



UNBREAKABLE

» Mapping priorities for disaster risk reduction
and resilience building

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This book contains results and data from *Unbreakable: Building the Resilience of the Poor in the Face of Natural Disasters* (doi: 10.1596/978-1-4648-1003-9). A PDF of the final, full-length book is available at <https://openknowledge.worldbank.org/> and print copies can be ordered at <http://Amazon.com>.

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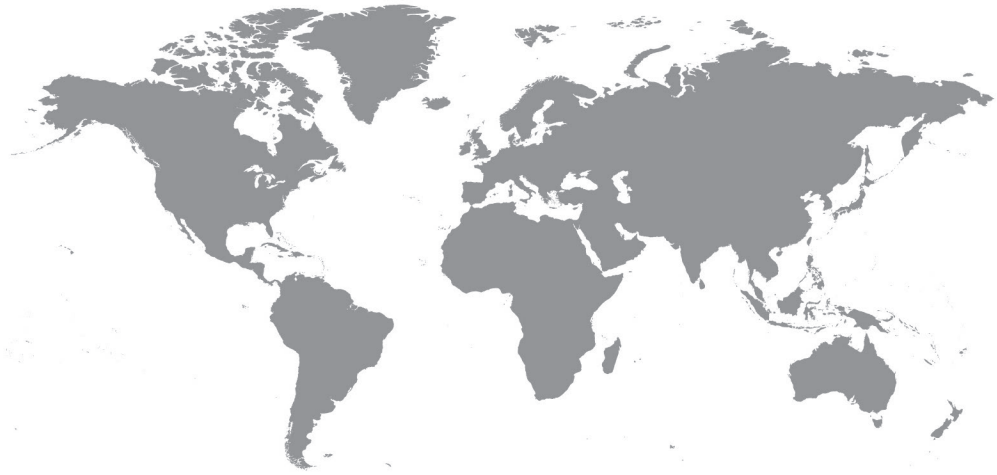
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INTRODUCTION



Mapping priorities for disaster risk reduction and resilience building

‘**E**conomic losses from natural disasters totaled \$92 billion in 2015, and average annual losses have been estimated at more than \$300 billion per year.’ Policy makers, economists, and others are used to such statements, which imply that the costs of natural disasters are limited to the replacement costs of affected buildings, infrastructure, equipment, and agriculture.

Although these figures are useful, they do not reflect the true cost of disasters, insofar as they fail to detail the impact of disasters on people’s well-being. Obviously, \$1 in losses does not mean the same thing to a rich person as to a poor person, so the severity of a \$92 billion loss depends on who experiences it. Conversely, relatively minor floods or earthquakes may have negligible impacts on a country’s aggregate wealth or production while still devastating poor communities with very low incomes and assets.

The same loss affects poor and marginalized people far more than wealthier people because their livelihoods depend on fewer assets, and their consumption is closer to subsistence levels. They cannot rely on savings to smooth the impacts of losses, placing their health and education at greater risk and potentially requiring more time to recover and reconstruct. By focusing on aggregate losses, the traditional approach examines how disasters affect people wealthy enough to have wealth to lose and so does not take into account most poor people.

This shortcoming is not just a monitoring issue. When projects to reduce disaster risk are assessed on the basis of the value of damages avoided, analyses favor projects that will protect or support richer areas and people. Imagine two flood protection projects with similar costs. The first would cover a wealthy neighborhood in a capital city.

Because of the density of high-value assets, it would avert on average \$10 million a year in damages. The second project would target poorer areas in a second-tier city and prevent just \$5 million a year in losses. A traditional analysis would unambiguously select the first project. But a \$5 million loss may matter more to poor people than a \$10 million loss to richer people. If the second project benefits very poor people, it may generate greater benefits for well-being. And because well-being is the ultimate goal of public policy, the second project may be more attractive.

Moreover, not all risk management policies can be assessed using metrics that include only asset and production losses. Policies such as increasing access to financial services and expanding social safety nets make it easier for people to absorb, cope with, and recover from damages caused by natural disasters. Thus such policies can mitigate the impacts of natural disasters even though they have no impact on direct damages for disasters.

The Unbreakable report moves beyond asset and production losses, focusing instead on how natural disasters affect people's well-being. This represents an improvement over the traditional metrics, as well-being captures more fully the effects of natural disaster risk and losses on poor and nonpoor people, even when the economic losses of poor people are small in absolute terms. The assessment framework outlined in Unbreakable can be used to design coherent, effective disaster risk management policies and projects, and to ensure that allocations of investments and other resources improve the well-being of all people and are not systematically driven toward wealthier areas and individuals.

In this report, the well-being metric is used to assess the benefits of 11 different disaster risk management policies in 117 countries. The policies can be grouped into two pillars: traditional approaches that reduce risks to avoid disasters, and resilience-building approaches, which improve the ability of populations to manage disasters that cannot be avoided. In all of the 117 countries studied, well-being losses from natural disasters are larger than asset losses. Globally, poor people are disproportionately affected by these losses: the poorest 20% experience only 11% of total asset losses, but 47% of well-being losses annually. Thus, poor people experience asset losses that are only half of the average, but well-being losses that are more than twice as large.

Here, we list the countries that can benefit most from each of the 11 disaster risk management policies considered. In absolute terms, the largest and highest-risk countries could achieve the largest gains by implementing almost any of the policies. Relative to their GDPs, however, the benefits of effective disaster risk management policies can be even greater in smaller countries, achieving well-being benefits that far outweigh their costs.

AVOIDING DISASTERS



**Well-being losses can be mitigated
by reducing asset losses**

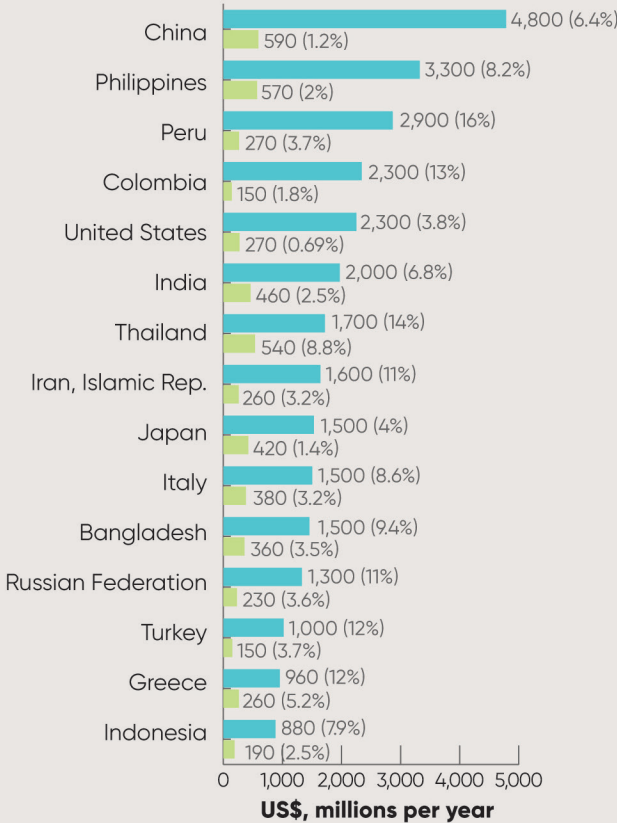
REDUCE EXPOSURE OF THE POOR BY 5% OF TOTAL EXPOSURE

TOP 15 COUNTRIES:

■ Avoided well-being losses
■ Avoided asset losses

ABSOLUTE TERMS

US\$ million per year (% of current losses)



RELATIVE TERMS

% of current losses (US\$ million per year)

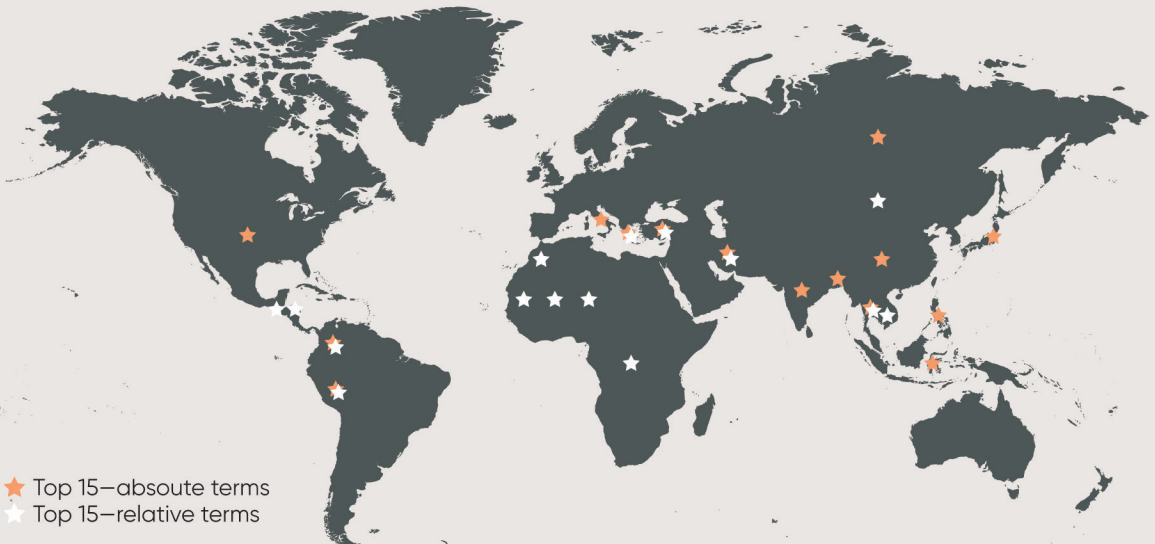
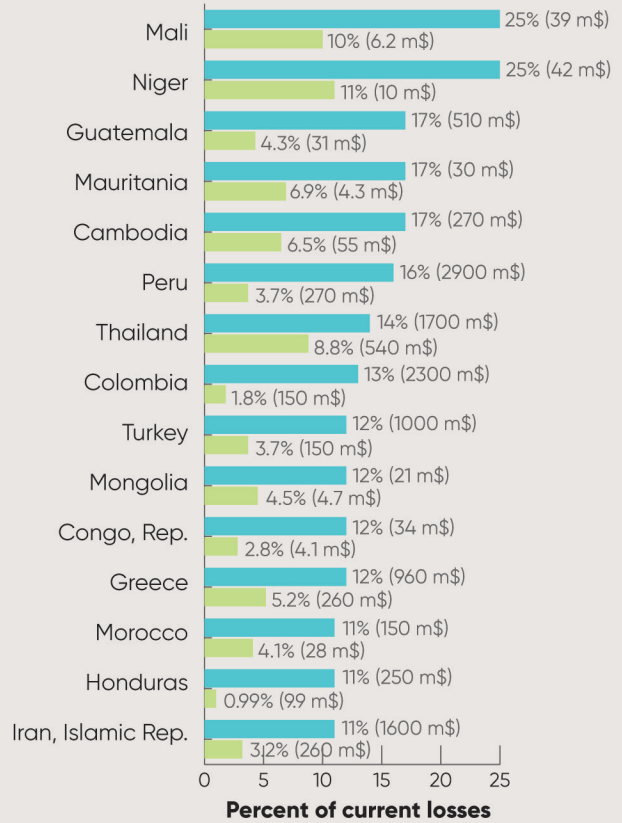


Figure shows the avoided asset losses and avoided well-being losses from a 5 percent reduction in exposure, achieved by reducing the exposure of poor people only—in absolute terms in panel a (millions of U.S. dollars per year, purchasing power parity-adjusted) and in relative terms in panel b (percentage of current average asset and well-being losses). The map shows the 15 countries where this policy reduces well-being losses the most in absolute and relative terms (in orange and white, respectively).

REDUCE EXPOSURE OF THE NONPOOR BY 5% OF TOTAL EXPOSURE

TOP 15 COUNTRIES:

■ Avoided well-being losses
■ Avoided asset losses

ABSOLUTE TERMS

US\$ million per year (% of current losses)



RELATIVE TERMS

% of current losses (US\$ million per year)

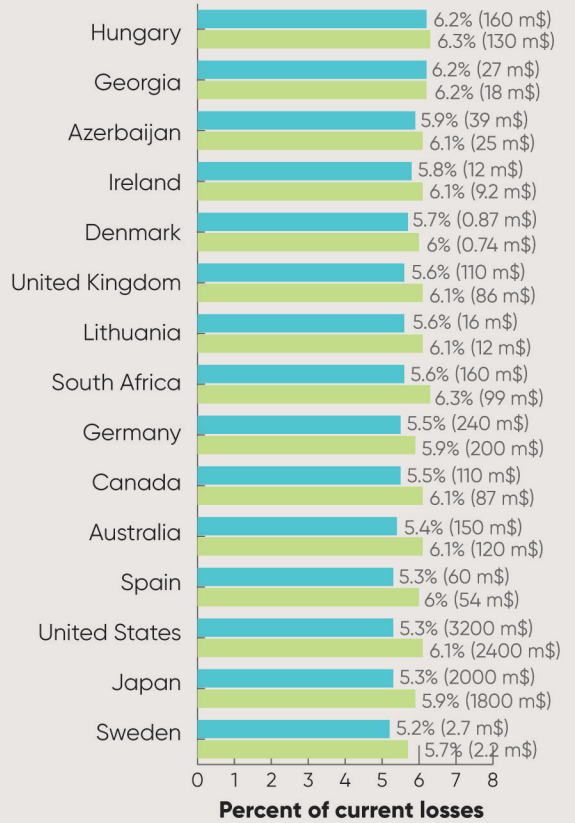


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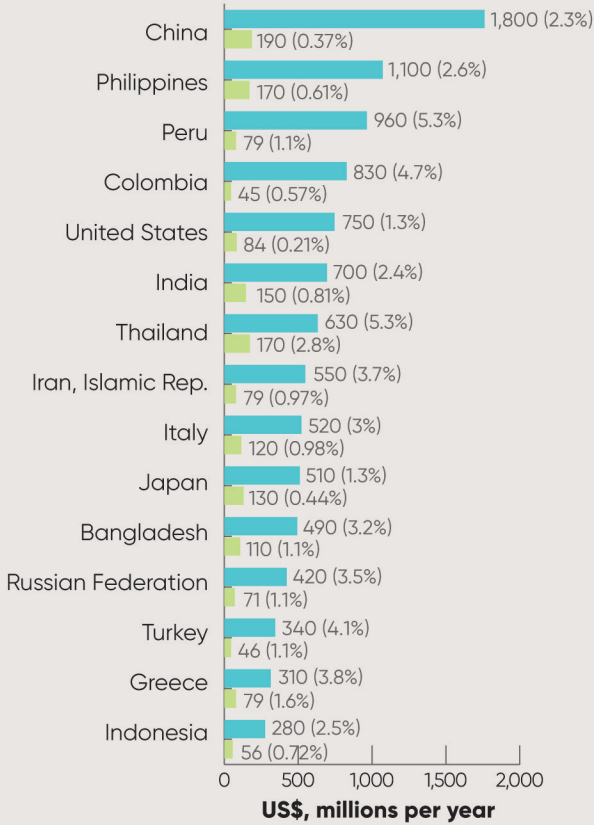
REDUCE ASSET VULNERABILITY (BY 30%) OF POOR PEOPLE (5% OF TOTAL POPULATION)

TOP 15 COUNTRIES:

■ Avoided well-being losses
■ Avoided asset losses

ABSOLUTE TERMS

US\$ million per year (% of current losses)



RELATIVE TERMS

% of current losses (US\$ million per year)

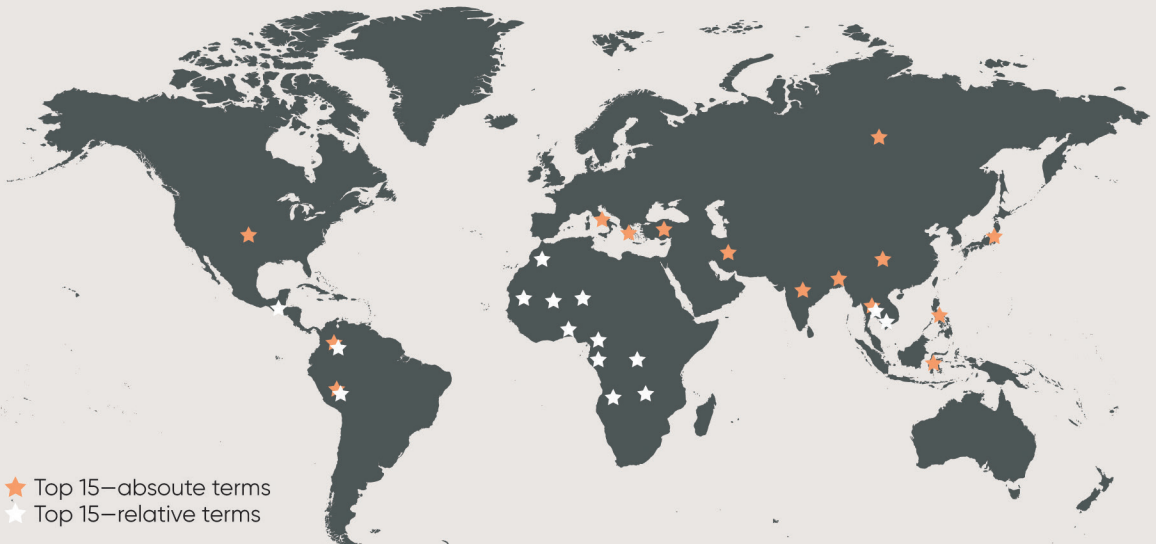
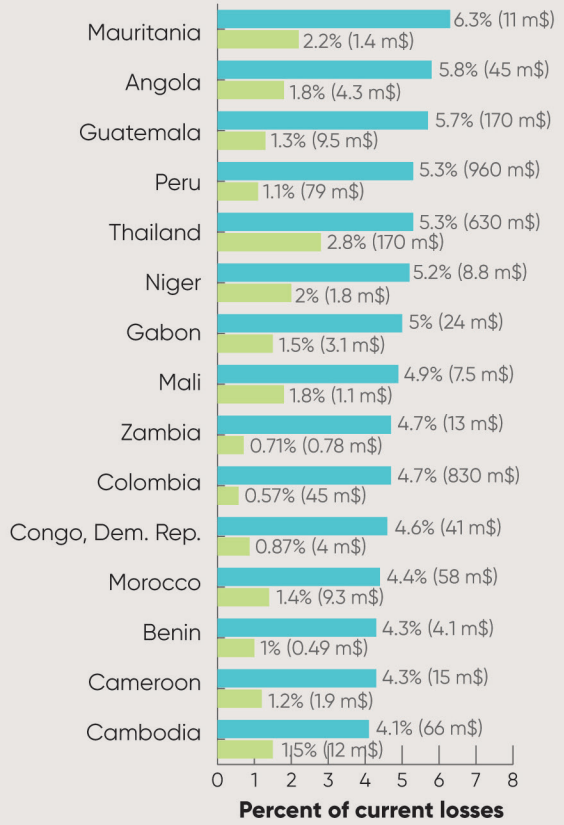


Figure shows the avoided asset losses and gains in well-being from a 30 percent reduction in the asset vulnerability of 5 percent of the population, taken among poor people—in absolute terms in panel a (millions of U.S. dollars per year, purchasing power parity-adjusted) and in relative terms in panel b (percentage of current average asset and well-being losses). The map shows the 15 countries where this policy reduces well-being losses the most in absolute and relative terms (in orange and white, respectively).

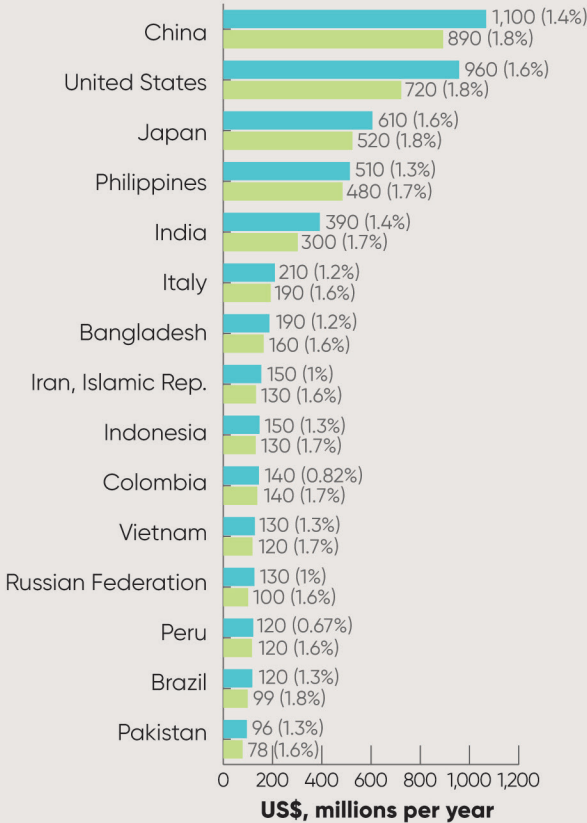
REDUCE ASSET VULNERABILITY (BY 30%) OF NONPOOR PEOPLE (5% OF TOTAL POPULATION)

TOP 15 COUNTRIES:

■ Avoided well-being losses
■ Avoided asset losses

ABSOLUTE TERMS

US\$ million per year (% of current losses)



RELATIVE TERMS

% of current losses (US\$ million per year)

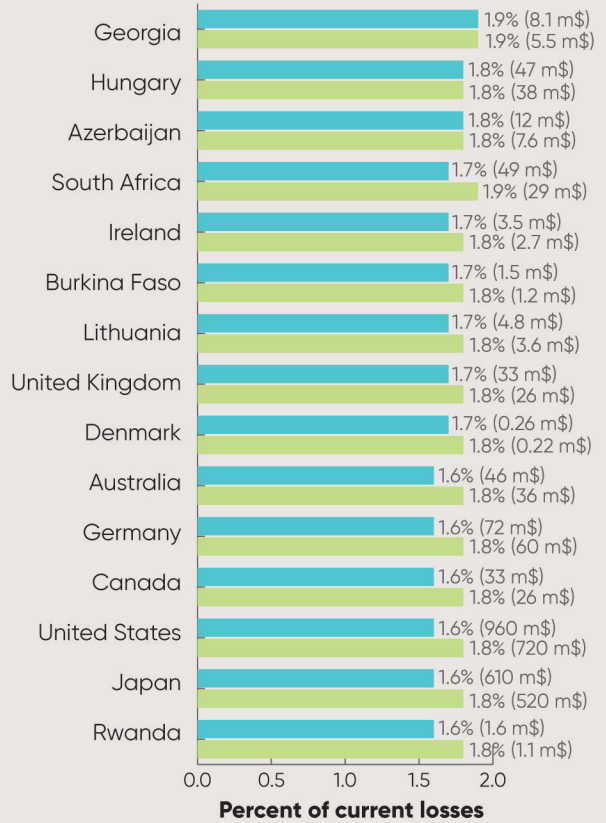


Figure shows the avoided asset losses and gains in well-being from a 30 percent reduction in the asset vulnerability of 5 percent of the population, taken among nonpoor people—in absolute terms in panel a (millions of U.S. dollars per year, purchasing power parity-adjusted) and in relative terms in panel b (percentage of current average asset and well-being losses). The map shows the 15 countries where this policy reduces well-being losses the most in absolute and relative terms (in orange and white, respectively).

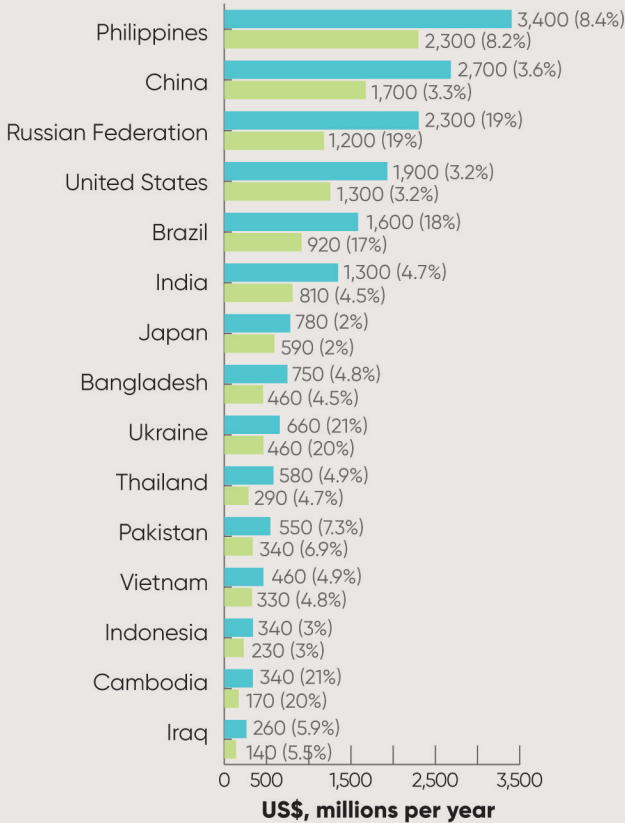
UNIVERSAL ACCESS TO EARLY WARNINGS

TOP 15 COUNTRIES:

■ Avoided well-being losses
■ Avoided asset losses

ABSOLUTE TERMS

US\$ million per year (% of current losses)



RELATIVE TERMS

% of current losses (US\$ million per year)

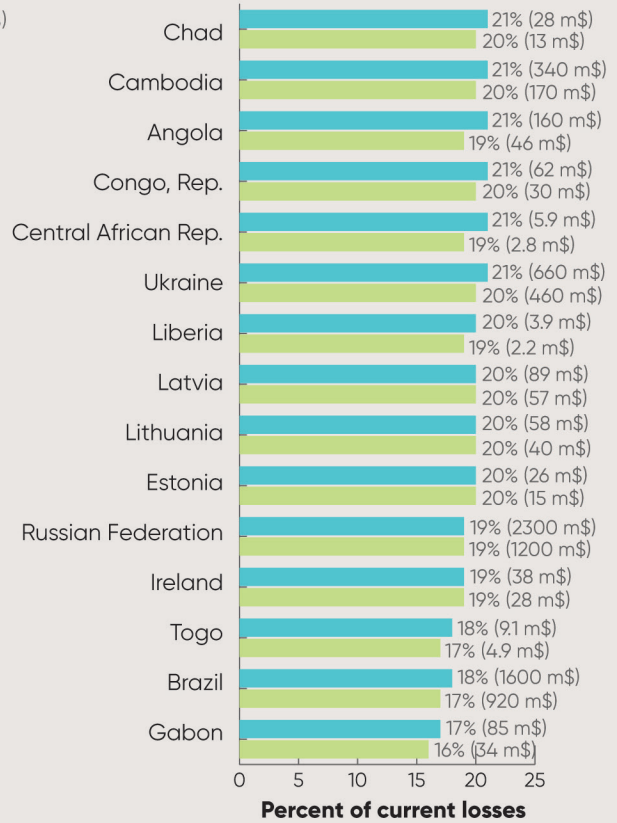


Figure shows the avoided asset losses and gains in well-being from assuming universal access to early warning systems—in absolute terms in panel a (millions of U.S. dollars per year, purchasing power parity-adjusted) and in relative terms in panel b (percentage of current average asset and well-being losses). The map shows the 15 countries where this policy reduces well-being losses the most in absolute and relative terms (in orange and white, respectively).

MANAGING THE UNAVOIDABLE



Risk can be reduced by improving resilience

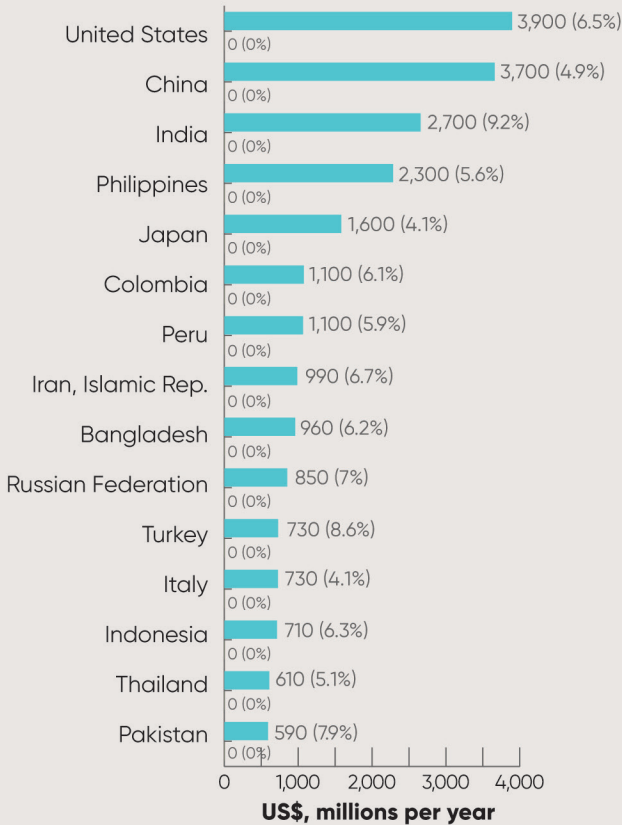
ACCELERATE RECONSTRUCTION (BY 33%)

TOP 15 COUNTRIES:

■ Avoided well-being losses
■ Avoided asset losses

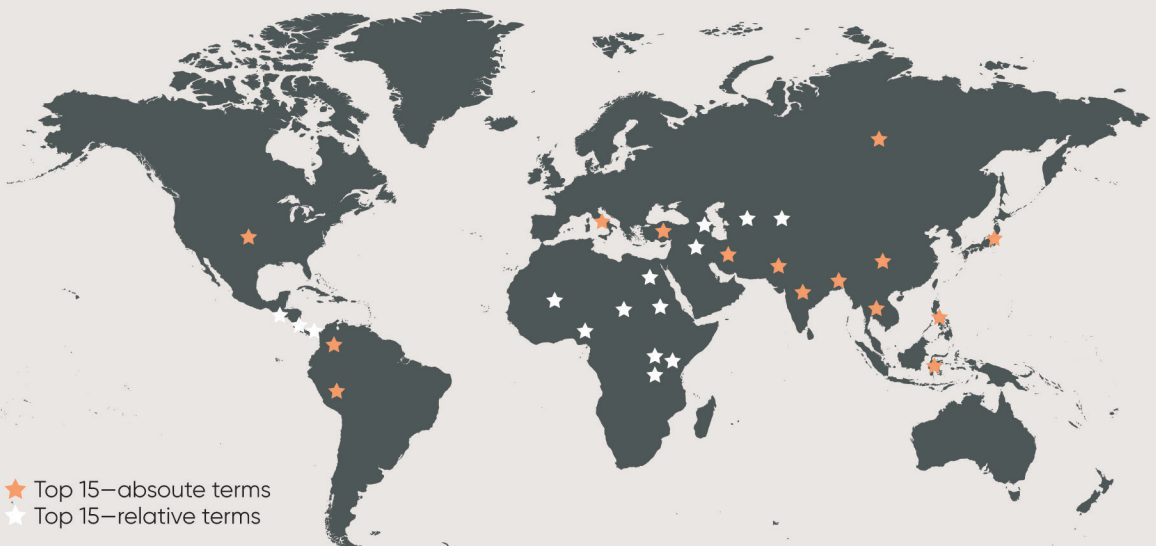
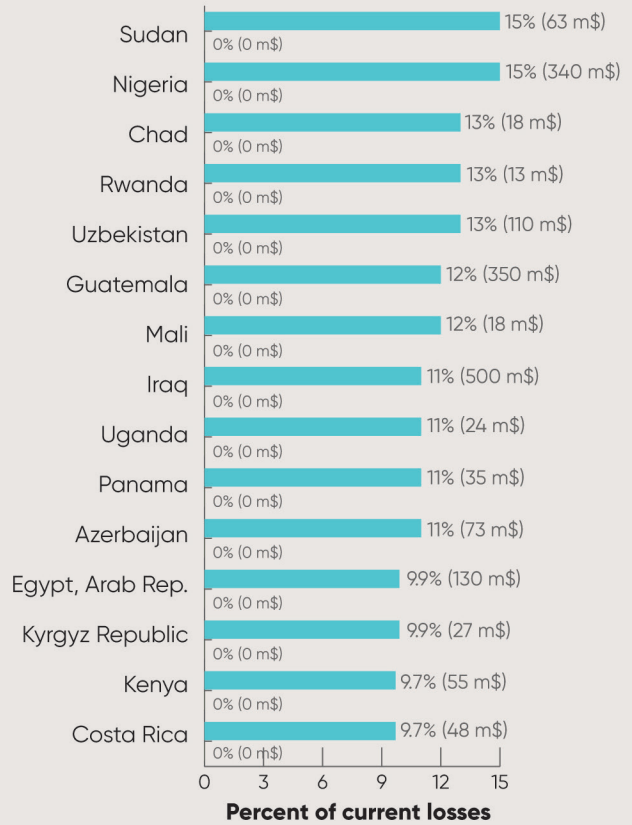
ABSOLUTE TERMS

US\$ million per year (% of current losses)



RELATIVE TERMS

% of current losses (US\$ million per year)



★ Top 15—absolute terms
★ Top 15—relative terms

Figure shows the avoided asset losses and gains in well-being from reducing the reconstruction duration by one-third—in absolute terms in panel a (millions of U.S. dollars per year, purchasing power parity-adjusted) and in relative terms in panel b (percentage of current average asset and well-being losses). The map shows the 15 countries where this policy reduces well-being losses the most in absolute and relative terms (in orange and white, respectively).

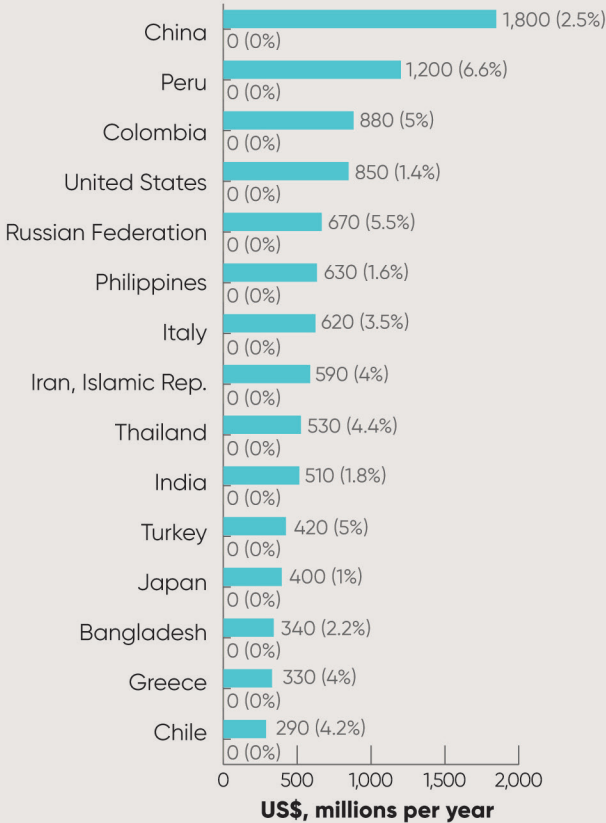
UNIVERSAL ACCESS TO FINANCE

TOP 15 COUNTRIES:

■ Avoided well-being losses
■ Avoided asset losses

ABSOLUTE TERMS

US\$ million per year (% of current losses)



RELATIVE TERMS

% of current losses (US\$ million per year)

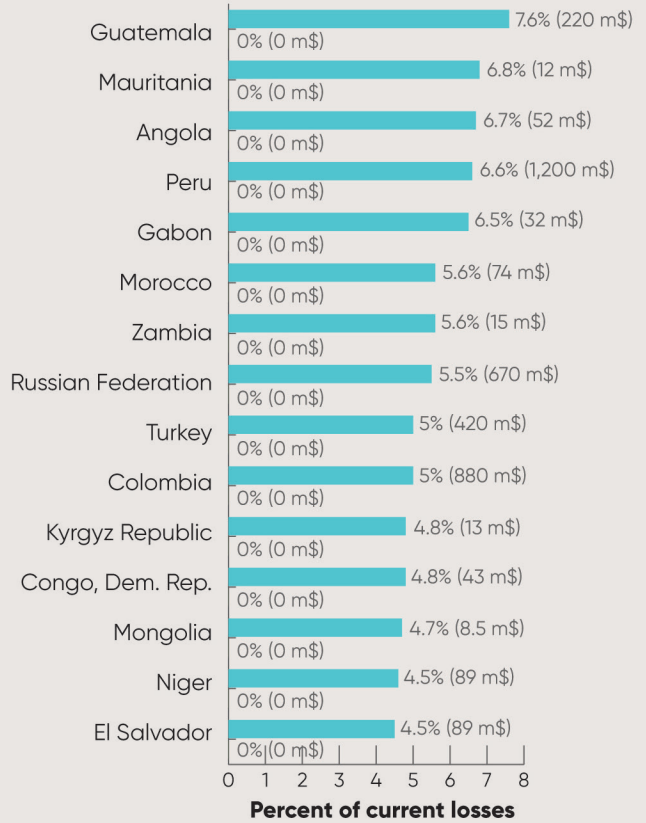


Figure shows the avoided asset losses and gains in well-being from assuming that 100 percent of population has savings at a financial institution—in absolute terms in panel a (millions of U.S. dollars per year, purchasing power parity-adjusted) and in relative terms in panel b (percentage of current average asset and well-being losses). The map shows the 15 countries where this policy reduces well-being losses the most in absolute and relative terms (in orange and white, respectively).

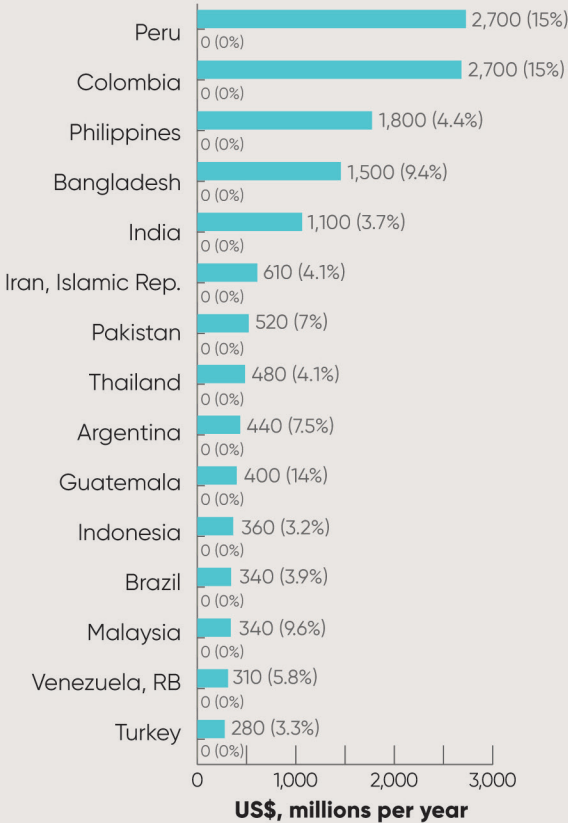
INCREASE SOCIAL TRANSFERS TO POOR PEOPLE TO AT LEAST 33%

TOP 15 COUNTRIES:

■ Avoided well-being losses
■ Avoided asset losses

ABSOLUTE TERMS

US\$ million per year (% of current losses)



RELATIVE TERMS

% of current losses (US\$ million per year)

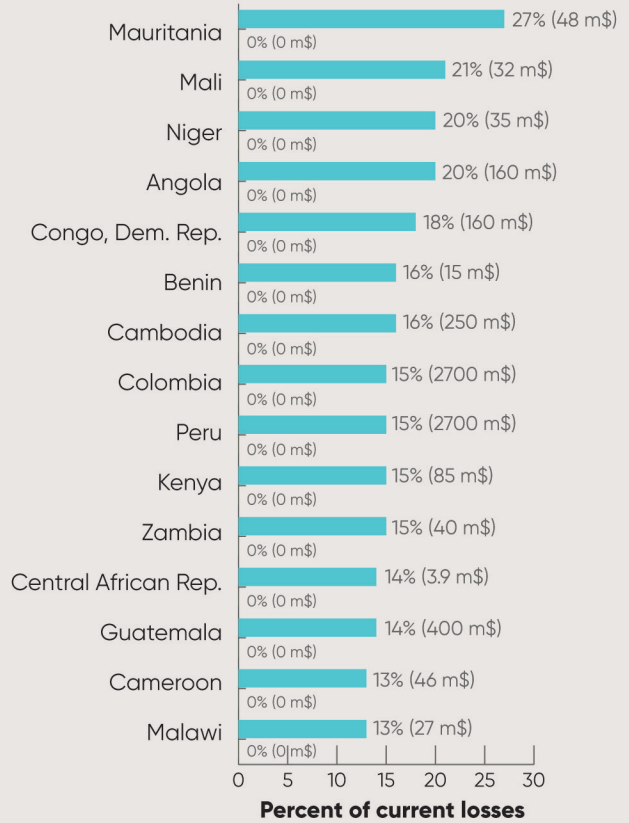


Figure shows the avoided asset losses and gains in well-being from assuming that the bottom 20 percent receives at least 33 percent of their income from social protection—in absolute terms in panel a (millions of U.S. dollars per year, purchasing power parity-adjusted) and in relative terms in panel b (percentage of current average asset and well-being losses). The map shows the 15 countries where this policy reduces well-being losses the most in absolute and relative terms (in orange and white, respectively).

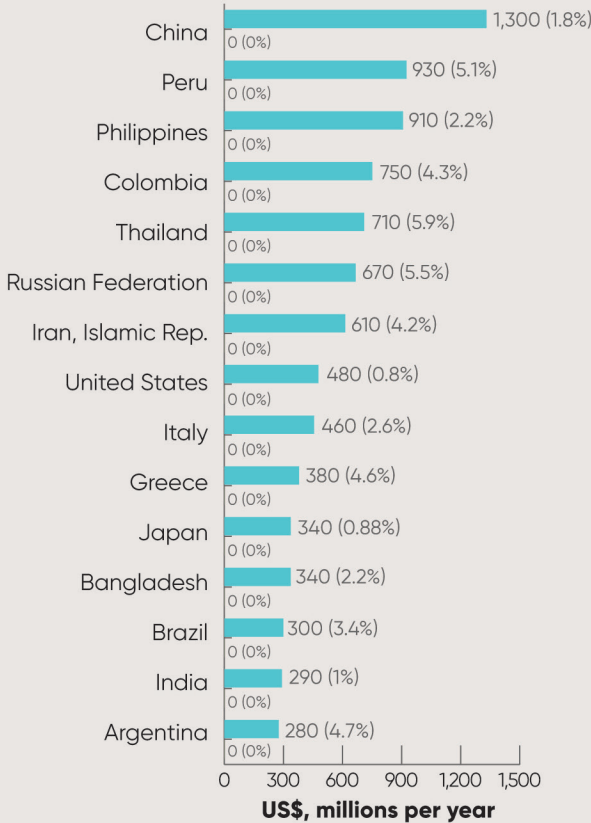
POSTDISASTER SUPPORT PACKAGE

TOP 15 COUNTRIES:

■ Avoided well-being losses
■ Avoided asset losses

ABSOLUTE TERMS

US\$ million per year (% of current losses)



RELATIVE TERMS

% of current losses (US\$ million per year)

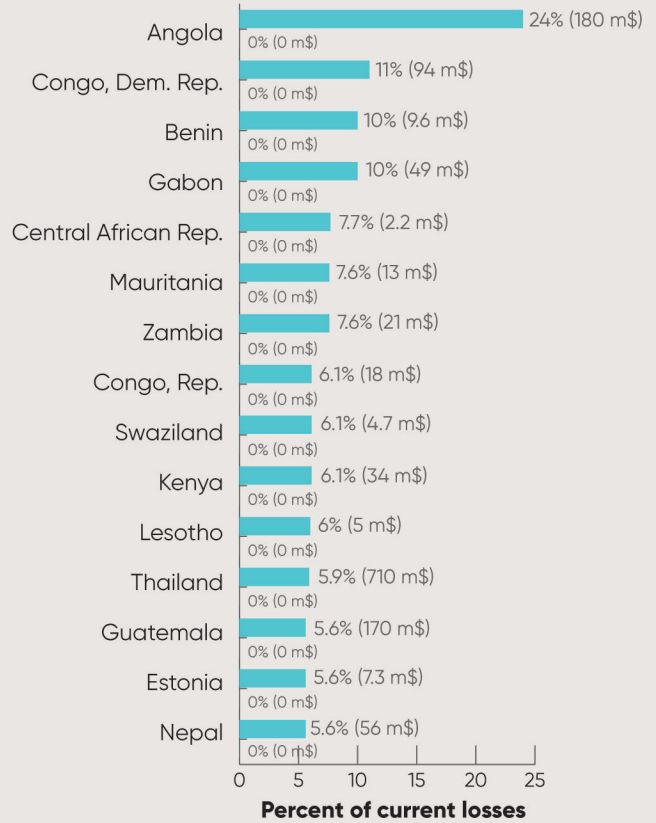


Figure shows the avoided asset losses and gains in well-being from the implementation of a package that includes financial instruments to ensure that the government has access to resources after a disaster and a delivery mechanism to provide support to the affected population. Gains are in absolute terms in the first panel (millions of U.S. dollars per year, purchasing power parity-adjusted) and in relative terms in the second panel (percentage of current average asset and well-being losses). The map shows the 15 countries where this policy reduces well-being losses the most in absolute and relative terms (in orange and white, respectively).

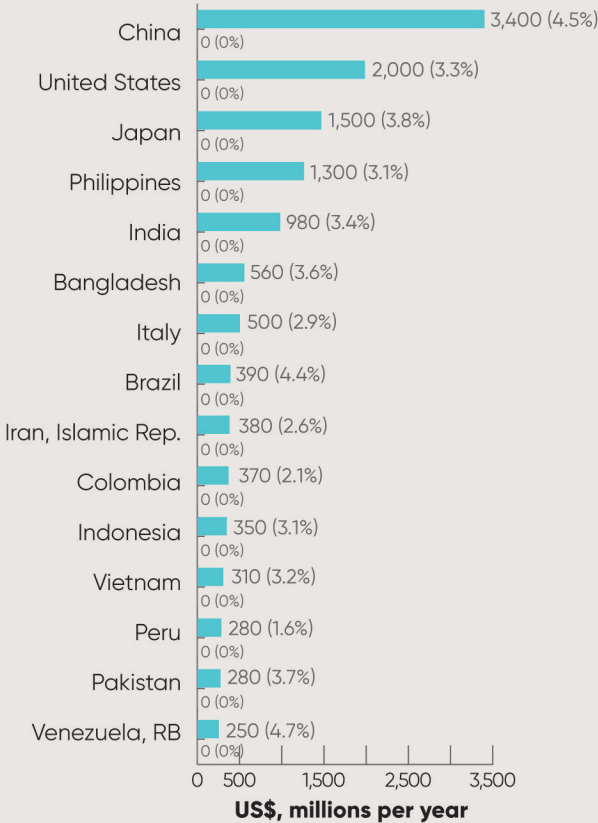
DEVELOP MARKET INSURANCE (NONPOOR PEOPLE)

TOP 15 COUNTRIES:

■ Avoided well-being losses
■ Avoided asset losses

ABSOLUTE TERMS

US\$ million per year (% of current losses)



RELATIVE TERMS

% of current losses (US\$ million per year)

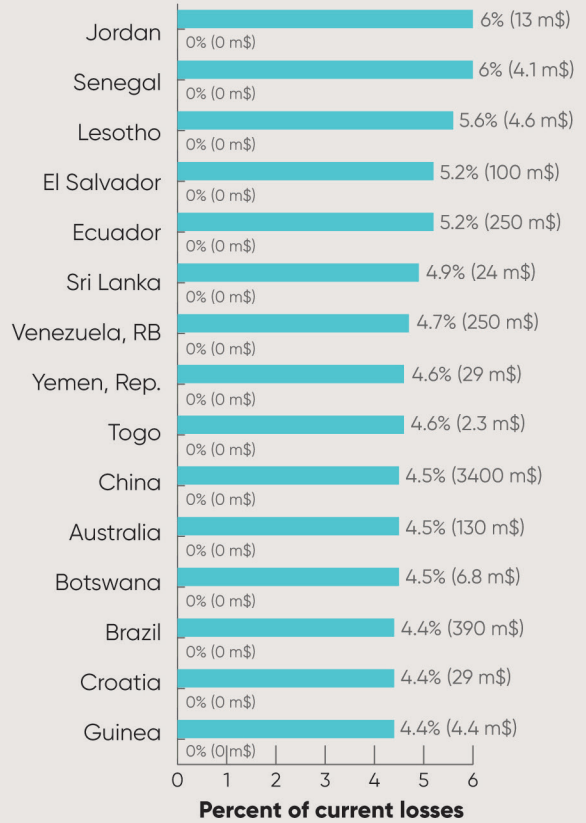


Figure shows the avoided asset losses and gains in well-being from the development of market insurance, assuming that 50 percent of the losses of 25 percent of the nonpoor are shared in each country (without international sharing). Gains are in absolute terms in the first panel (millions of U.S. dollars per year, purchasing power parity-adjusted) and in relative terms in the second panel (percentage of current average asset and well-being losses). The map shows the 15 countries where this policy reduces well-being losses the most in absolute and relative terms (in orange and white, respectively).

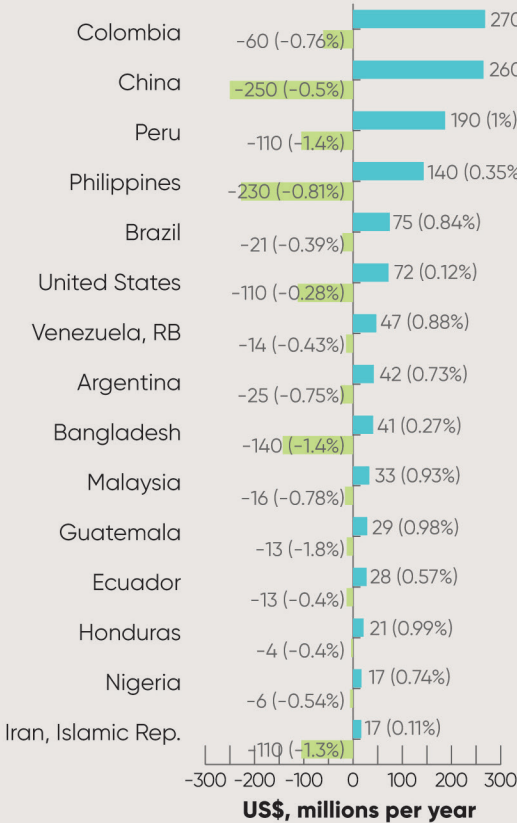
INCREASE INCOME OF THE POOR 10%

TOP 15 COUNTRIES:

■ Avoided well-being losses
■ Avoided asset losses

ABSOLUTE TERMS

US\$ million per year (% of current losses)



RELATIVE TERMS

% of current losses (US\$ million per year)

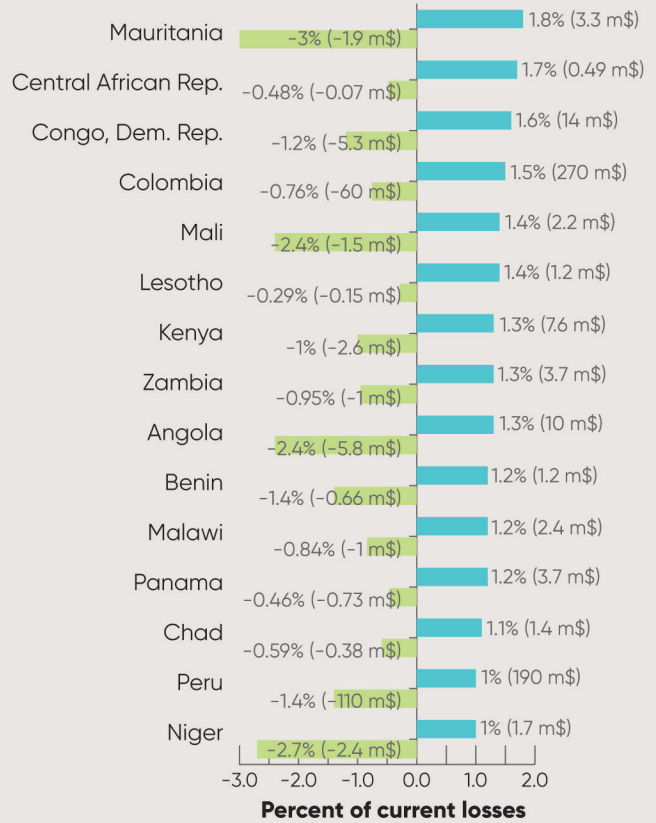
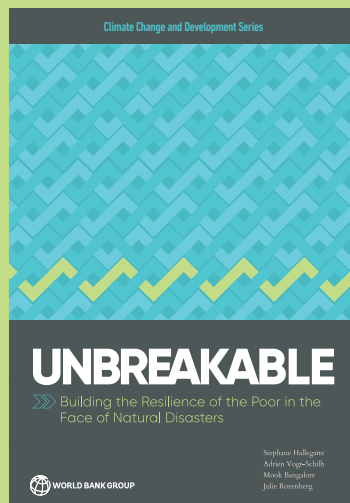
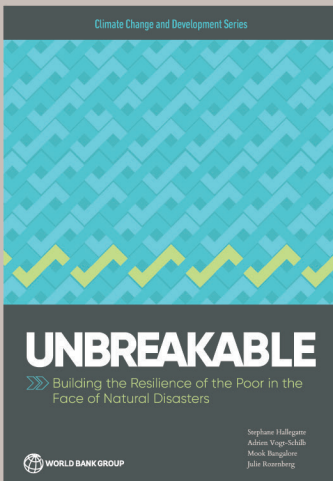
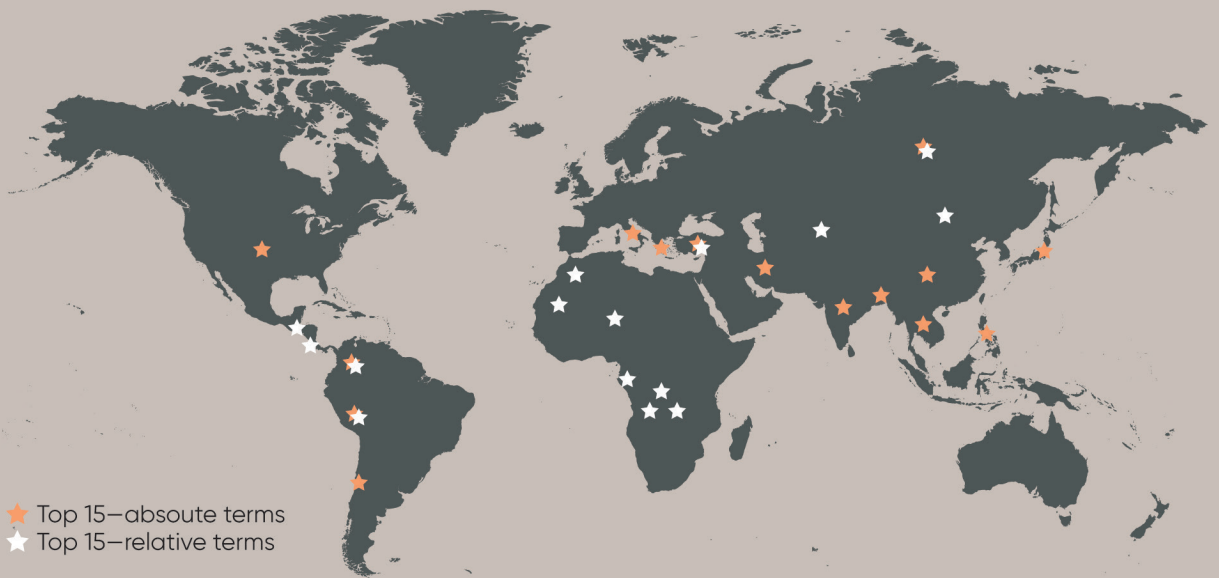


Figure shows the avoided asset losses and gains in well-being from an increase by 10 percent of the income of poor people. Gains are in absolute terms in the first panel (millions of U.S. dollars per year, purchasing power parity-adjusted) and in relative terms in the second panel (percentage of current average asset and well-being losses). The map shows the 15 countries where this policy reduces well-being losses the most in absolute and relative terms (in orange and white, respectively).

UNBREAKABLE

» See the full report, "Unbreakable: Building Resilience of the Poor in the Face of Natural Disasters" at www.gfdr.org/unbreakable





The report *Unbreakable: Building the Resilience of the Poor in the Face of Natural Disasters* investigates many policies that can reduce the well-being losses due to natural disasters, looking at policies to avoid disasters and reduce asset losses—such as land-use planning and protection infrastructure—and at policies that make the population better able to cope with and recover from disasters that cannot be avoided. The report provides estimates of the potential benefits from these policies, on a global scale and in a few selected countries. Here, we provide estimates of the benefits of these policies in the 117 countries that have been analyzed.