paris Declaration on Aid Effectiveness. This statement recognized some of the fundamental flaws in conventional approaches to aid, and formalized the realization that aid effectiveness was the responsibility of both recipients and donors. It states five overarching partnership commitments[7]:

1. *Ownership*: Partner countries exercise effective leadership over their development policies and strategies and coordinate development actions.
2. *Alignment:* Donors base their overall support on partner countries' national development strategies, institutions, and procedures.

Financing for Subnational Institutions: Examples From Water and Health

Provision of water for people (as with climate change adaptation) is primarily a local affair, with services delivered by entities from the village to provincial scales. Consequently, subnational institutions have the greatest potential to understand and respond in an adequate and timely manner to local needs. Lack of local managerial and financial capacity is a key barrier to delivery of water services, a problem frequently exacerbated by the lack of devolution of responsibilities as well as obstacles in flows of funding from central governments. These barriers need to be overcome to enable local financing, improved service delivery, direct links with customers, and access to capital markets. Central governments can view subnational entities as competitors and thus hinder their access to international finance. Many existing multilateral financial institutions are constrained by their articles or policies from financing subnational institutions. The establishment or enhancement of national intermediaries to facilitate financing of local institutions on merit has been recommended, including national development banks or specialised institutions, as implemented by the Adaptation Fund's national implementing entities.[33] Similarly, in the global health sector, the Global Fund to Fight AIDS, Tuberculosis, and Malaria insists that applications for funding are signed off by a multisectoral national committee that must include nongovernment groups and representatives of people living with the diseases. This helps to connect high-level decision making with on-the-ground knowledge and local-scale implementation capacities. Importantly, however, the Global Fund also allows nongovernment applicants to bypass those national committees under some circumstances. These include lack of legitimate government; the presence of conflict or natural disasters; or where governments suppress local groups, particularly those seeking to support marginalized or criminalized communities at particularly high risk, such as drug users and commercial sex workers. This approach acknowledges that while cooperative, cross-scale arrangements are optimal, sometimes the most capable actors are not able to work effectively with national institutions.[34]

3. *Harmonization:* Donors' actions are more harmonized, transparent, and collectively effective.
4. *Managing for results*: Managing resources and improving decision making for results.
5. *Mutual accountability*: Donors and partners are accountable for development results.

Despite developing countries' strong opposition to viewing climate finance as aid (rather than as separate compensation for problems arising largely from wealthy countries' greenhouse gas [GHG] emissions), the Green Climate Fund is likely to follow the same kind of project/program model of funding prevalent in aid financing structures, so consideration of the Paris Declaration is useful in this context. It articulates the growing awareness that external financing should support wider policy initiatives developed by the recipient countries; that management, accountability, and transparency on both sides of the relationship are key to success; and that new initiatives should be flexible enough to deal with a broad range of recipient contexts.

Climate Change Governance and Politics

Development-related concerns have long been at the heart of climate change controversy—essentially that many of the most significant effects of climate change are going to be felt by those who played a relatively small part in the creation of the problem and have the fewest resources to respond to it.[8] Alongside the general concerns of aid funding and distribution noted in the previous section, there are four core challenges any development funding mechanism focused on climate change must confront: additionality, embeddedness, uncertainty, and maladaptation.

1. Additionality: As shown in our earlier description of the Copenhagen Accord, the Fund has pledged to provide *new and additional* resources to respond to climate change in the poorest

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The climate relevance of funded activities should be clear, but co-benefits to other challenges (e.g., biodiversity conservation, sustainable agriculture, etc.) should be considered an advantage rather than a disadvantage.

and most vulnerable countries. In this sense, additionality refers to financial sourcing: that revenue for the Fund should represent new commitments, rather than diverted from monies that have already been earmarked for some other form of development assistance. Increasing resources flowing to this Fund should not lead to a reduction of aid elsewhere. While this sounds straightforward, there is no accepted definition of additionality in climate finance, and the North and South have divergent and conflicting views on what constitutes additional aid. Proposals to establish a benchmark for what counts as *additional* could help—for example, any direct contribution from the donors to the Green Fund could be argued to be additional—but there really is no way of knowing whether any such contribution has resulted in declines in other aid-related commitments. Avoiding conventional multilateral government-based financing is the clearest way to overcome this problem—sourcing finance from processes that are independent from donor government budgets, and therefore are not susceptible to being "balanced" against aid budgets.

2. Embeddedness: Similarly, from the recipient perspective, improved education, better farming or forestry practices, greater institutional capacity, and improved governance are as important for health, food security, biodiversity management and conservation, and economic development as they are to climate change adoption. These are typically presented as "co-benefits." Consequently, if the requirement that *financing* from the Green Climate Fund is additional to other development funding sources is taken to also mean that the *activities* that are funded must be additional to existing development activities, this becomes challenging and some basic criteria for what are additional activities need to be agreed. If, for example, the fund requires that expenditures exclusively relate to climate change, there is the risk that it will only support specific, mostly technical interventions. If, for example, a country wanted to support a large program of mangrove replanting to build natural buffers to reduce the effect of potential storm surges, this would have the co-benefit of restoring fish-breeding habitat. If such co-benefits were not allowed, on the basis that the livelihood and biodiversity benefits should be supported by other sources, the authorities might reject the mangrove replanting and opt for artificial sea walls instead. Such an approach is clearly inefficient and counterproductive, yet may well be supported by funding rules that demand new, climate-focused adaptation projects over broad-based projects or programs with multiple

benefits. Dealing with the complex intertwining of basic development needs and resilience to climate change in ways that allow for co-benefits while still maintaining the transparency and accountability demanded by donors and publics is a core issue in climate change financing. This can be addressed by either allowing adaptation benefits to be considered and funded as an additional part of other programs, or by identifying core functions or capacities that are necessary for effective adaptation and would be fully funded despite co-benefits.

3. Uncertainty: The nature of climate change science itself also argues strongly for an integration of basic development approaches and adaptation to climate change. Although the physical climate science that describes how and why the climate is changing at the global scale is very well understood and agreed upon, there are many uncertainties surrounding projections of climate change impacts at regional and local scales that may guide adaptation actions. Given that these uncertainties are not likely to be significantly reduced in the near future, a recent synthesis of the climate change challenge has argued that "bottom-up" approaches based on reducing vulnerability or increasing resilience are often more appropriate and effective than "top-down" approaches on projections of climate change and potential impacts[9]. This further reinforces the benefits associated with embeddedness. Efforts to gather and share data and experiences regarding bottom-up approaches to increasing resilience will help to deal with uncertainties and build a repertoire of good practices to facilitate learning. UNAIDS, for example, serves to coordinate UN efforts to combat the spread of HIV/AIDS, and maintains a publicly available database of "best practices" to share lessons and experiences. Collecting and publishing these experiences is a central task for that agency.

We may continue to collectively exceed environmental planetary boundaries for humanity.

4. Maladaptation: A further challenge is to avoid maladaptation, action taken to avoid or reduce vulnerability to climate change that impacts adversely on, or increases the vulnerability of, other systems, sectors, or social groups.[10] If adaptation measures for climate change do not contribute to an *overall* environmental benefit, then we may continue to collectively exceed environmental planetary boundaries for humanity.[11] For instance, construction of interbasin water transfer schemes to adapt to climate-induced changes in hydrology will impact biodiversity and water resources. Adap-

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Mangrove trees in the tropical rainforest area of Cape Tribulation, Queensland, Australia.

tation strategies may increase vulnerability if they increase emissions of greenhouse gases, disproportionately burden the most vulnerable, have high opportunity costs, reduce incentives to adapt, or set paths that limit the choices available to future generations. Maladaptation can be minimized with appropriate laws, horizontal and vertical integrative mechanisms, and independent accountability institutions.[12] These begin with a recognition that all adaptive interventions will have costs as well as benefits that need to be tested to enhance decision making, for instance, through environmental impact assessment procedures. Management of uncertainty through incremental deployment and periodic review can identify unanticipated perverse impacts or need for changes in deployment. Periodic relicensing and reoperation of water infrastructure is one example[13]; performance-based financing, where performance criteria include maladaptive indicators, is another.

From these four issues we argue that a new climate change adaptation funding mechanism will, at a minimum, need to:

- Allow for multiple benefits. This will mean having rules that favor the projects and interventions that yield the greatest gain for their cost, even if a significant part of that gain is not directly related to climate adaptation. For example, funding the creation of a university or government department that can collect, maintain, and interpret climate data may require investment in broadband Internet infrastructure that will benefit the entire university or government. These benefits should be factored *into* the assessment of the project, and regarded as relevant additional benefits, rather than factored out. This will require transparent and specific funding criteria that ensure all partners (donors and recipients) share expectations and agree upon how climate adaptation funding may be used to support broad-based development strategies.

Adapting to freshwater shortages by building power-hungry desalination plants that are not supplied from renewable sources is highly maladaptive.

- Support collaborative approaches that can reach local scales. Ensuring that applicants consult widely and coordinate their proposals across government and nongovernment sectors, including the private sector and local-scale representatives, is important. Allowing applicants to submit proposals outside government ministries can also help to support local-scale action, especially where relationships between government and civil society organizations are not strong.
- Identify and act upon maladaptive activities. Rules for proposals will need to require that applicants consider maladaptive potential, in much the same way as environmental impact assessments are typically required to consider the social and environmental impact of a proposal and alternatives. For example, adapting to freshwater shortages by building power-hungry desalination plants that are not supplied from renewable sources is highly maladaptive.[9] It is not realistic to expect that adaptation projects have no carbon emissions associated with them; however, it is important that projects with clear maladaptive potential are avoided, and that the financing mechanism has information available to assess overall environmental and socioeconomic impacts in their funding decisions.
- Build strong national involvement and reduce financial transaction costs: The Adaptation Fund's NIEs are an innovative example of intermediate structures that can link global financing with national commitment and local action. To ensure that the skills and capacities of subnational and nongovernment institutions are engaged for adaptation, these entities should involve multiple stakeholders and sectors and invite proposals from outside national ministries. In addition to reducing the high transaction costs associated with funding by multilateral agencies, this model also builds national capacity and direct involvement.

More generally, the funding arrangements will need to incorporate mechanisms and support for monitoring and evaluation that assess real outcomes, as well as fiduciary responsibilities, where successes and good practices can be shared and understanding of effective adaptations strategies can be built. The creation of an authoritative body responsible for collecting, analysing, and sharing lessons learned as activities unfold will need to be addressed. Whether this becomes a new responsibility of an existing organization (such as the Fund itself, the IPCC or World Meteorological Organization) or demands a new institutional home (as in the establishment of UNAIDS, for example) is a debate to be had; however, the importance of this function should not be overlooked. Such institutions should be connected at national and provincial scales as drivers of ongoing management of adaptation, and may include establishing or strengthening the mandate of bodies such as auditors general, offices of technological assessment, bureaus of statis-

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A reverse osmosis desalination plant in Barcelona, Spain.

tics, meteorology, and hydrology, commissioners for the environment, state of the environment reporting, environmental regulators, and multistakeholder institutions.

Analysis: What Can We Learn From Looking at Other Financing Examples?

While the challenges laid out in the previous section are significant, there are valuable lessons that can be drawn from other funding mechanisms to inform the Fund, as the brief examples already noted indicate. Here we look more fully at three different approaches, including government-led multilateral financing, market-based financing, and public–private partnerships, and at how they manifest or have overcome the challenges presented above. Each offers different strengths and weaknesses, and we draw some key lessons across this range for designing a new financing mechanism.

Government-Led Financing: Global Environment Facility

The Global Environment Facility (GEF), established in 1991, serves as the financial mechanism for a number of conventions, including the UNFCCC. Initially the GEF was part of the World Bank but developing nation concerns about dominance by developed nations on the World Bank Board led to it becoming independent in 1994, with decision making by consensus of member states.[14]

GEF financing is limited to incremental costs for measures to achieve global environmental benefits for projects endorsed by the national governments of the countries in which they will be implemented, and where there is substantial co-financing.[15] A recent project, for example, addressed the multiple issues of energy security, energy affordability, and reduced greenhouse gas emissions in Pacific Island States, where national recipient governments and aid agencies contributed 75% of the funding and the GEF provided the 25% deemed to represent the global benefit of clean energy technologies in this project.[16] As such, the GEF shows that co-financing may provide one way to overcome the embeddedness problem noted earlier and to support multiple benefits through effective partnerships, even where those benefits are not readily observable or accountable. Indeed, the GEF has developed sophisticated processes for determining the financial equivalent for greenhouse gas benefits across a wide range of activities.

Despite the technical advances, however, as a multilateral fund the GEF has not overcome the problems associated with additionality discussed earlier. Support to the GEF is typically regarded as "aid," rather than as "environmental protection," where finance allocated to the GEF has to compete with other aid programs.[17] This not only hinders the growth of the fund, it also generates concerns over the political neutrality of the program. GEF's placement outside the UNFCCC system, with less formal control of actual decision making of projects/programs by UNFCCC parties, alienates developing countries that see it as promoting the interest of donor countries and financial institutions. For instance, World Bank loans may be combined with GEF grants, rather than

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The United Nations Framework Convention on Climate Change Meeting at COP 14 in Poznan, Poland.

being driven by consideration of the recipient governments' requirements and meeting the requirements of the UNFCCC's Conference of Parties (COP). The policies, priorities, and eligibility criteria adopted by the COP are supposed to determine GEF disbursement of funding for projects, yet critics say this is not occurring.[14] In particular, adaptation is problematic in the GEF context as adaptation investment targets

The carbon credits can be traded as Certified Emission Reduction (CER) units, equivalent to one tonne of carbon dioxide.

local impacts and associated vulnerabilities rather than generating global benefits. The little funding provided for adaptation has been limited to planning, capacity building, and mainstreaming adaptation into other GEF focal areas. Similarly, disbursement of GEF funding to projects that explicitly integrate measures that have positive outcomes in multiple environmental sectors has been recommended but not fully realized to date.[18]

The additionality problem also flows through into administration, with efforts to meet multiple demands from donors, implementing agencies, and the COP, resulting in slow and cumbersome processes. The GEF's own assessments acknowledged that "identification and approval of projects was inefficient and ineffective, and that these processes were broken beyond repair" and the "system was too complex, not sufficiently transparent, and too costly, leading to a low level of utilization in many countries."[19] Average project approval processes took four years, and reforms are being introduced that aim for approval within 22 months. The international implementing agencies have been criticized for their narrow engagement of other agencies and for their patchy performance.[20] The most recent evaluation of GEF concluded that involvement of business and civil society organizations had declined.[21]

The criticisms and failures of the GEF highlight the difficulties inherent in donor-driven, multilateral funding, and highlight that the technicalities of addressing embeddedness of climate adaptation activities pale in comparison with the political complexities of developing strong, collaborative relationships, clear accountability, and effective and transparent administration.

Market-Based Financing: Clean Development Mechanism (CDM)

The Clean Development Mechanism (CDM) is an agreement that allows countries that have made commitments under the Kyoto Protocol to meet those commitments by supporting a carbon reduction project in another country. Most typically this involves a developed country "earning" carbon credits by investing in, for example, pollution reduction or renewable energy in a developing country. The carbon credits can be traded as Certified Emission Reduction (CER) units, equivalent to one tonne of carbon dioxide.

The benefits of the market-based CDM are controversial. It is an innovative effort to overcome additionality problems by establishing an independent, tradeable commodity. Support for the projects from developed countries is in the purchasing of CERs, which then help the purchaser meet its emission reduction targets under the Kyoto Protocol. They typically do not provide aid to support the projects, so the market mechanism effectively unties support for the projects from aid. Additionality problems still do arise, however, as CDM projects are supposed to demonstrate that they are only financially viable with the additional income from CERs (i.e., that host countries could not afford to do them anyway), yet this is difficult to assess and is contested.[22]

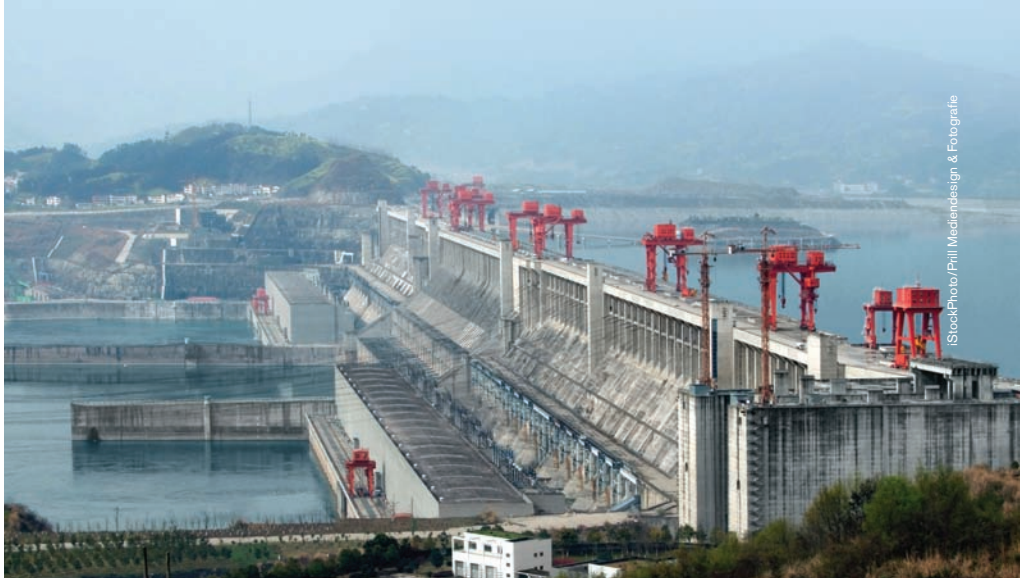
CDM projects can also effectively generate multiple benefits, such as local employment, although this is not a requirement of the program. Yet while the UNFCCC highlights the co-benefits of these projects, critics argue that the mechanism has not fulfilled its objective of contributing to sustainable development in terms of poverty reduction, employment, equality of distribution of returns, or improved air quality.[23] In

particular, the CDM has been criticized for facilitating carbon reduction projects in only a relatively small number of countries with emerging economies (as the most economically attractive CDM projects tend to be in reduction of key industrial emissions, particularly HFC23 and NO_2, and hydropower projects) and capacity to engage with international markets. In 2009, for example, China produced 55.3 percent of total CERs, and India, 15.5 percent.[24] Concerns over the inability of least developed countries to participate in this market have led to new initiatives, such as the Nairobi Framework to assist Sub-Saharan African countries, but run counter to the general idea of a market-based mechanism facilitating the most efficient carbon reduction.

Further, decision making in the CDM is shared across public and private sectors, with private-sector participants joining on a voluntary basis. Engaging the private sector is an important contribution of the CDM. However, given the nature of the market where purchasers are typically seeking large credits, there has been a tendency to prefer large projects over small ones,[25] making it difficult for local-scale, "bottom-up" participants to access the market.

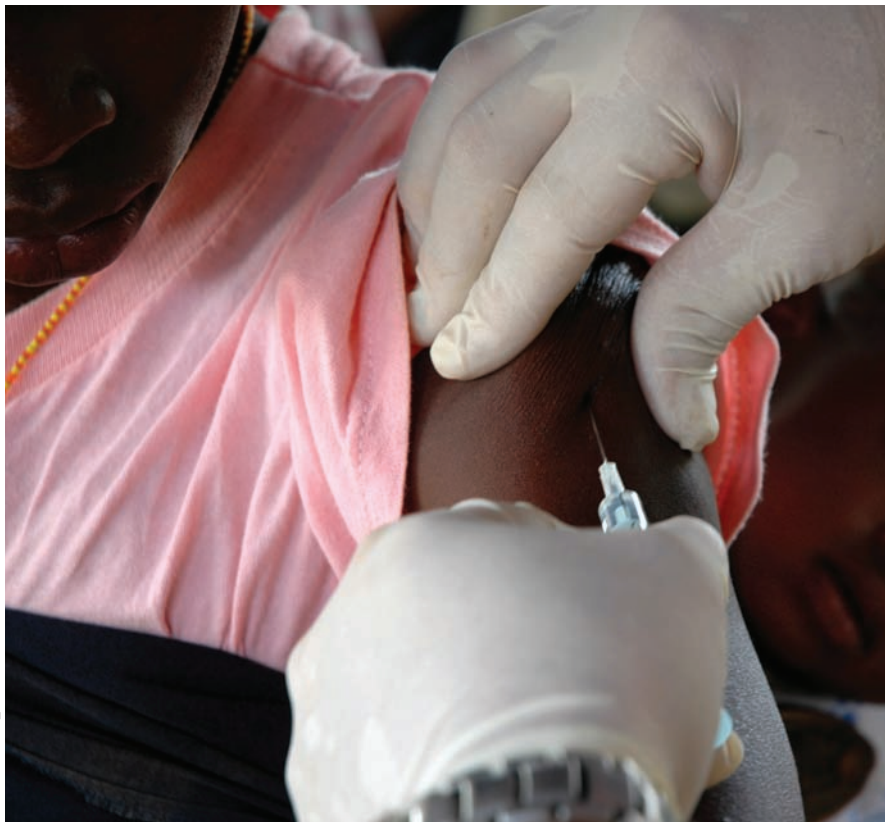
In terms of maladaptation, the singular focus on greenhouse gas mitigation and the weak or nonexistent measures to minimize perverse impacts have seen CDM projects registered that impact on other environmental sectors, including degradation of freshwater ecosystems by hydropower and forestry projects.[11]

The market-based approach, then, demonstrates that trade-based mechanisms can facilitate additional, private-sector financing for carbon mitigation. As such it represents an important institution in the mitigation landscape. However, the CDM also highlights the challenges that arise when an institution is required to meet contradictory objectives such as market-based efficiency and sociopolitical and environmental outcomes that require significant trade-offs. In the context of adaptation, this kind of market-based approach cannot meet the more complex, multifaceted



The Three Gorges hydropower dam on the Yangtze River, China.

Forestry work in Austria.



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The global health sector offers useful lessons in innovative approaches to financing.

needs for co-benefits, "bottom-up" adaptation, or avoiding maladaptation.

Public–Private Partnerships: The Global Alliance for Vaccines and Immunisation

Public–private partnerships are increasingly being viewed as offering alternatives to the government- and market-based approaches illustrated earlier. Useful lessons in public–private sector financing may be drawn from other sectors, such as global health. The Global Alliance for Vaccines and Immunisation (GAVI) was established in 2000 as a public–private partnership for increasing access to vaccines and immunization technologies in developing countries. It is an alliance between donor and recipient governments, philanthropic trusts, technical and multilateral agencies such as the World Health Organization and the United Nations Children's Fund, health research institutes, pharmaceutical companies in both developed and developing countries, and the financial sector. It aims to:

- Accelerate access to existing underused vaccines.
- Strengthen health and immunization systems in countries.
- Introduce innovative new immunisation technology, including vaccines.[26]

The strength of this partnership lies in its innovative approach to financing. An advance market commitment (AMC) is a mechanism for accelerating the development and manufacture of vaccines. Under this arrangement, donors commit to providing finance that will guarantee the price of vaccines currently in the research and development pipeline over the long term. This purchasing commitment offers security to both vaccine developers by offering a certain market, and to the countries that may benefit from its implementation by establishing an affordable price and distribution. The AMC has been criticized for lack of transparency, particularly in how it negotiates and sets the relevant prices,[27] but remains an innovative approach to using aid-based subsidies to leverage private-sector engagement. This kind of approach is suitable where up-front costs are large but will decline with long-term commitments. Comparable areas in climate adaptation may include the development of new crop varieties that are more resilient to climate variability, where the lack of established markets discourages private companies from pursuing the technology.

GAVI also initiated the International Finance Facility for Immunisation. This facility takes legally binding pledges from donor governments over a 10- to 20-year time frame, and uses them to raise immediate capital by issuing bonds on international finance markets. Since 2008 GAVI has raised over USD 3.6 billion through this facility. This strategy again enables GAVI to guarantee long-term commitments to recipient countries and to vaccine manufacturers, enabling GAVI to negotiate lower prices; it also allows GAVI and its implementing partners to "front-load" the expenditure, while allowing donors to provide smaller contributions over a longer time frame. In the climate context, partnerships between public agencies and insurers to issue so-called "catastrophe bonds" to spread insurance risk[28] and green bonds for mitigation projects are being developed along similar lines.

More broadly, public–private partnerships can be used to develop new ways of financing, according to the particular issues at hand. GAVI demonstrates innovative financing possibilities offered by public–private partnerships in generating co-benefits by harnessing the private sector in both product development and financing to achieve public good goals. It does not overcome problems of additionality, as it fundamentally relies on donor contributions, or problems of maladaptive potential. In some respects it can exacerbate the problems of justifying public

financial contributions, as controversies over evidence of the effectiveness of some programs has led critics to ask whether it is simply subsidizing pharmaceutical companies for no clear health gain.[29] However it does have the potential to generate multiple benefits, including both public and private gains, and to improve private-sector capacity in developing countries. Consequently, this particular form of partnership requires an active and engaged private sector, typically with a strong interest in climate adaptation, and so will only apply to some activities. It could also apply to some mitigation activities. Efforts to support the development of a competitive renewable energy sector in countries with only small energy infrastructures could benefit from this kind of partnership, for example.

Conclusions

These examples are not intended to be exhaustive, but to indicate the value of looking at other global financing models to help inform the design of the Green Climate Fund. It is crucially important that the shortcomings of our existing climate change-related institutions are not simply replicated for the sake of expediency or for lack of serious consideration of the many alternatives. The essential operating mantra of the Fund needs to be to avoid potential conflicts in objectives, prioritize transparency and accountability, and prioritize developing strong, collaborative relationships and organizational structures. More specifically, from this analysis we propose that:

- The climate relevance of funded activities should be clear, but co-benefits to other challenges (e.g., biodiversity conservation, sustainable agriculture, etc.) should be considered an advantage rather than a disadvantage. The fund could explicitly seek to support measures with co-benefits across sectors, in particular, that concurrently support implementation of a number of multilateral agreements. This would require the UNFCCC to collaborate with other relevant institutions in establishing the fund.[30]
- The fund rules should appreciate that all interventions have costs and risks as well as benefits, and seek to ensure that project proponents assess the costs and risks so as to make informed decisions on trade-offs and avoid maladaptation.
- Given the range of climate impacts that are already in existence, the Fund should be able to support a range of projects and programs with on-the-ground impacts. For instance, key adaptation tasks and projects already listed under national action plans for adaptation deserve immediate attention.
- Principles and practices that support full ownership by recipient countries in the project/program design will be important. Projects and programs must meet the national context of participating countries, preferably through cross-sectoral (government, nongovernment, and private sector) engagement at the country level.
- The fund rules need to reflect the understanding that adaptation is embedded in society and usually occurs at subnational scales. Consequently, the financial viability, carbon emission reduction, and global importance additionality tests applied in other global climate response measures are not appropriate to this fund, and mechanisms should be agreed that enable subnational institutions to access funds on merit. Examples such as the Adaptation Fund's National Implementing Entities can be adjusted to make sure the concerns of subnational institutions are addressed.
- Given the wide variance in capacity across vulnerable countries, poor governance must not be used as an excuse for reducing or stopping funding entirely. The fund should be designed to ensure that such countries are supported to build their governance capacity, for example, through partnerships with nongovernment or UN agencies.
- Administrative mechanisms are required that are flexible, fast, and transparent. Rigorous, independent technical assessment would help to separate project approvals from the political representatives on, for example, an executive board.
- Investments in operational research should be strongly encouraged, systematically collated, and made available in timely and positive ways. Collections of good practices and lessons learned will boost learning and accelerate effective adaptation responses.

We will need to consider the specific challenges of climate change adaptation, and develop innovative responses to them.

While it may seem that raising $100 billion per year to tackle climate change is a mammoth task, designing institutions that can spend these funds in ways that are effective and efficient and that demonstrate commitments to equity will require a delicate balance between sensitivity to the global ethical challenges, and drive and commitment to see the fund operating quickly. This may prove to be even more demanding, and more important in the longer term. Researchers and policymakers alike need to look beyond the environment sector to seek out innovations from others, illustrated by GAVI here in global health, but by no means limited to that one organization. We will need to con-

sider the specific challenges of climate change adaptation, and develop innovative responses to them. Ensuring that these institutional arrangements meet the challenges we have documented and can learn from unfolding experience is crucial to ensuring that the poor and vulnerable are served by the global community.

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NOTES

1. UNDP's 2007 World Development Report, for example, calculated US$86 billion for adaptation in developing countries alone (UNDP, 2007. *World Development Report: Fighting Climate Change: Human Solidarity in a Divided World*. UNDP). The UN Economic Commission for Africa uses an estimate of US $150 billion (UNECA, 2009. *Policy Brief: Financing Climate Change Adaptation and Mitigation in Africa: Key Issues and Options for Policy-Makers and Negotiators*. http://www.uneca.org/adfvii/documents/FINALPolicyBrief_FinancingCC130509.pdf).

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4 http://www.adaptation-fund.org/accreditedNIEs (Accessed 14/2/2011)

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6. Means of evaluating successful cross-scale adaptation interventions have been proposed based on elements of effectiveness, efficiency, equity and legitimacy, also responsiveness. See N. W. Adger, N. W. Arnell, and E. Tompkins, 2005, "Successful Adaptation to Climate Change Across Scales," *Global Environmental Change Part A*, **15**(2): 77–86; also A. Möhner and R. J. T. Klein, 2007, *The Global Environment Facility: Funding for Adaptation or Adapting to Funds?*, Stockholm Environment Institute, Stockholm.

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15. While it may seem logical to suggest the GEF should be given a central role in the Green Climate Fund, given its relationship with UNFCCC, it is designed specifically to support global-scale benefits, so any effort to include adaptation within its mandate (with its very local benefits) would require a major overhaul of the facility and its fundamental purpose. See A. Möhner and R. J. T. Klein, 2007, *The Global Environment Facility: Funding for Adaptation or Adapting to Funds?*, Stockholm Environment Institute, Stockholm, and M. Mace, 2005, "Funding for Adaptation to Climate Change: UNFCCC and GEF Developments Since COP-7," *Review of European Community & International Environmental Law*, **14**(3): 225–246. See also note 13.

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