

# UNBREAKABLE

»» Building the Resilience of the Poor in the  
Face of Natural Disasters



**GFDRR**

Global Facility for Disaster Reduction and Recovery

Stephane Hallegatte  
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## **Project A**

Costs \$100 million

Prevents on average \$20 million of losses per years



## **Project B**

Costs \$100 million

Prevents on average \$5 million of losses per years





Traditional risk assessment combines hazard, exposure and vulnerability of assets ...

## ASSET LOSSES

1. Hazard

2. Exposure

3. Vulnerability





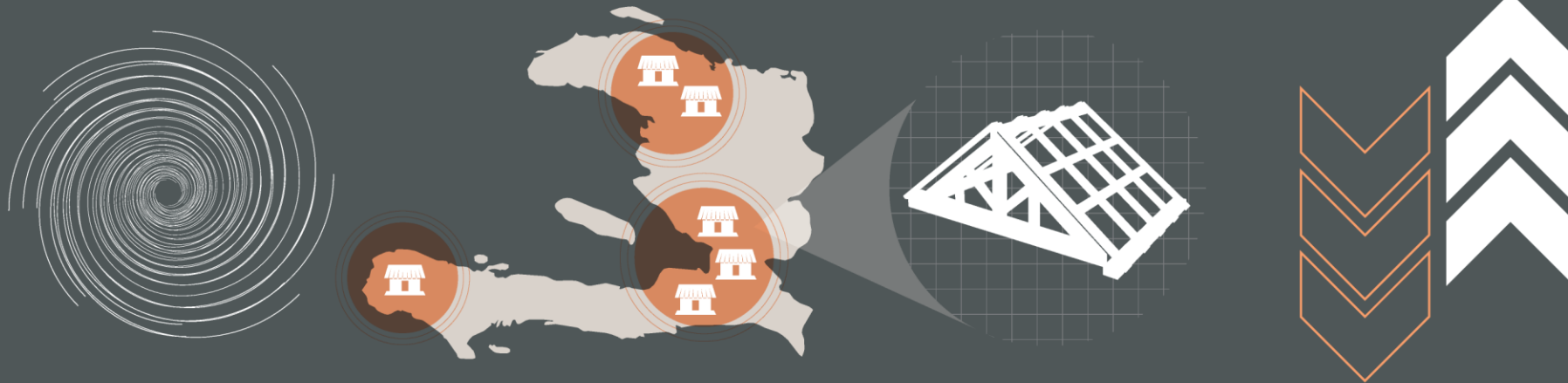
We also account for who is affected, and their **resilience**—that is, the capacity of affected people to cope with and recover from the shock

## ASSET LOSSES

1. Hazard

2. Exposure

3. Vulnerability



## WELL-BEING LOSSES

1. Hazard

2. Exposure

3. Vulnerability

4. **Socioeconomic resilience**

**WE HAVE 3 MAIN MESSAGES.**

## **MAIN MESSAGE #1**

Disaster risk reduction is poverty reduction ...  
... and poverty reduction is disaster risk reduction











**Poverty**

**Disaster losses**









## **MAIN MESSAGE #2**

Natural disasters affect well-being more than traditional estimates suggest.

We model losses in terms of well-being, not only asset—  
accounting for differences between poor and non-poor people.



### **Hazard**

- Flood level
- Wind speed
- Hard and soft protection
- Temperature
- Precipitations



### **Exposure**

- Location of people and assets
- Occupation



### **Asset losses**

- Housing and infrastructure quality
- Livestock and other assets
- Early-warning systems



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### **Income losses**

- Diversification of income
- Link between assets and income
- How long will the shock last?

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### **Consumption losses**

- Social protection
- Savings and borrowing
- Insurance and remittances

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### Consumption losses

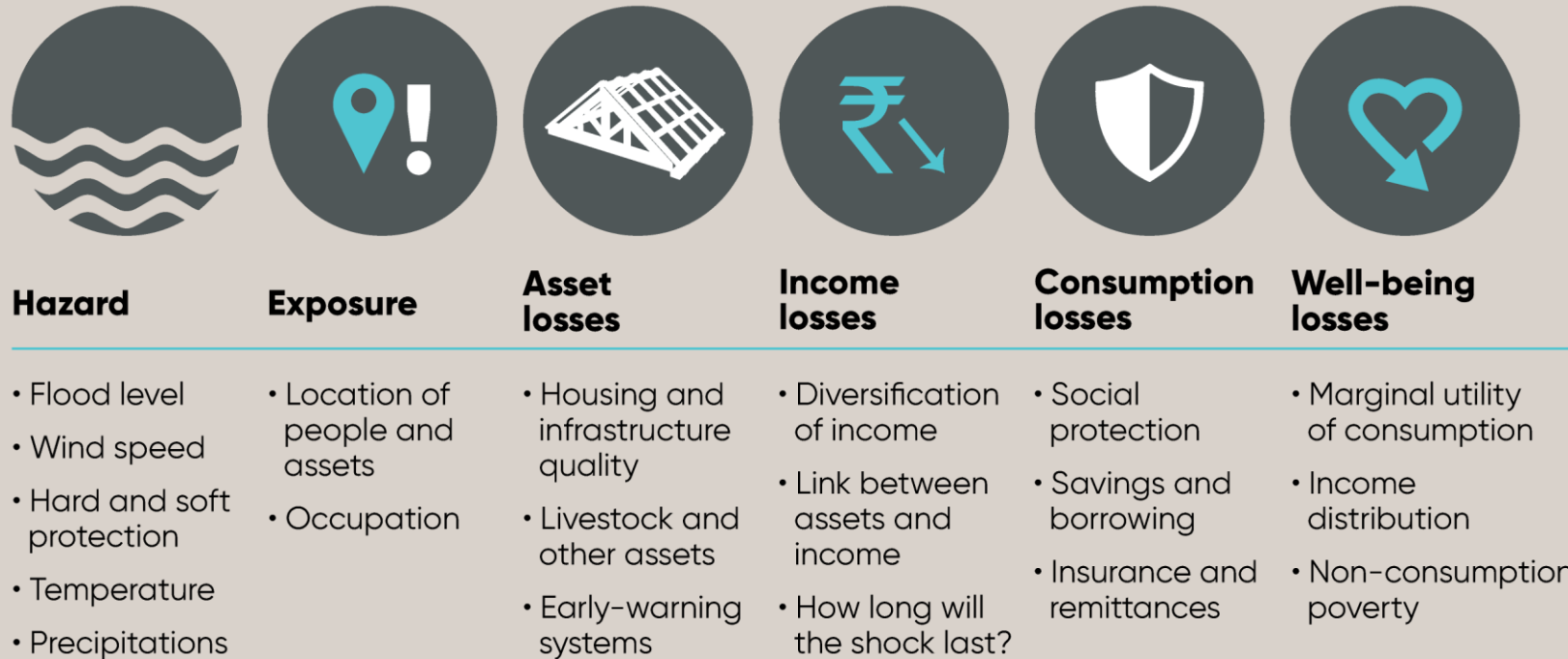
- Social protection
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### Well-being losses

- Marginal utility of consumption
- Income distribution
- Non-consumption poverty

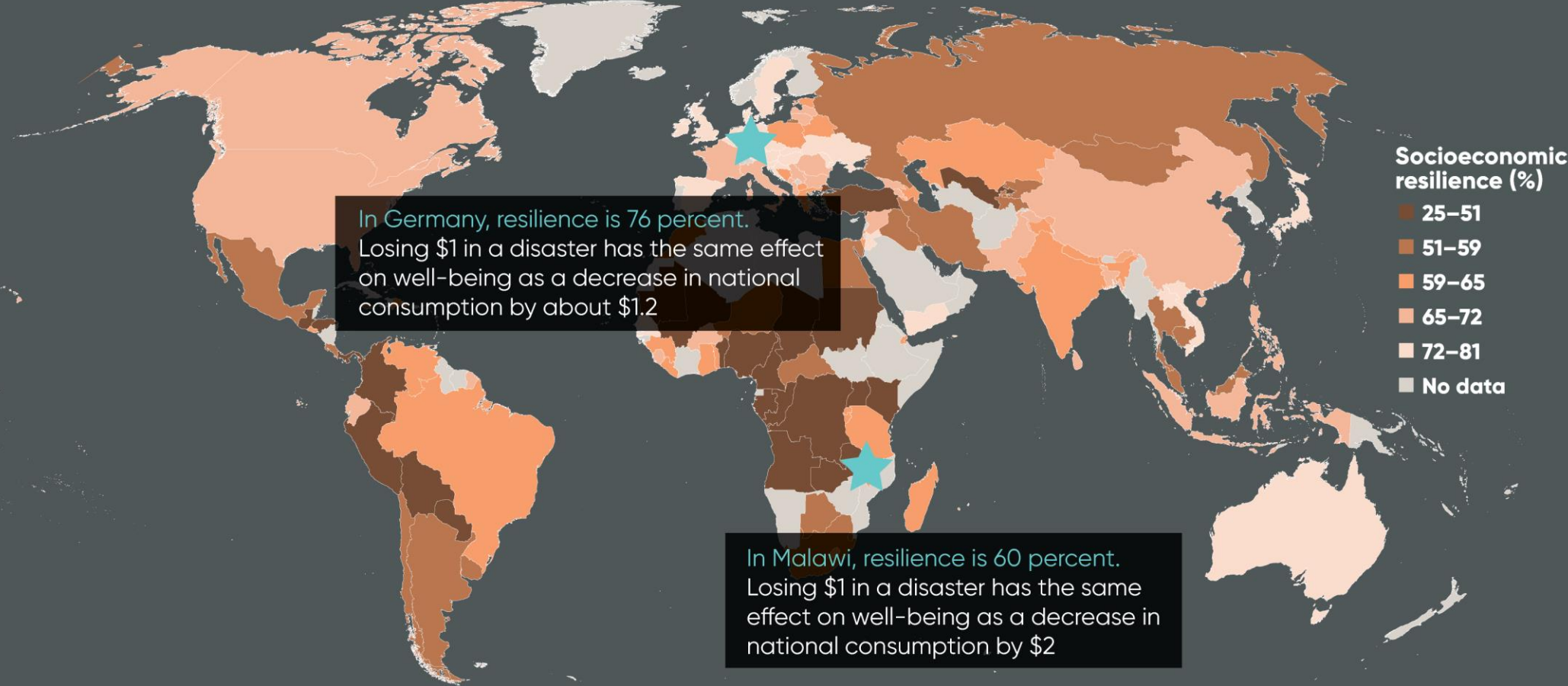
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$$\text{socioeconomic resilience} = \frac{\text{asset losses}}{\text{well-being losses}}$$



# Socioeconomic resilience (percent)—117 countries



Asset losses are estimated at \$300 billion per year. (UN, 2015)



Well-being losses average \$500 billion per year



But socioeconomic resilience is below 100 percent everywhere.

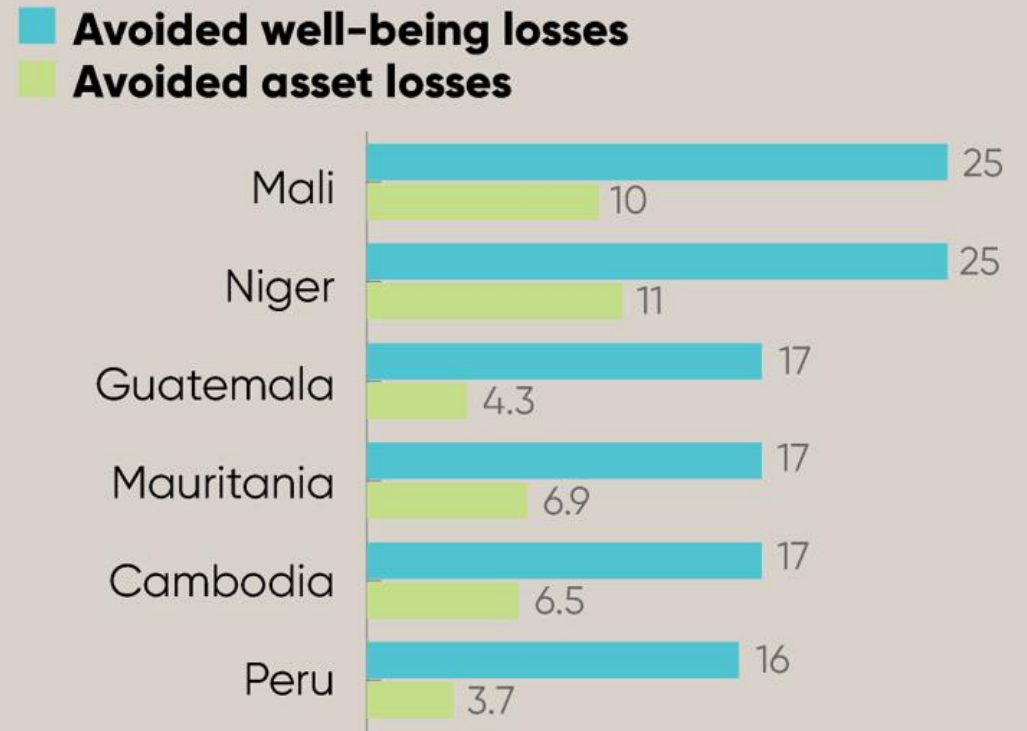


# These estimates can also be used to target intervention in high-priority countries

**Benefits from reducing the exposure of poor people, by 5 percent of total exposure.** →

In countries with low resilience, the benefits from lower exposure are magnified.

Where risks are very concentrated, interventions are more efficient.



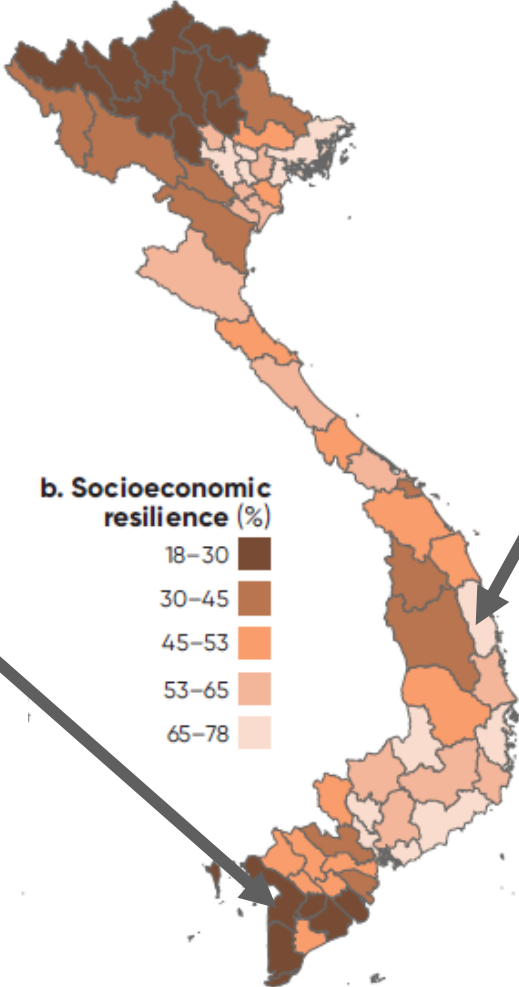
# These estimates can also be used to target intervention within countries

Prevents \$1 million per year in asset losses



In Kien Giang  
(resilience 29%)

Gains in terms of well-being  
\$3.4 million



Prevents \$1 million per year in asset losses



In Binh Dinh  
(resilience 69%)

Gains in terms of well-being  
\$1.4 million



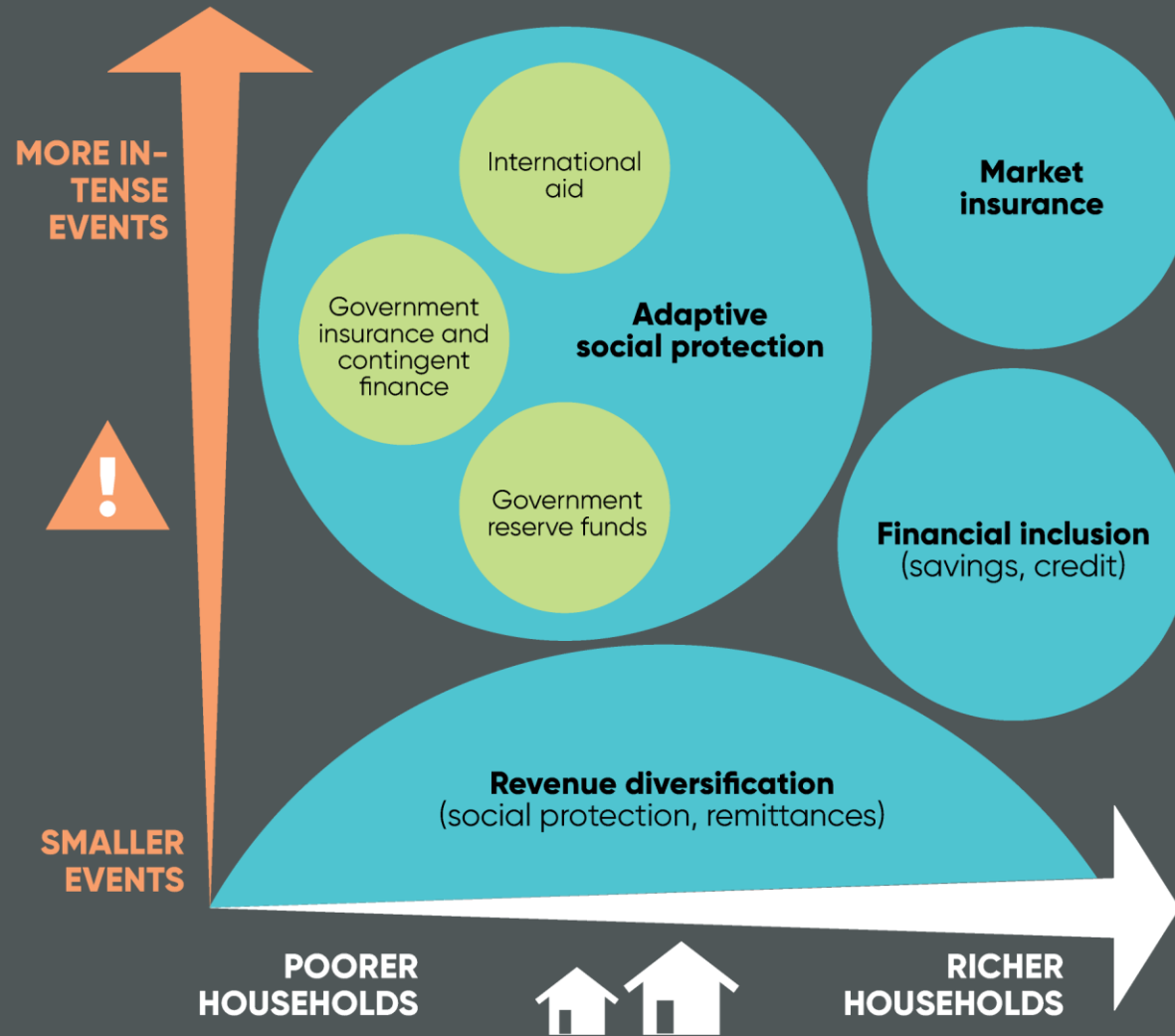
## **MAIN MESSAGE #3**

Policies that make people more resilient can  
save \$100 billion a year.



# A "resilience policy package"

If applied in the 117 countries, well-being losses would be reduced by \$100 billion a year.

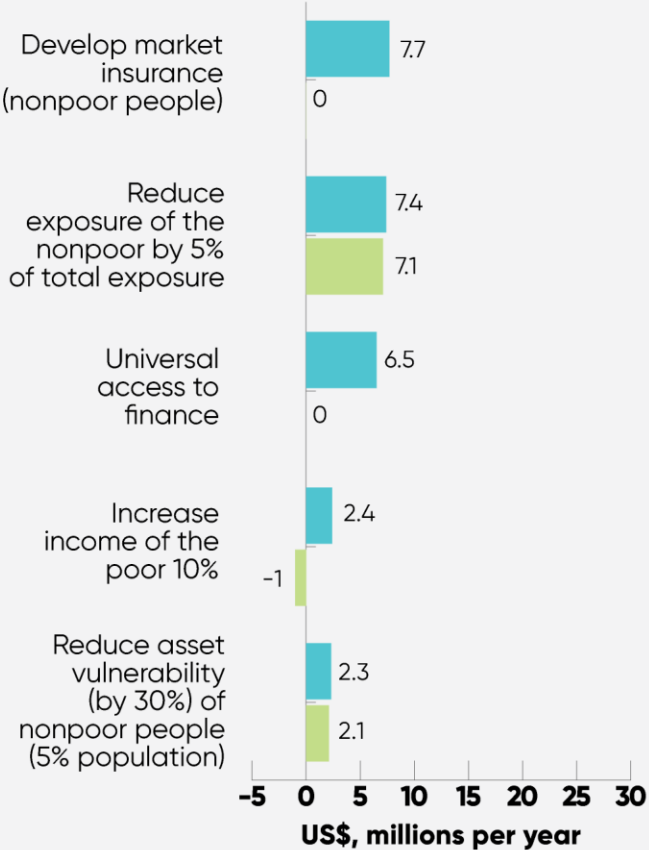
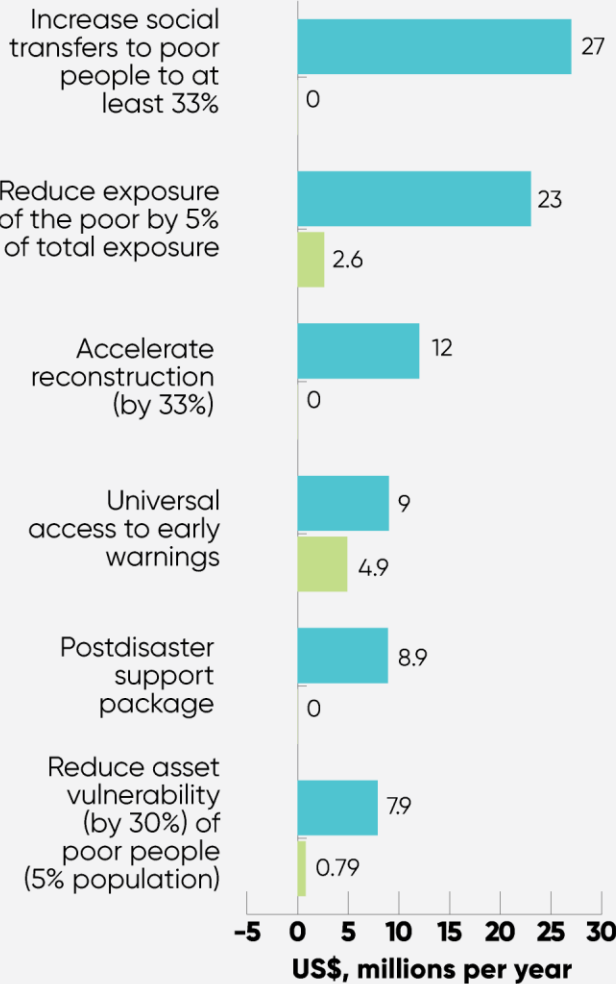


**Strategies need to be designed at the country level.**

**MALAWI**

■ Avoided well-being losses

■ Avoided asset losses

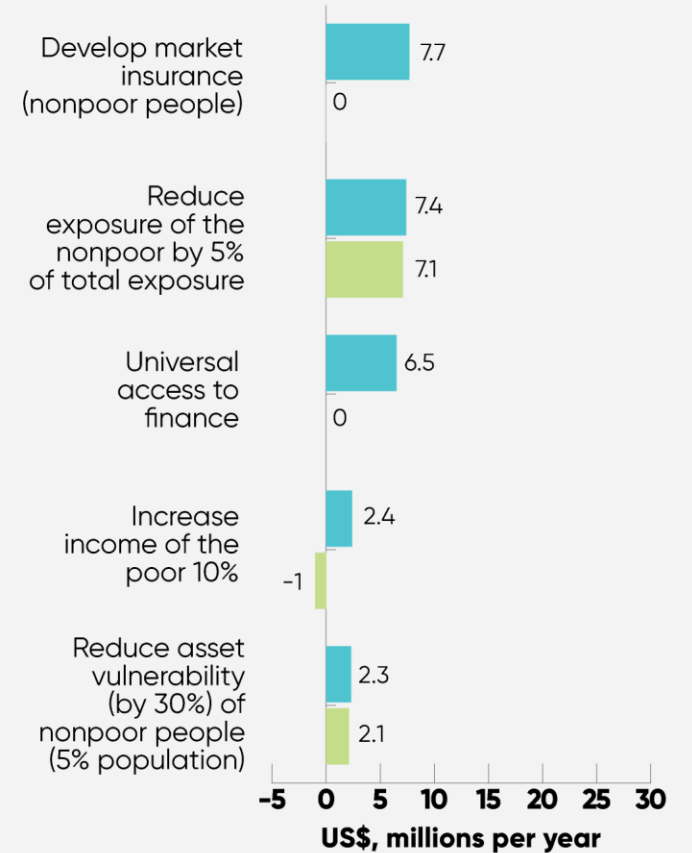
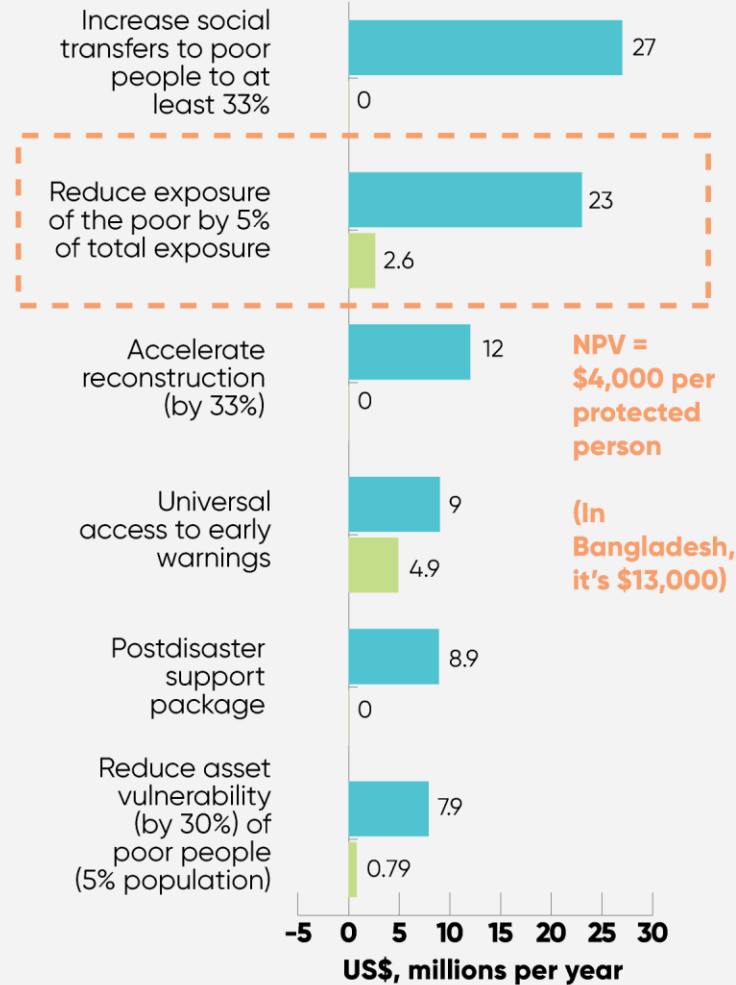


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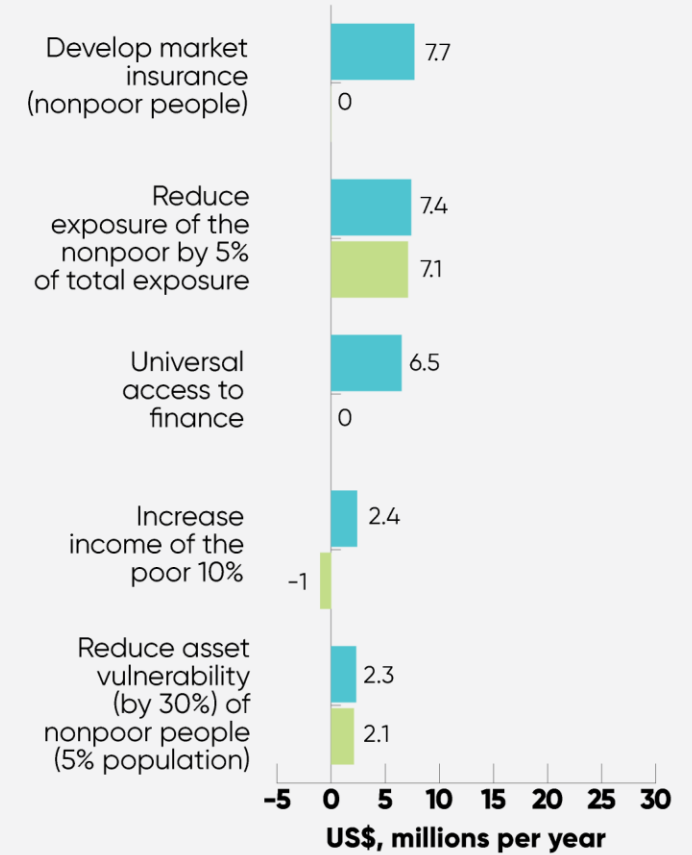
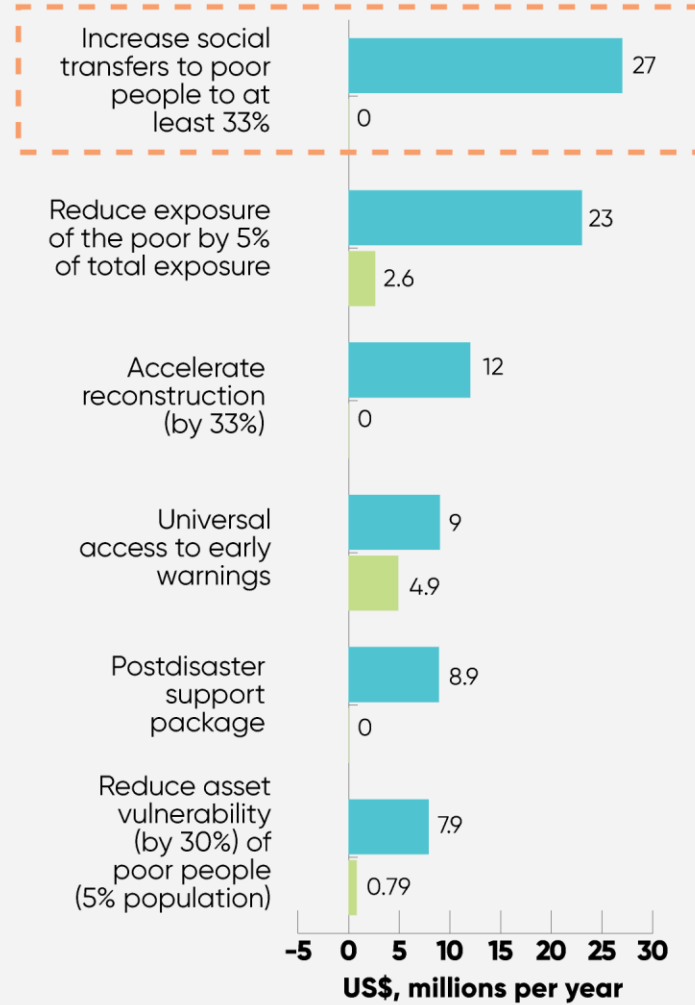


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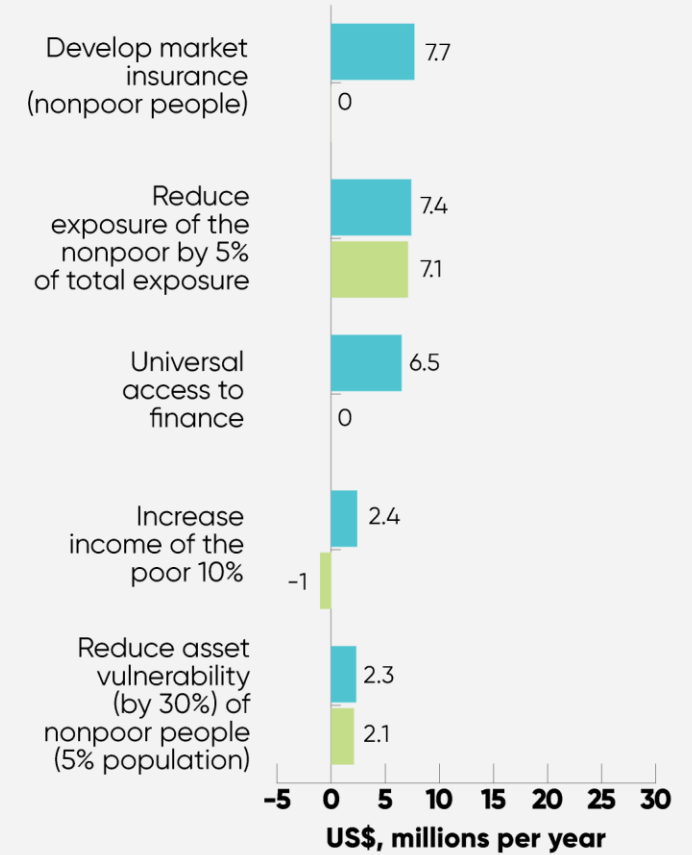
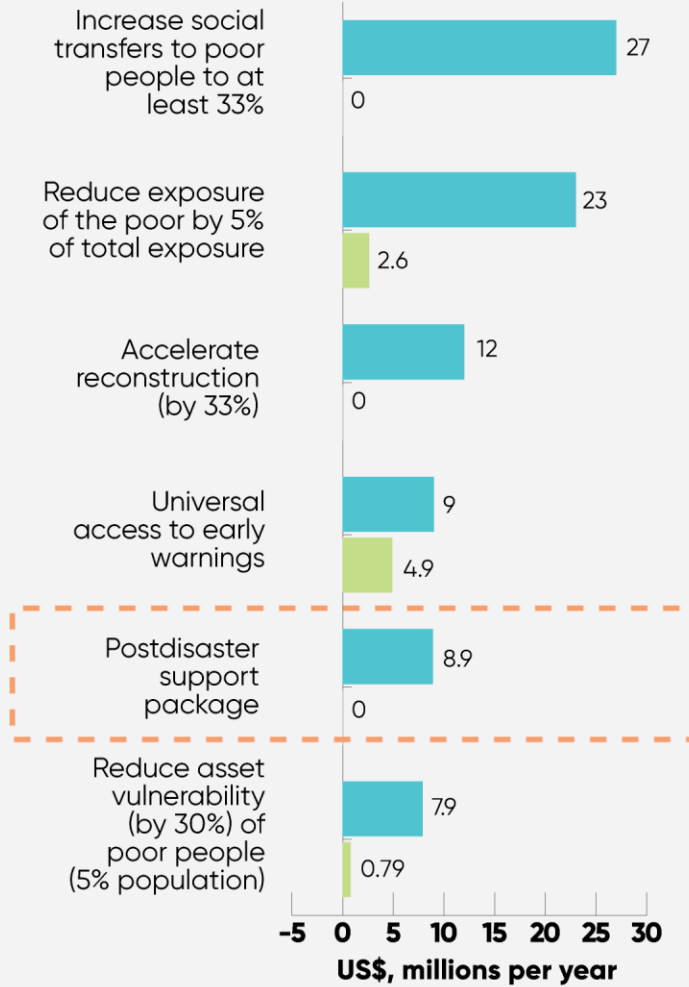


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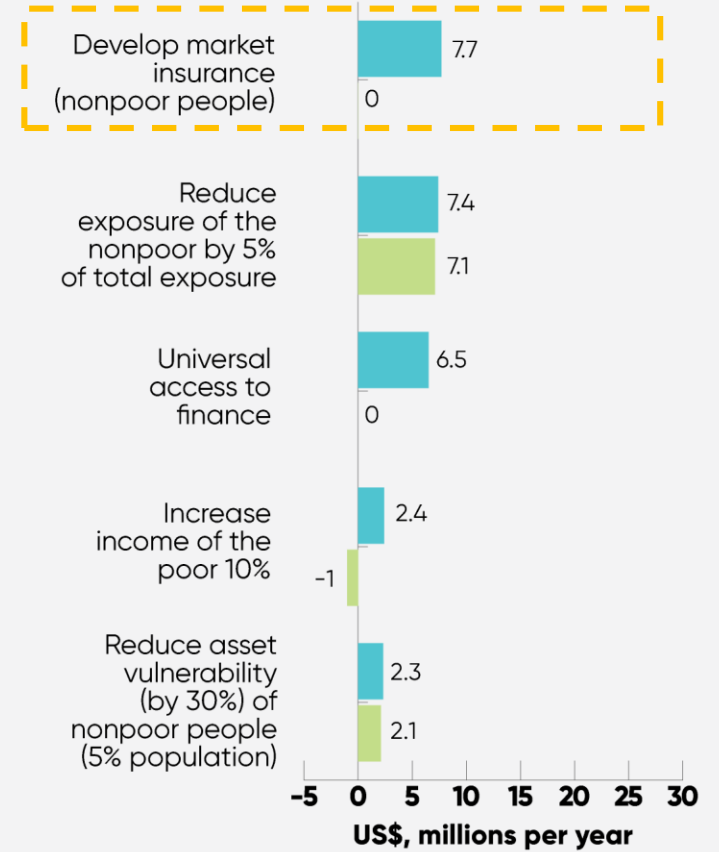
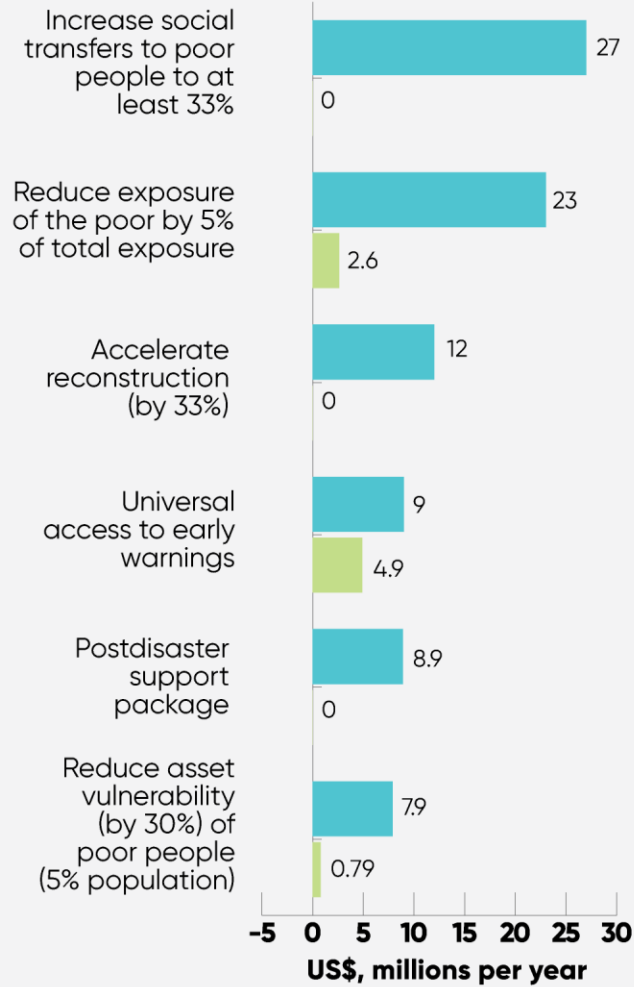
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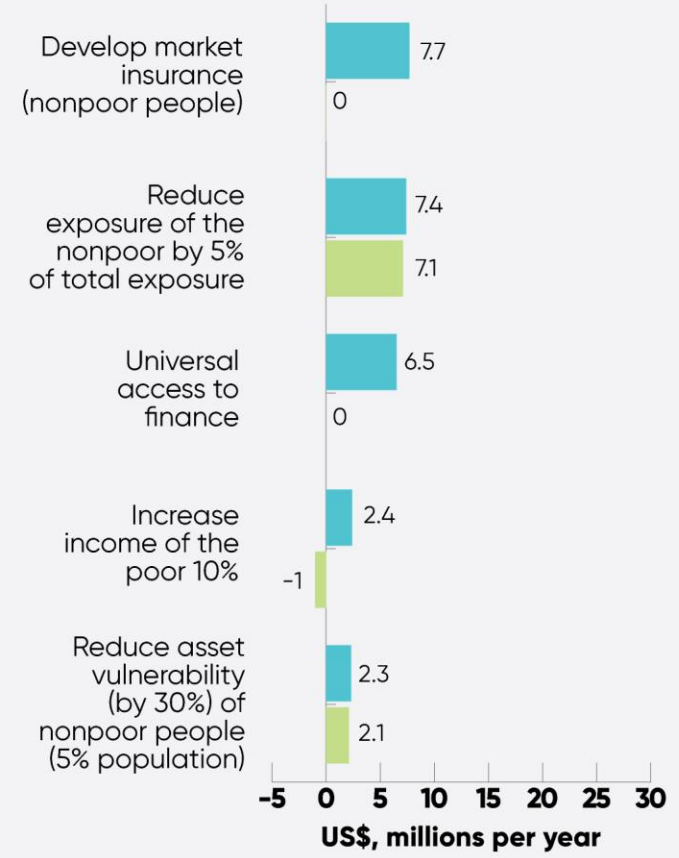
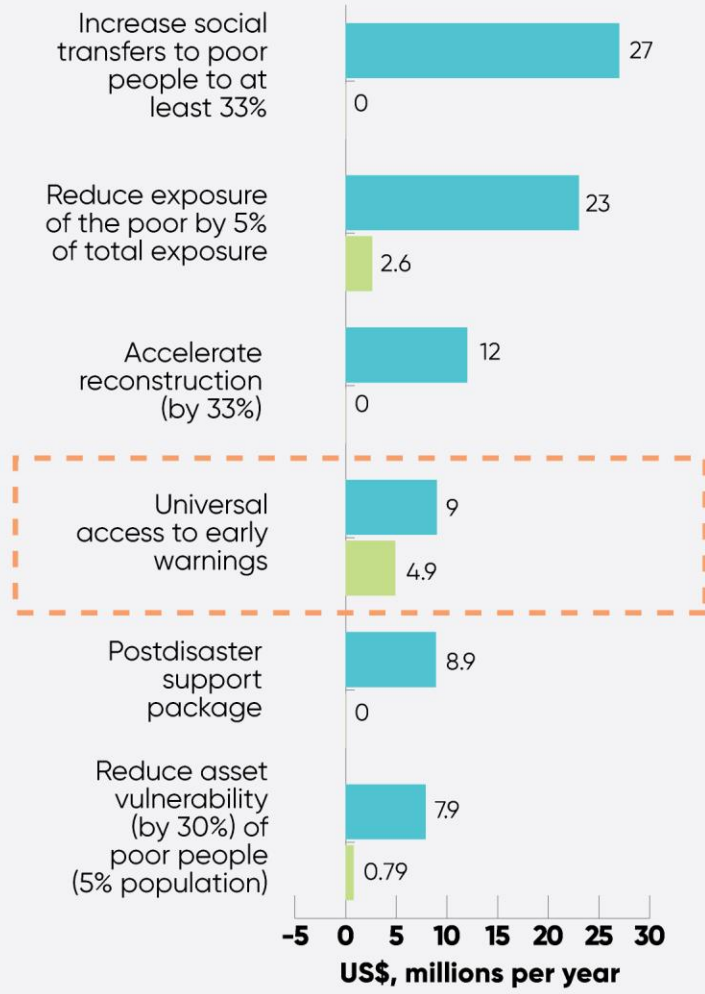


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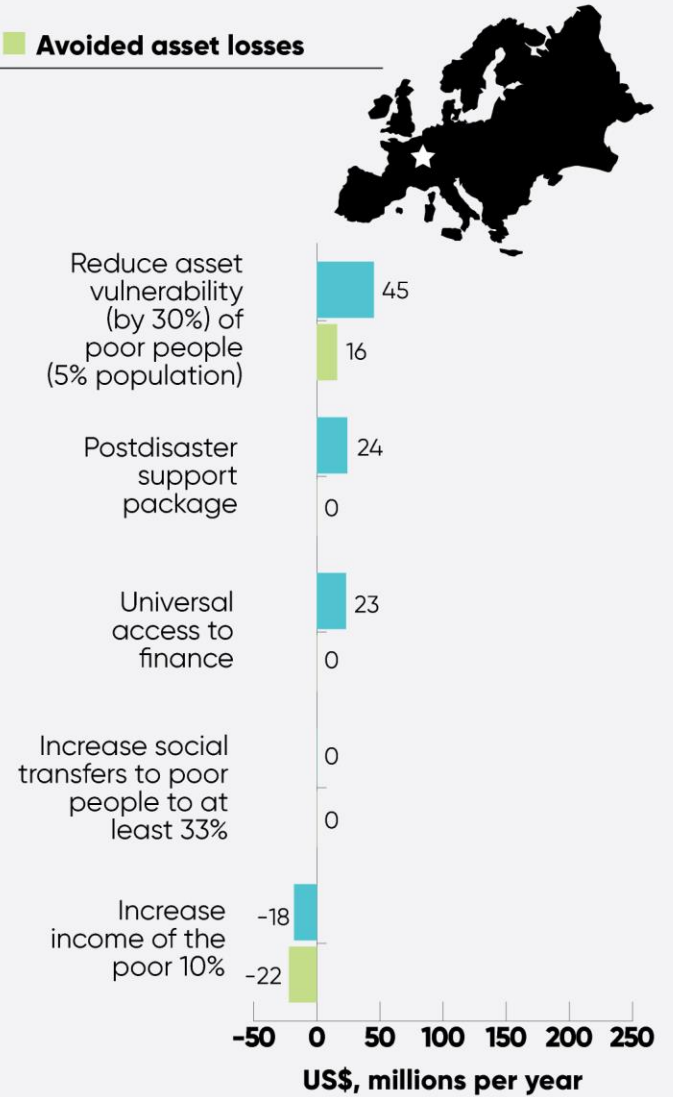
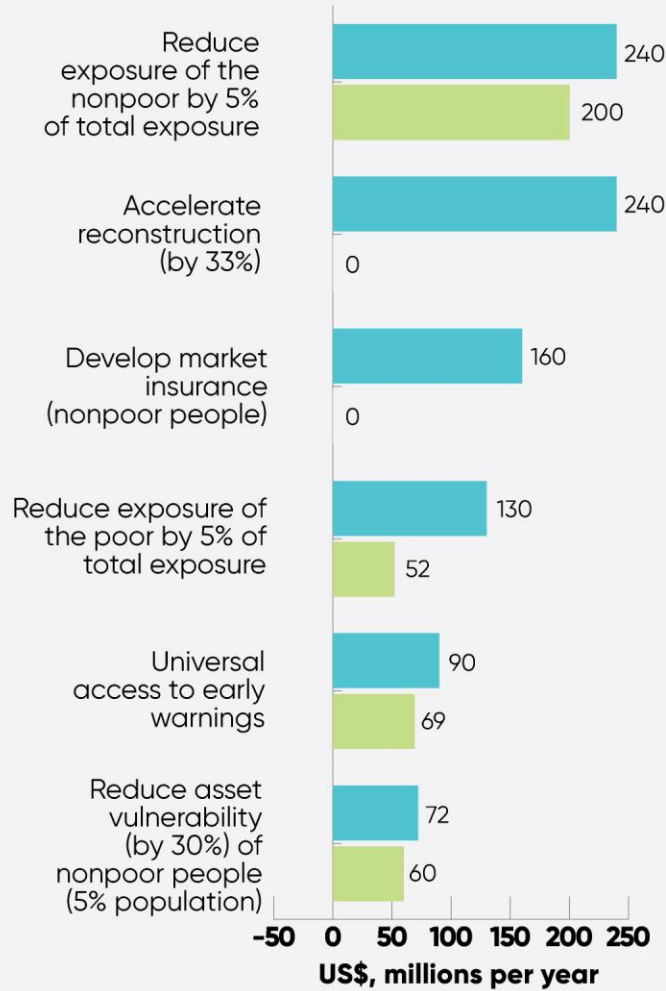




**Priorities are very different in high-income countries: low-hanging fruits are not there any more...**

## GERMANY

■ Avoided well-being losses ■ Avoided asset losses





# A APPENDIX



## Study results for 117 countries

Country	GDP per capita (US\$, PPP-adjusted)	Population (millions)	TODAY			WITH RESILIENCE PACKAGE (AND EARLY WARNING)			Annual well-being gains from resilience package (US\$, millions, PPP-adjusted)
			Risk to assets (% of GDP)	Resilience (%)	Risk to well-being (% of GDP)	Risk to assets (% of GDP)	Resilience (%)	Risk to well-being (% of GDP)	
Albania	\$9,961	3	0.99	69	1.43	0.91	84	1.08	92
Angola	7,488	21	0.15	31	0.48	0.12	60	0.20	441
Argentina	18,087	41	0.44	57	0.78	0.43	73	0.59	1,283
Armenia	7,527	3	0.73	71	1.03	0.70	81	0.86	34
Australia	42,834	23	0.20	72	0.28	0.20	82	0.25	272
Austria	44,056	8	0.24	73	0.32	0.24	82	0.29	113



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» The effects of policy options on well-being and asset losses in 117 countries

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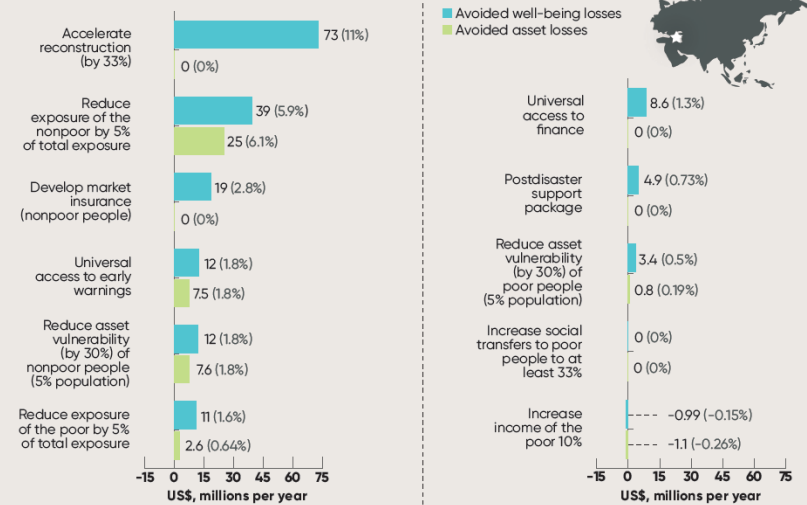
## AZERBAIJAN

Risk to assets: \$410 million (0.26% of GDP)

Socioeconomic resilience: 61%

Risk to well-being: \$670 million (0.43% of GDP)

### EFFECTS OF POLICY OPTIONS—US\$ MILLION PER YEAR (% of current losses)



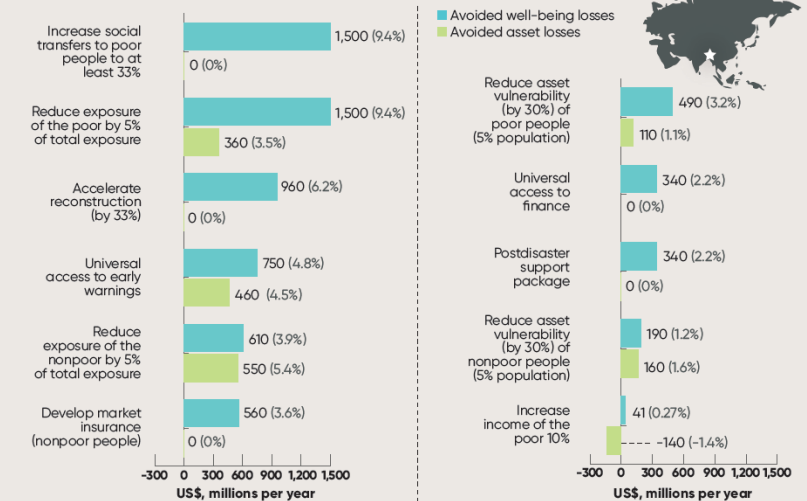
## BANGLADESH

Risk to assets: \$10,000 million (2.3% of GDP)

Socioeconomic resilience: 66%

Risk to well-being: \$15,000 million (3.5% of GDP)

### EFFECTS OF POLICY OPTIONS—US\$ MILLION PER YEAR (% of current losses)



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