



Building Resilience

Integrating Climate and Disaster Risk into Development

The World Bank Group Experience



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Foreword

Weather-related events hurt rich and poor countries alike. They can slam the brakes on economic growth and cripple markets. But how we fare after disaster strikes depends very much on where in the world we live, and how. The more vulnerable and less prepared our nations, communities and households are, the more we suffer. If we live in coastal or water scarce areas, on steep slopes, the more we are at risk. If our house is made of sturdy materials, the less we are likely to be affected. However, if we are poor or we live in a poor country, the more likely we are to lose our lives.

As the global climate continues to change, developing countries face mounting losses from severe floods, droughts and storms. By 2030, there could be 325 million people trapped in poverty and vulnerable to weather-related events in sub-Saharan Africa and South Asia. Large coastal cities, many of them in growing, middle-income nations, could face combined annual losses of US\$1 trillion from such events by mid-century.

This report shows why building climate resilience is critical for the World Bank Group's goals to end extreme poverty and build shared prosperity—and why it should be front and center of the development agenda. Unless we help vulnerable and poor nations, regions and cities prepare and adapt to current and future climate and disaster risks, we could see decades of development progress rolled back. By focusing on the Bank's experience in climate and disaster resilient development, we hope that this report will also contribute to international discussions related to understanding loss and damage from climate change.

This report calls for the international development community to work across disciplines and sectors to build long-term resilience, reduce risk and avoid climbing future costs. It emphasizes the necessity of building and empowering institutions for the sustained effort needed for making development climate and disaster resilient. And by highlighting best practices, it shows how financial instruments and intervention programs, along with disaster preparedness expertise

developed over decades, are already helping nations prepare for a more changeable world.

However, let us not fool ourselves that doing this will be easy. Resilience is effective, but it often requires a higher initial investment. Our experience shows it costs up to 50 percent more to design and build safer buildings and infrastructure after a disaster. State-of-the-art weather warning systems require new technology and highly trained staff. Relocating people from unsafe areas is expensive and can bring cultural and social disruptions, which can create new risks. We know that communities with strong social bonds are more resilient when disaster strikes as neighbors are the first responders and can help each other in the process of reconstruction.

At the World Bank Group, we believe that climate-related disasters can be reduced and investment costs curtailed. But this requires us to work across disciplines with different partners to make climate and disaster resilience part of our day-to-day development work.

The good news is, many of these interventions make sense for development and they help all of us—developing and developed nations alike—prepare for a warmer and more unpredictable world.

We know what to do. Our job now is to ramp up efforts to get ahead of disasters to save lives and protect livelihoods. We need to get beyond disasters and help countries and communities build resilience in the face of a rapidly warming world.



Rachel Kyte
Vice President
Sustainable Development Network
The World Bank Group

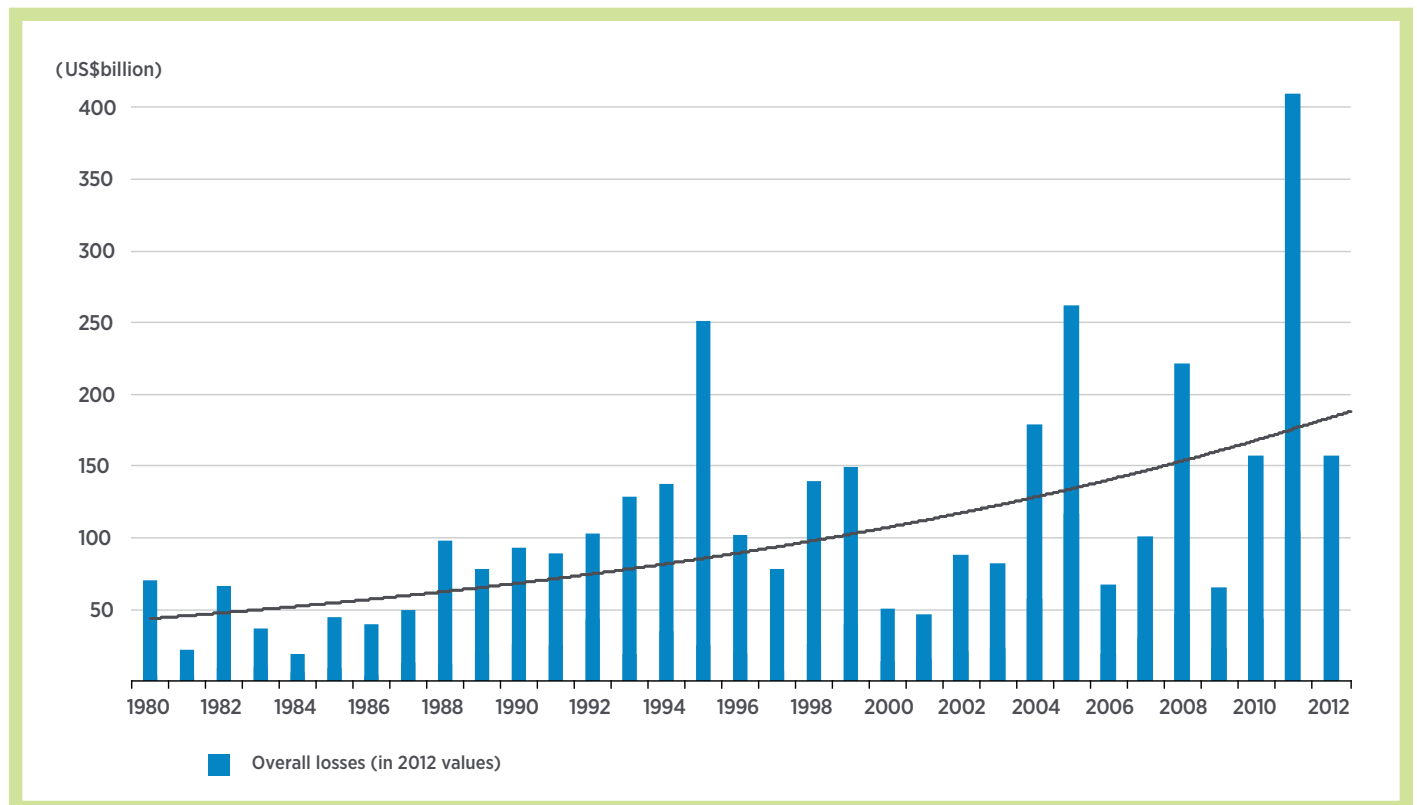
November, 2013

Executive Summary

This report presents the World Bank's experience in climate and disaster resilient development, and contends that such development is essential to eliminating extreme poverty and achieving shared prosperity by 2030. The report recognizes, however, that such development requires additional start-up costs, which pay off in the long run if done correctly. Given this, the report argues for

closer collaboration between the climate resilience and disaster risk management communities, and the incorporation of climate and disaster resilience into broader development processes. Selected case studies are used throughout this report to illustrate promising approaches, lessons learned and remaining challenges.

Figure A: Global disaster losses from 1980–2012



The bars indicate annual disaster losses. The line indicates the trend.

Source: © 2013 Münchener Rückversicherungs-Gesellschaft, Geo Risks Research, NatCatSERVICE (as of January 2013)

The report aims to contribute to the loss and damage discussions under the United Nations Framework Convention on Climate Change, and is targeted at development practitioners and national policy makers who face the challenge of addressing a potential increase in disasters caused by gradual changes in climatic means and extremes.

From 1980 to 2012, disaster-related losses amounted to US\$3,800 billion worldwide (Figure A). Some 87% of these reported disasters (18,200 events), 74% of losses (US\$2,800 billion) and 61% of lives lost (1.4 million in total) were caused by weather extremes (Munich Re 2013).

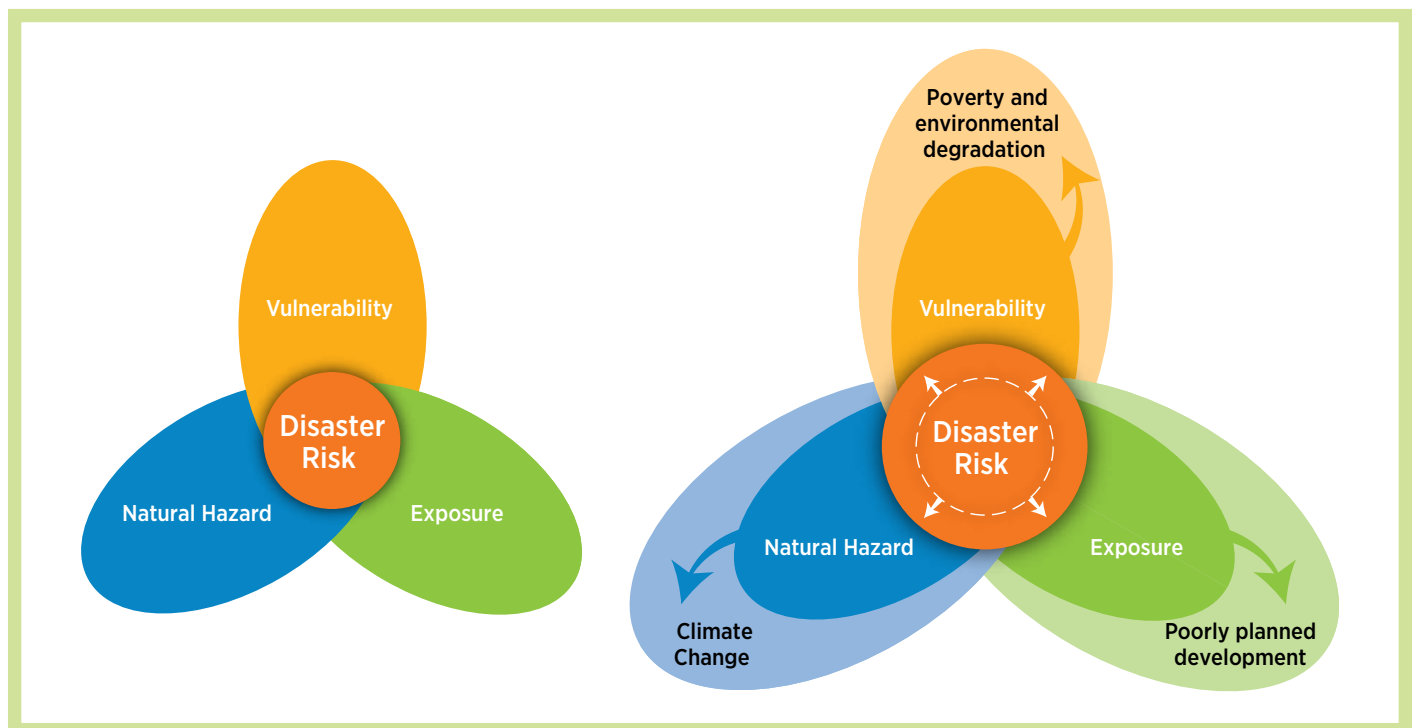
Development patterns, particularly population growth in high-risk areas and environmental degradation, continue to be the most important drivers of disaster risk (IPCC 2012). However, since the 1960s, human-induced climate change has been increasingly contributing to extreme events in the form of rising temperatures (such as warmer spells and heat waves), changing precipitation patterns

(e.g., flash floods) and sea storms (IPCC 2013). For example, land areas affected by heat waves are expected to double by 2020 (World Bank 2013a).

Attributing causality of disasters to climate change remains intrinsically difficult due to the uncertainties, and complex and dynamic interactions between development patterns, the environment and the climate (all of which contribute to disaster risk). While attribution of specific weather events to climate change is highly challenging, attributing disasters (the resulting impact) to a specific driver—climate, development or environmental change—is even more difficult, given the complexity of these interactions (Figure B).

Weather-related disasters affect both developed and developing countries, with particularly high disaster impacts in rapidly growing middle-income countries, due to growing asset values in at-risk areas. The largest coastal cities, for example, could experience combined losses of US\$1 trillion by mid-century (Hallegatte et al. 2013).

Figure B: The role of natural hazards, exposure and vulnerability in disaster risk



Disaster risk is determined by the occurrence of a natural hazard (e.g., a cyclone), which may impact exposed populations and assets (e.g., houses located in the cyclone path). Vulnerability is the characteristic of the population or asset making it particularly susceptible to damaging effects (e.g., fragility of housing construction). Poorly planned development, poverty, environmental degradation and climate change are all drivers that can increase the magnitude of this interaction, leading to larger disasters.

Source: Adapted from IPCC, 2012.

However, low-income and lower middle-income countries have the least capacity to cope and, in general, suffer the highest human toll, accounting for 85% of all disaster fatalities (Munich Re 2010).

Building climate resilience is essential to the global goals of ending extreme poverty and promoting shared prosperity

While many uncertainties persist, one thing is clear: climate-related impacts will continue to grow due to both development and climate drivers (IPCC 2013), and impacts will be felt most acutely by the poor. Unless measures are taken to reduce risks, climate change is likely to undermine poverty goals and exacerbate inequality for decades to come.

Climate change will have the greatest impact on the poorest and most marginalized populations, who commonly live in the highest-risk areas (for example, 72% of the African urban population live in informal settlements). They are also the ones with the least ability to recover from recurrent, low-intensity events, which can have crippling and cumulative effects on livelihoods. The impacts of climate change on poverty are expected to be regressive and differential, affecting most significantly the urban poor (net food consumers) and highly vulnerable countries in sub-Saharan Africa and South Asia, where the number of exposed poor may reach 325 million by 2030 (Shepherd et al. 2013). Many of these countries are also those with the least capacity to prepare for, and absorb, the effects of climate events.

Climate change is already exacerbating inequality; at the subnational level, impacts tend to be most severe in already impoverished areas. As climate effects can undermine hard-earned development gains, potentially trapping the most vulnerable into poverty, their impacts need to be minimized by reducing the magnitude of the hazard (which requires a global solution, namely reducing greenhouse gas emissions), diminishing exposure (by protecting and/or assisting the poor to live in safer areas) or decreasing the vulnerability of the poor to climate shocks. Social protection programs are an important part of such a strategy, but must be complemented by policies that directly help the poor become more resilient.

The common goal should be climate and disaster resilient development, while recognizing that it comes at a cost

Risk reduction and better preparedness to deal with climate and disaster impacts can substantially decrease the cost of disasters. From India to Bangladesh to Madagascar, early warning systems, better preparedness and improved safety codes have proven to be cost effective, save human lives, and protect public and private investments. Climate and disaster resilient development, therefore, makes sense both from a poverty alleviation, as well as from an economic, perspective.

Yet despite its cost effectiveness over the long term, climate and disaster resilient development can require substantial start-up costs. Safer structures require design changes that typically cost 10 to 50% more to build—and even more if transport or water networks need to be relocated (GFDRR 2010). In addition, improved hydro-meteorological systems require new technology and training, risk assessments may require geospatial, scientific and engineering information often at high resolution, and even after risk reduction plans have been implemented, disasters can cause residual costs, making it imperative to reinforce coping strategies.

This report maintains that both developed and developing countries have a common interest in promoting climate and disaster resilient development. While interventions are needed that already make sense under sustainable development, they are now more urgent than ever due to climate change. As such, climate and disaster resilience should form an integral part of national strategies and development assistance, particularly in the most vulnerable and least developed countries.

Given the close interactions between climate change and local drivers of vulnerability, it is important to ultimately strengthen all aspects of climate and disaster resilient development, including coordinating institutions, risk identification and reduction, preparedness, financial and social protection, and resilient reconstruction. Addressing only selected aspects of this framework risks leaving others exposed, and even creating perverse incentives, such as what happens when funding is allocated primarily to disaster response, leaving proactive risk management underfunded.

Much is already known regarding how to build resilience to weather-related disasters, but better integration between climate resilience approaches and disaster risk management is required

Although the approaches used for climate resilience and disaster risk management originated from different disciplines, the two communities of practice are increasingly converging. Much of this convergence is happening on the ground; yet institutional resistance towards integration at national and international levels continues. To prevent fragmentation of scarce local capacity and global resources, the two disciplines must be progressively harmonized into a common agenda.

The World Bank and many other development partners have accumulated a wealth of global expertise in climate and disaster resilient development. Good practices are emerging in both processes, such as institutional frameworks and iterative feedback, as well as instruments and tools, including climate and disaster risk assessment, risk reduction, strengthened preparedness, social and financial protection, and resilient reconstruction. Many of these are described through case studies in this report.

In order to deal with climate and development uncertainties, national stakeholders need sustained and flexible programs, which require clear institutional frameworks and predictable, long-term financing (over at least a decade). The fact that climate affects most sectors introduces an added complexity in many countries where governance systems are structured along sectoral lines. Emerging experience suggests that to be effective, institutional coordination across various ministries should be set at the highest possible level.

In climate and disaster resilient development, the process of strengthening risk management—through better information, timely financing, contingency funds, and enabling policies and planning—can sometimes be more important than the actual achievement of discrete activities (such as building a protection dyke). Often, the activities—and in some cases the actual disaster—serve as a forum to catalyze better climate and disaster resilience decisions. The presence of uncertainties also requires a robust feedback system to determine which approaches succeed, which ones fail and why. The paucity of short-term results, together with slow initial disbursements, may at first deter some donors accustomed to more conventional and risk averse investments; however, it is important that they recognize that this is how climate and disaster resilient development works. An increasing number of countries, such as Colombia, the Philippines, India, Mexico and Samoa, have piloted climate and disaster resilient planning, and evidence shows this has helped them curb climate-related impacts. These countries' experiences are documented in case studies in this report.

Despite progress made, many challenges remain. Long-term projections of climate and development scenarios continue to be highly uncertain, which is often cited as a cause for policy inaction. A robust, iterative decision-making framework is a potential course of action, but data for informed decision making continue to be limited, as are opportunities for engagement with countries at key development planning stages (for example, when national development plans are being prepared). The most important challenges, however, continue to be institutional. The international community should lead by example by further promoting approaches that progressively link climate and disaster resilience to broader development paths, and funding them appropriately.



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