5. Conclusions and Recommendations

Conclusions

5.1 Climate change makes development more expensive, complicated, and uncertain than was thought. Climate has already changed in ways that impose costs—for instance by making rainfall more variable. Although climate change may open some local opportunities, its global costs will swell in coming decades. People and governments will spend resources defending themselves against risks that include more extreme weather, greater risks to agriculture, coastal inundation, spread of disease vectors, and ecosystem disruption. Some damages will not be preventable, adding to costs. Contingencies for “wild card” outcomes—such as accelerated sea level rise or storm incidence—must increasingly be contemplated, given the unchecked growth in global greenhouse gas emissions and the looming possibility of a 4°C rise in temperature (relative to pre-industrial times) by century’s end.

5.2 Adaptation to climate takes different forms. First, adapting to today’s climate (which in part has been shaped by human actions). The gap in crop yields between developed and developing countries, and the disparity in deaths from disasters, underlines the importance of building resilience to today’s climate variability. Adaptation to today’s climate yields immediate benefits and often helps build resilience to ongoing changes. Second, anticipatory adaptation to transformative changes such as sea level rise or glacial loss. This might require bearing costs today to keep future options open or to reduce the cost of future catastrophes.

Addressing Current Climate Variability

5.3 Even the Bank Group’s explicit adaptation efforts have largely been to support activities that address current climate variability. Projects and CASs that address climate adaptation have focused on today’s climate challenges, including disaster risk management, water management, sustainable agriculture, and improving hydromet systems. These efforts address urgent development priorities and yield immediate benefits.

5.4 Similar past efforts—projects that boost resilience to current climate conditions—often appear to be successful, though evidence is spotty. Limited evidence suggests that sustainable land management projects boost yields and incomes. The Productive Safety Net Project in Ethiopia has reduced climate-related food insecurity; similar impacts of a Kenyan drought mitigation and relief project have been harder to demonstrate, though there has been institutional development. Flood control projects have largely achieved physical goals and would be expected
to reduce vulnerability. Recent innovations in financial risk management at the national level have been well received by clients. Results have not yet lived up to expectations for household-level weather index insurance, however. Investments in hydromet systems are plausibly argued to have high economic returns, though rigorous measures are lacking.

5.5 These efforts would mostly be expected to be robust (no-regret) projects that also boost resilience to future climate patterns, regardless of how they unfold. This is particularly true of projects that boost institutional capacity (providing greater capability to deal with an uncertain future), and projects that boost household incomes and assets (buffering them against future climate shocks).

5.6 Would-be no-regret efforts may, however, be unsustainable or maladaptive. Physical and financial sustainability are one hurdle. Mangrove plantations have been torn up when conversion was more attractive to locals than conservation. Drainage systems have clogged and failed from inadequate maintenance. Drought relief systems do not work when funding dries up. Lack of ecological sustainability is another hurdle. Tree planting may end up drawing down aquifers rather than recharging them, as studies suggest has happened in the Loess Plateau. Support for short-term coping could conceivably hinder outmigration from places doomed to inundation or desertification. This suggests the need to root ACV activities in longer-term plans, and to monitor for unexpected maladaptive outcomes.

ADDRESSING TRANSFORMATIVE CHANGE

5.7 The World Bank Group—and others—are only beginning to assess how and when to invest in investments that anticipate transformative change. The Bank Group has invested in analytic studies that look regionally at long-run climate impacts, for instance in the Andes, Zambezi Basin, the Amazon Basin, and the Sundarbans. Some impacts of climate change are not easily predictable. Precipitation, for instance, is highly uncertain in many areas, complicating anticipative adaptation to river basin management. But for other aspects of climate change, such as sea level rise and rises in mean temperature, the broad trends are reasonably well understood though their timing is uncertain.

5.8 Land-use planning makes sense as an adaptation measure that anticipates predictable long-term changes. Over this century, the population of coastal areas and floodplains will swell by billions, increasing overall vulnerability to sea level rise, storm surges, and floods. At the same time, rising temperatures will induce ecosystems to shift. But plant and animals species will be unable to migrate if the way is blocked by intensive agriculture or urban development. These climate-driven trends motivate the use of information, incentives, or regulations to shape spatial
patterns of land use. However, it is politically and operationally difficult and there are few successful examples in Bank Group (or other) experience. Nonetheless, new approaches are underway and should be monitored closely.

**BANK GROUP-LEVEL LESSONS**

*Incorporating Climate Change Risks into the Design and Appraisal of Bank Group Projects*

5.9 Operational procedures for identifying and mitigating climate risks are not standardized at the World Bank Group. The new (2012) IFC Performance Standard 1 specifically requires screening for adaptation opportunities. However, neither the IFC nor the World Bank has yet set up systematic procedures for screening projects for climate risks. In two sectors whose long-lived objectives are subject to climate risk—hydropower and protected areas—practice was inconsistent in identifying and mitigating those risks. The lack of guidance on integrating climate risks into project design is a general issue, not restricted to the Bank Group\(^47\). Without guidance on how to do this, project designers may under- or over-invest in climate risk analysis and in exploring options for resilience.

5.10 Downscaled climate models have so far proven to be of limited operational use for planning at the Bank Group. Global climate modeling is essential for understanding the climate system and has been critical for assessing mitigation policies at the global level. It has been natural to turn to these models for policy and project guidance concerning climate risk. Analytic projects at both IFC and the World Bank have done so, often innovatively. For the most part, these exercises have yielded such a wide span of projections that their authors have defaulted to “no-regret” recommendations that are robust to climate outcomes. This suggests greater emphasis at the Bank Group to methodologies for robust decision making—that is, the choice of policies and projects that are flexible and resilient—relative to climate modeling.

*Strategic Guidance, Tracking Results, and Pursuing Effectiveness in Climate Adaptation*

5.11 The SFDCC elevated the profile of climate adaptation in country and regional strategies, sparked exploratory analytic work, and witnessed the mobilization of funds for the PPCR. A wide-ranging exploratory approach was appropriate at this initial stage.

5.12 Now, however, the Bank Group lacks a reliable compass to guide future adaptation efforts. Results frameworks under the new Environment Strategy and from the SFDCC close-out are based on indicators that don’t represent the range of adaptation issues, are sometimes only tenuously related to resilience, and when relevant tend to focus on inputs. The World Bank and IFC have developed, in response to an IDA mandate, procedures for tracking projects with climate
adaptation “co-benefits.” The system tracks inputs (spending on projects with climate co-benefits) and intermediate outputs (such as project beneficiaries or hectares with improved agricultural practices), rather than outcomes or impacts. Total spending on climate adaptation–related projects, by this measure, is likely to be used as a measure of adaptation progress for lack of an alternative. But this is an unsatisfactory yardstick because it highlights expenditure rather than results; mixes incommensurable expenditures (policy loans, investment loans, and technical assistance); fails to assess where there are tradeoffs, and where complementarities, with poverty reduction; and ignores the likely adaptive impact of rural roads, female education, urban employment generation, and other interventions that at first glance seem extraneous to climate.

Project-level monitoring and evaluation often is inadequate, leaving knowledge gaps on the efficacy and cost-effectiveness of interventions. This evaluation could find relatively little gender-related information on impacts. Box 5-1 gives a few examples of the many critical questions whose answers could guide project and portfolio design.

<table>
<thead>
<tr>
<th>Box 5-1. Some Things We Need to Learn to Promote More Effective and Equitable Adaptation</th>
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<tr>
<td><strong>Poverty reduction, assets, and resilience:</strong> As household incomes improve and diversify (from different kinds of projects and policies, in different contexts), to what extent do households become more climate-resilient?</td>
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<tr>
<td><strong>Sustainable land and water management projects:</strong> What is their impact, under different conditions, on groundwater recharge, agricultural yields, and carbon storage?</td>
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<tr>
<td><strong>Index-based agricultural insurance:</strong> How much does it improve household consumption and resilience?</td>
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<tr>
<td><strong>Ecosystem-based adaptation:</strong> Are these interventions (such as mangroves for coastal protection, wetlands for flood mitigation) sustained? If sustained, do they achieve their adaptation goals?</td>
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<tr>
<td><strong>Land use planning and zoning:</strong> Are plans being complied with? What is the impact of alternative enforcement and incentive approaches? What are the costs and benefits of different approaches: information provision, permitting, and incentives?</td>
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<tr>
<td><strong>Costs and benefits of flood control and other disaster prevention efforts:</strong> What are the costs and benefits of achieving different levels of protection via different means?</td>
</tr>
<tr>
<td><strong>Costs and benefits of improved hydromet systems:</strong> What are the costs, who benefits, and by how much?</td>
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Source: IEG.
THE ROLE OF IFC
5.14 IFC is striving to define its role in climate adaptation. It is a truism that most adaptation will be undertaken by the private sector, yet it has been difficult to identify business and development opportunities. IFC is exploring options in insurance and in stress-tolerant seeds, both of which are potentially large and relevant markets with emerging technologies. A potentially important role for IFC is through indirect channels, such as support for non-farm employment in rural areas. (See Box 2-1.)

NATIONAL-LEVEL LESSONS
5.15 A handful of pioneering countries provide lessons for integrated national planning and implementation of climate adaptation. These include:

- ACV is perceived as most urgent. Dealing with current urgent climate risks has generally taken precedence over longer-range ACC.
- Concurrent planning and execution: Theoretically, it would make sense to follow a sequence of vulnerability assessment, capacity-building, planning, and implementation. But achieving visible results was necessary to maintain motivation and engagement in the Caribbean and Kiribati, and also provided an opportunity for feedback and learning.
- The need for focus. Projects initially tried to cover too broad a range of issues, inefficiently fragmenting efforts and straining limited capacity. It appears to be desirable to focus initially on just one or two sectors or issues.
- The need for a strong coordinating agency. This is especially true for smaller countries where adaptation funding may be large relative to the traditional development assistance with which it needs to be meshed.
- The need for long-term engagement. Progress has been made in sequences of projects that span a decade or more.

GLOBAL PUBLIC GOODS AND ADAPTATION
5.16 For the most part, adaptation is an activity with local benefits. But there are some global public goods related to adaptation:

- Climate information is one. Because weather has no boundaries, a country’s hydromet data can help improve its neighbors’ weather forecasts, flood warnings, and climate projections. The Bank Group has created a global public good in the form of its Climate Portal. While this provides useful information, it is not clear that the Bank Group is the institution best suited to mount this kind of effort. On the other hand, the Bank Group could play a catalytic role in encouraging the creation and global sharing of hydromet data.
Another is the conservation of agricultural biodiversity and the advance development of crops and animals with characteristics useful for agricultural adaptation in a wide variety of environments. While it is difficult to predict with precision crop needs for a particular spot on Earth, it is very likely that many places will need drought-tolerant and heat-tolerant crops. It is also likely that emergent pests will eventually target existing crop varieties, so the ability to rapidly develop pest-resistant varieties is needed. The Bank Group has played an indirect role in this via its support for the CGIAR.

A global system of comprehensive disaster insurance is lacking. This is a task far beyond the resources of the Bank Group, though it could play a coordinating or convening role in addressing this gap.

Recommendations

GENERAL CONSIDERATIONS

5.17 Climate adaptation will be advanced, to a large degree, by pursuing sustainable development, especially sustainable agriculture, integrated water resource management, and disaster risk reduction. These lines of action, already existent at the Bank Group, provide immediate development benefits and can increase current resilience. They are even more valuable in the face of climate change, because they build up the physical and institutional basis for future resilience. Institutional capacity building is a robust foundation for adaptation to a highly uncertain future.

5.18 Pursuit of sustainable development requires attention to intersectoral and spatial linkages, environmental externalities, social inclusion, and systems for rapidly detecting and diagnosing problems (World Bank 2002). IEG’s Environment and Sustainability evaluations have stressed the need for upstream attention to these issues in sectoral strategy and project design.

SPECIFIC RECOMMENDATIONS

5.19 A strategic challenge is to maintain a focus on achieving resilience, while fully mainstreaming adaptation into the practice of development. Many activities can legitimately claim adaptation “co-benefits,” though to varying degrees. Some seemingly unrelated interventions may have powerful adaptation benefits—for instance, policies that remove barriers to rural-to-urban migration. An input-based strategy—one based on assumptions about adaptation benefits, rather than actual results—is almost certain to be inefficient. For this reason, IEG’s recommendations revolve around building a results framework that provides strategic guidance and enhances learning in this new endeavor.
5.20 **Recommendation 1:** Develop reference guidelines for incorporating climate risk management into project and program design, appraisal, and implementation. These guidelines are not meant to be rigidly prescriptive but rather to provide guidance on appropriate levels of due diligence for activities of different size, flexibility and longevity, recognizing operational differences between World Bank Group institutions. The guidelines, tailored to project types or sectors, would include relevant risks to be assessed; guidance on available risk assessment tools including their strengths, limitations, and applicability; and options for integrating climate risk considerations into design and implementation. The World Bank Group could use its convening power to assemble climate scientists and industry experts to draft these guidelines, creating a network that would deepen and refine the guidelines over time and might help disseminate them to other interested groups.

5.21 **Recommendation 2:** Develop and pilot territorial and national-level measures of resilience outcomes and impacts for inclusion in an improved results framework. Current and proposed national-level indicators are only weakly tied to resilience, or measure inputs rather than outcomes. To track progress, the Bank Group should mobilize resources and collaborate with national and international partners to create more sensitive and useful indicators that capture the following dimensions:

- *Institutional measures of adaptive capacity*—including the status of hydromet systems, disaster relief management systems, and agricultural extension systems; and the geographical coverage of vulnerability assessments
- *Household measures of vulnerability and exposure:* based on household surveys that combine information on exposure to climate and other shocks with measures of consumption or food insecurity
- *Biophysical measures of resilience:* such as measures of water use sustainability and of recurrent urban flooding. This could be an area for South-South cooperation, given increasing expertise of developing countries in remote sensing.

Baselines should be established for these indicators, which are intended for ongoing monitoring. These indicators should be refined and improved over time as knowledge of adaptation deepens.

5.22 **Recommendation 3:** Better assess the costs, benefits, sustainability, and impact of activities with presumed resilience benefits. As sponsor of billions of dollars of activities related to adaptation, the Bank Group is in a unique position to pool knowledge to increase its own and clients’ effectiveness in pursuing climate
goals. Box 5-1 lists, as examples, some issues where rapid shared feedback could directly improve effectiveness in pursuing adaptation and development goals. The Bank Group could develop this knowledge in part by piloting approaches to integrating impact evaluation into selected projects with potential adaptation benefits. Experience in the human development sector shows that an offer of funding for impact evaluations finds takers and generates useful knowledge. To be most effective, monitoring protocols should be integrated with project monitoring and evaluation from the start, and should include provisions for comparison or control groups. Rigorous ex ante assessment, along with attention to intermediate outputs, should be used for activities whose impacts are not readily observable in the near term, such as those aimed at reducing vulnerabilities to long-term climate change or to low-probability catastrophic events.

5.23 **Recommendation 4: Support countries to improve hydromet services and encourage the use and sharing of hydromet information within and between countries.** Prioritize Sub-Saharan Africa and other low-income countries and regions with poor system coverage and low use of services. Support countries to pilot policy reforms and financing models that promote long-term maintenance and a greater array of hydromet products that are accessible and valuable to end users.

5.24 **Recommendation 5: Promote attention to anticipatory adaptation to long-run climate change.** Specifically,

i) Where coastal zone management, estuaries and deltas, cities exposed to climate risks, regional agricultural development, and national biodiversity strategies are a focus:

a) in the context of country assistance/partnership strategies, signal the need for attention to patterns of spatial development that are resilient to long-run climate change

b) in the context of large-scale projects and programs, include assessment of the feasibility, costs, and benefits of alternative policy instruments for shaping long-run climate-resilient patterns of spatial development

ii) Promote learning on policy instruments for shaping long-run climate-resilient patterns of spatial development, including through small-scale pilot projects, assessment of ongoing projects, and other analytic activities.

5.25 In addition to these recommendations, IEG suggests attention to the following areas.
• Continued support for integrated river basin management, especially for large transboundary basins. Keep in mind that progress may take decades, and support the development of open-source hydrological data and models.
• Support for in situ conservation of agrobiodiversity.
• Working with partners, exploration of means of assuring reliable financing of responses to major disasters.