

Climate change and poverty

Stephane Hallegatte, Mook Bangalore, Laura Bonzanigo,
Marianne Fay, Tamaro Kane, Ulf Narloch, Julie Rozenberg,
Adrien Vogt-Schilb

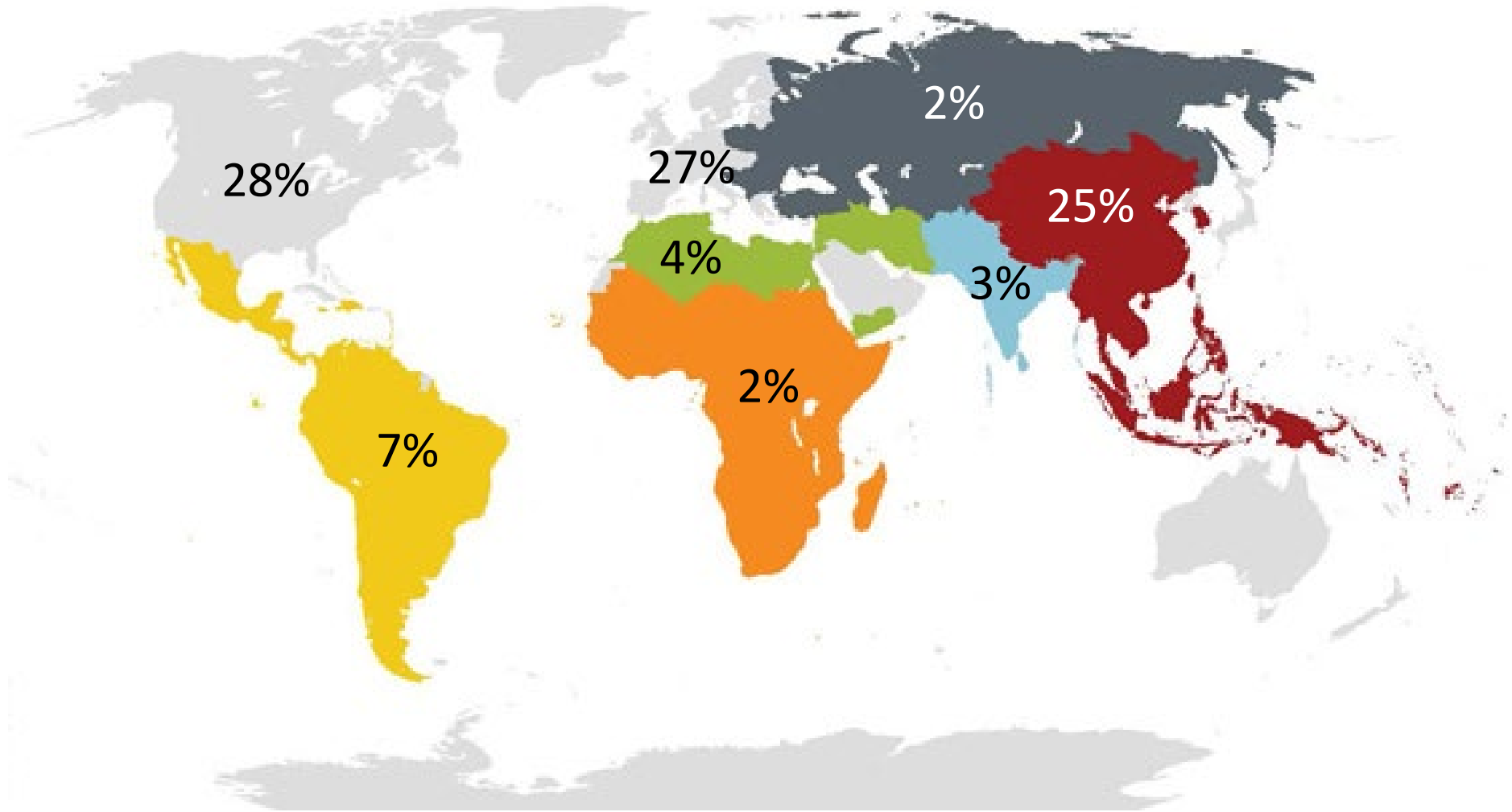
+ discussions with many in the audience today

Climate Change Group, Office of the Chief Economist
The World Bank Group

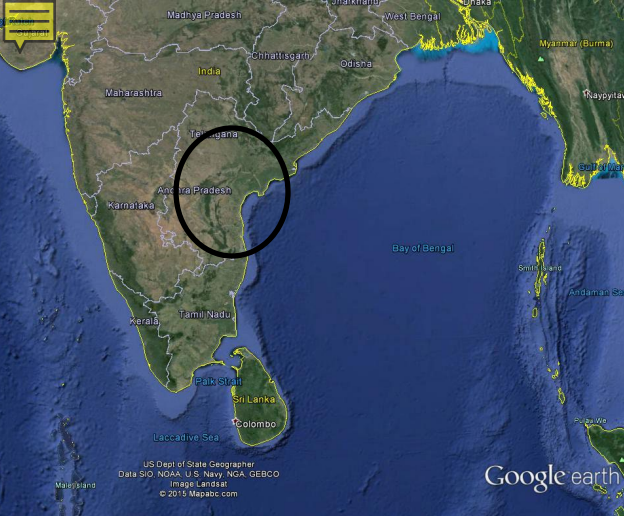
*“the incomplete
estimates of global annual economic
losses for additional temperature
increases of $\sim 2^{\circ}\text{C}$ are between 0.2
and 2.0% of income”*

Intergovernmental Panel on Climate Change,
Working Group II, Summary for Policymakers, 2014

Share of GDP by world regions



What if the real question is not the impact on GDP? What if it is the impact on poverty?





Poverty dynamics

an example in India (Andhra Pradesh)

Flows out of poverty
14% per year



Decreasing flow out of poverty by
10% would decrease poverty
reduction by 50%



Evidence shows that weather
events create poverty traps
linked to health, education,
livestock and other assets



Drought,
irrigation failure,
or crop disease
involved in 44%
of the cases



Increasing flow into poverty
by 10% would decrease
poverty reduction by 50%



Flows into poverty
12% per year

Net flows
2% per year



Non-poor

Poor



Climate change and poverty dynamics

Flows out of poverty



*Extreme poor, living in
remote and fragile/conflict
areas*



Climate change impact
on the ability to
accumulate assets,
impact on children



Climate change
impact on disease
and health, and
natural disasters



*Poor people and
people vulnerable
to poverty*



Flows into poverty

Net flows??



Non-poor

Poor

A report to answer four questions

- Can climate change impacts threaten poverty eradication?
- Can poverty eradication reduce climate change impacts?
- Should we design poverty reduction differently to account for climate change?
- Should we design adaptation and mitigation policies differently because we care about poverty?

A simple analytical framework

$$\text{Max } u(c)$$

Households maximize the utility from their consumption

They consume under a budget constraint and their level of consumption depends on prices

$$p \cdot c \leq y$$

Their income is the sum of the incomes from all their activities

$$y = \sum_{j \in J} a_j \beta_j$$

These incomes depend on their asset stock...

... and of the productivity of these assets

Four (interacting) channels through which climate change and policies can affect poverty

$$\text{Max } u(c)$$

Price and consumption

channel: changes in prices affect consumption

$$p \cdot c \leq y$$

Asset channel: impacts on asset stocks (asset destruction but also incentives to invest)

$$y = \sum_{j \in J} a_j \beta_j$$

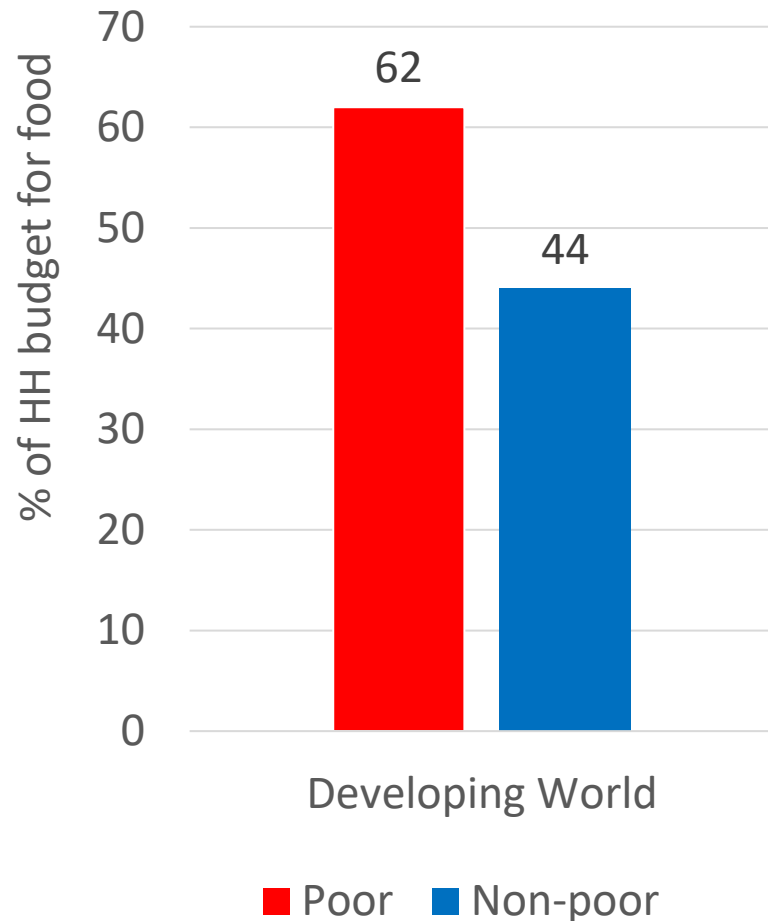
Opportunity channel: impacts on available activities

Productivity channel: impacts on the productivity of assets

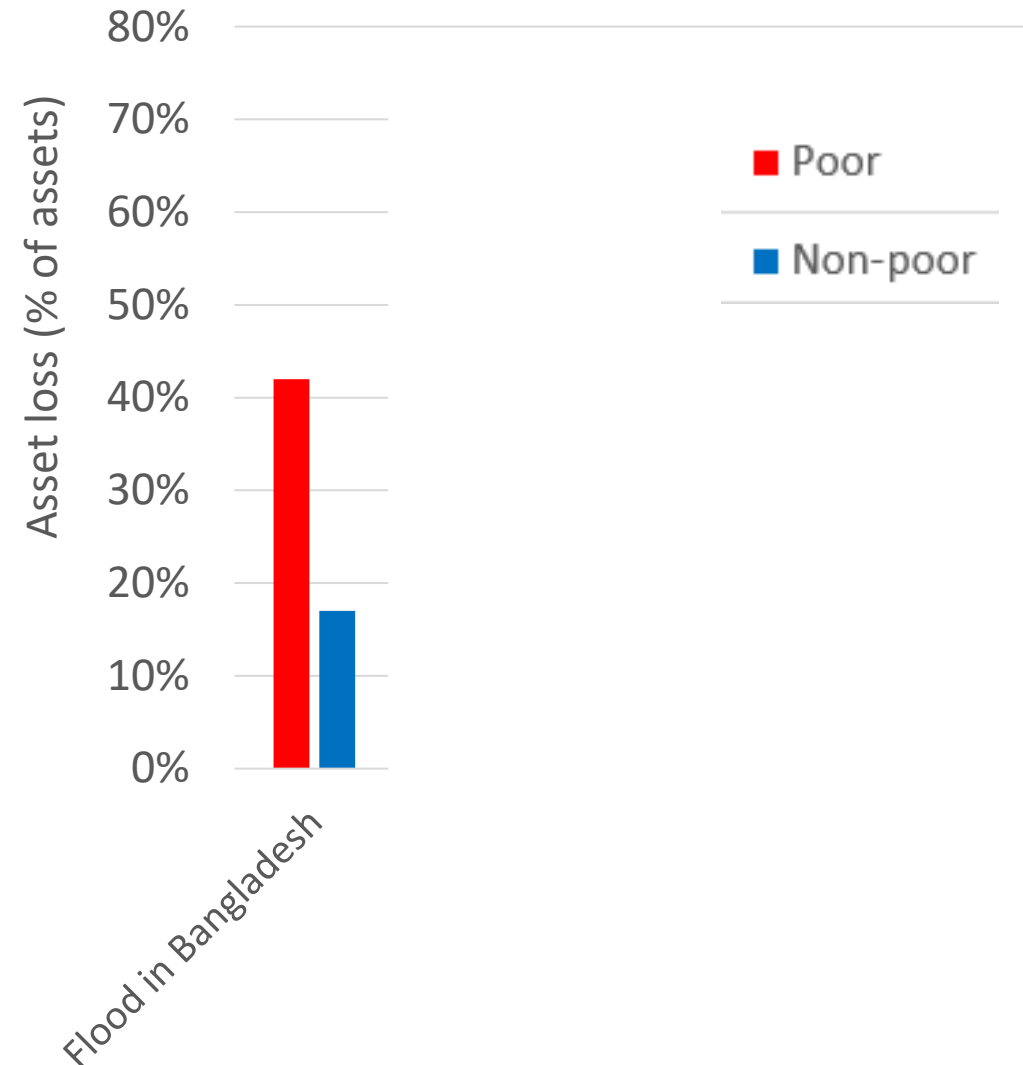
Poorer people are more vulnerable
to the impacts of climate change

Poor people are more vulnerable to these four channels...

... to price changes...

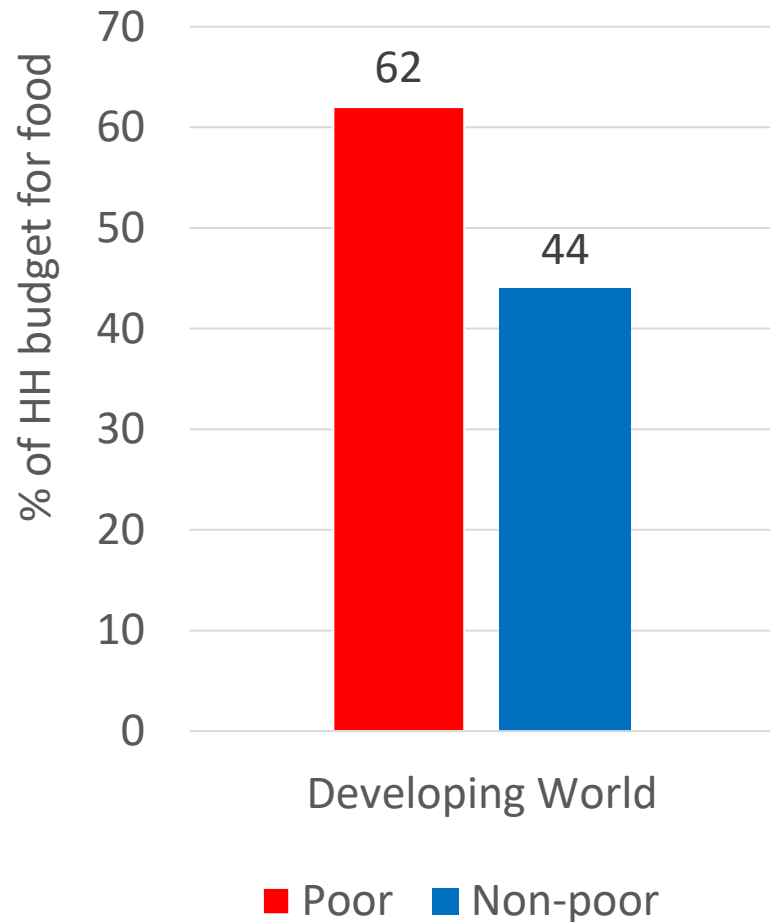


... and to natural hazards...

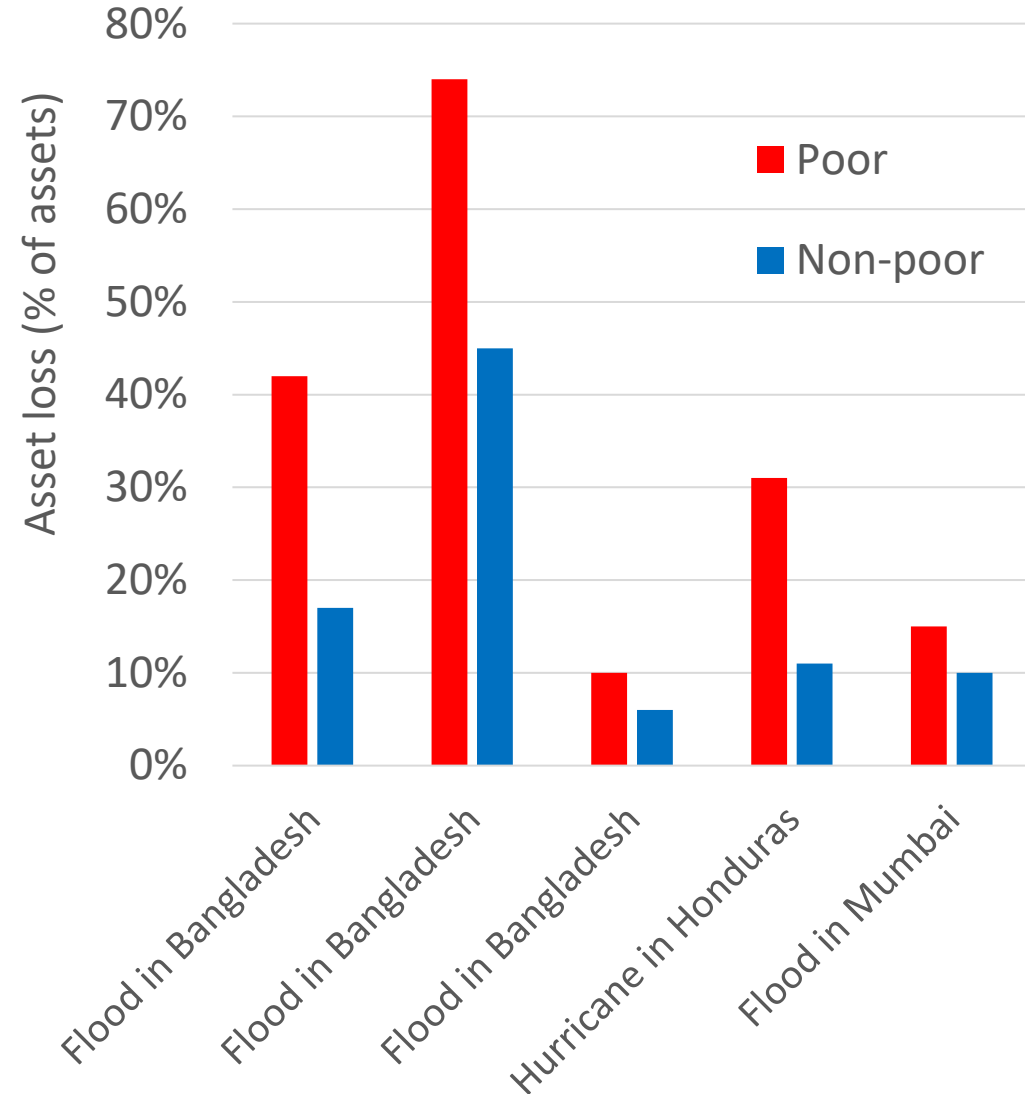


Poor people are more vulnerable to these four channels...

... to price changes...



... and to natural hazards...



... and have less access to support to cope and adapt

		Saved at a financial institution (FINDEX data)	Average transfer from social protection (ASPIRE data)
Indonesia	Poor	8%	\$0.5/day
	Non-poor	21%	\$2/day



... and have less access to support to cope and adapt

		Saved at a financial institution (FINDEX data)	Average transfer from social protection (ASPIRE data)
Indonesia	Poor	8%	\$0.5/day
	Non-poor	21%	\$2/day
Malawi	Poor	4%	\$0.05/day
	Non-poor	11%	\$0.17/day

And health insurance?



Fortunately, the vulnerability of poor people is not cast in stone

What can development bring us?





What kind of world will be affected by climate change?

How successful are we
in mitigating climate
change by 2030?

Very successful
(and low climate
sensitivity)

Not successful (and
large climate
sensitivity)

Not so
successful

Very successful
(3% + universal
basic services)

How successful are
we in eradicating
poverty by 2030?

What kind of world will be affected by climate change?

How successful are we
in mitigating climate
change by 2030?

Very successful
(and low climate
sensitivity)

Not successful (and
large climate
sensitivity)

Pessimistic
scenario

Not so
successful

Very successful
(3% + universal
basic services)

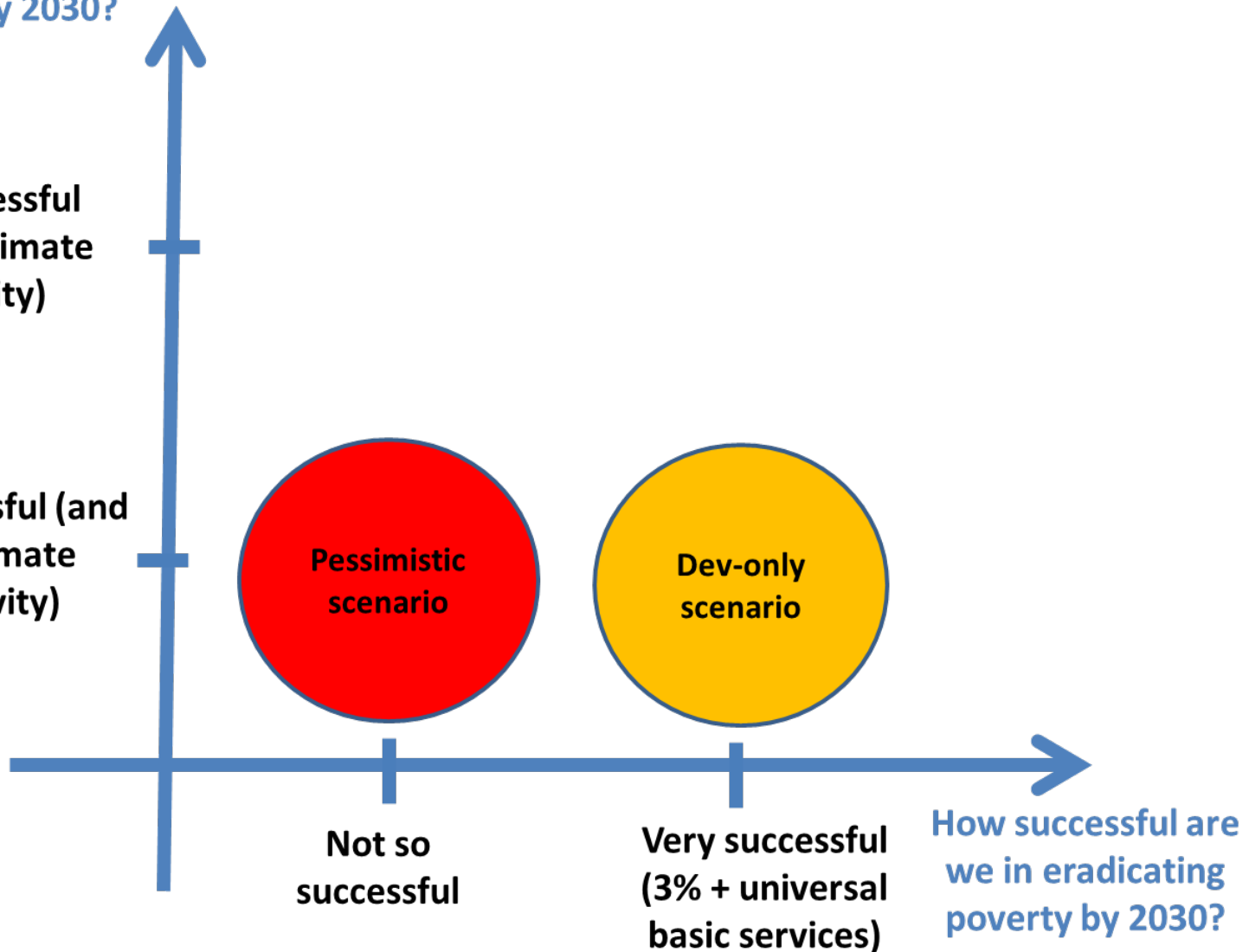
How successful are
we in eradicating
poverty by 2030?

What kind of world will be affected by climate change?

How successful are we
in mitigating climate
change by 2030?

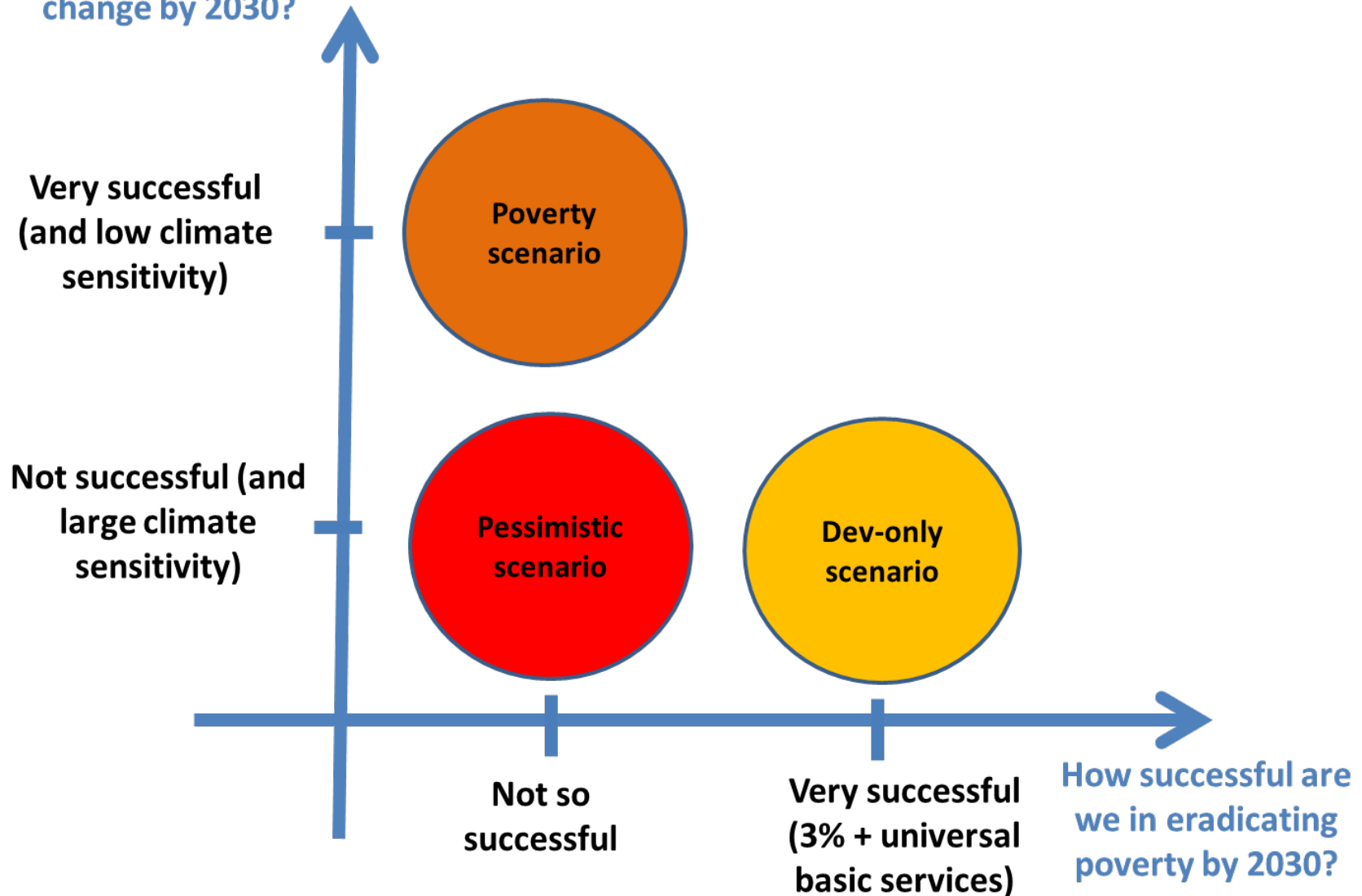
Very successful
(and low climate
sensitivity)

Not successful (and
large climate
sensitivity)



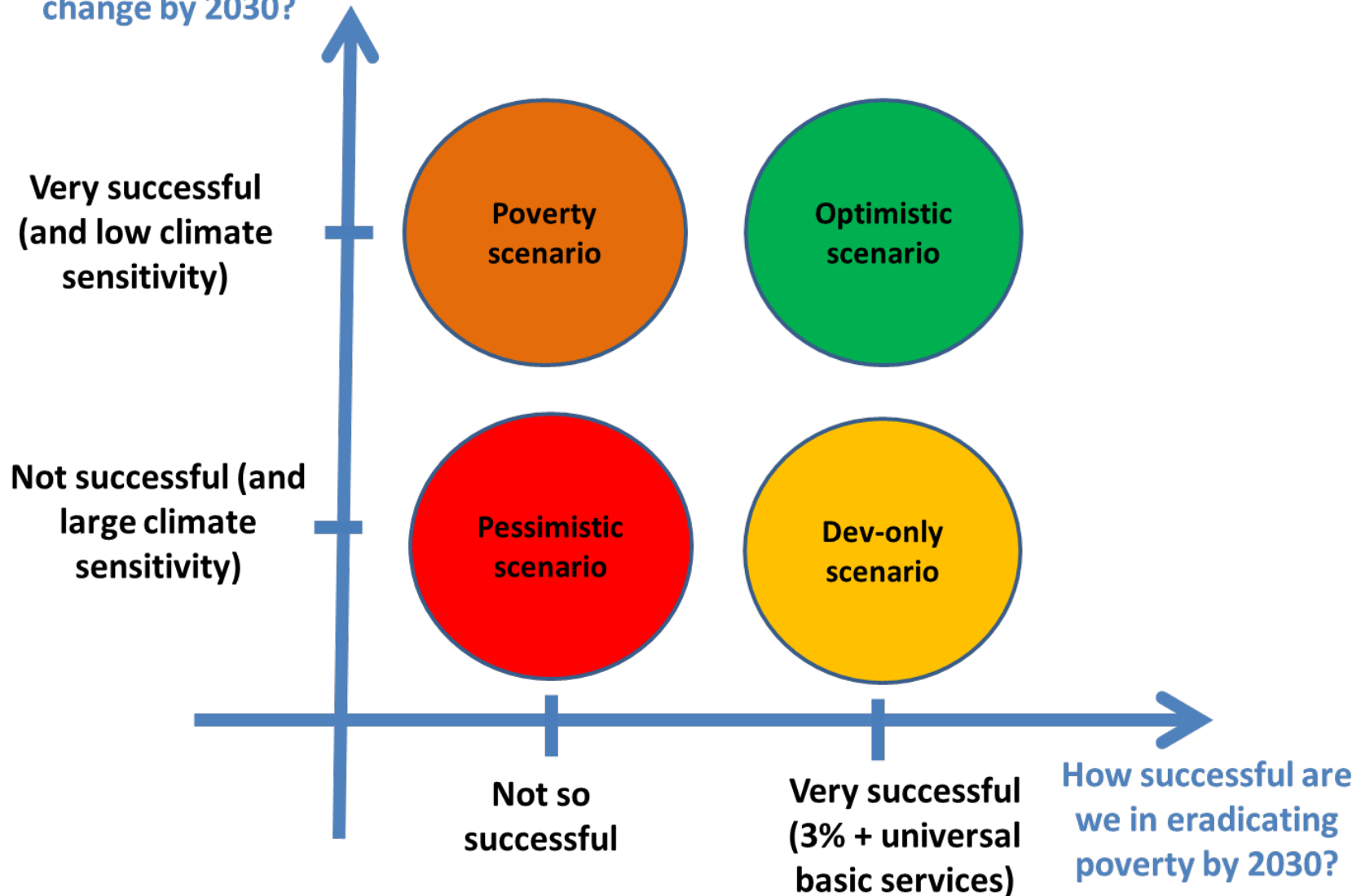
What kind of world will be affected by climate change?

How successful are we
in mitigating climate
change by 2030?

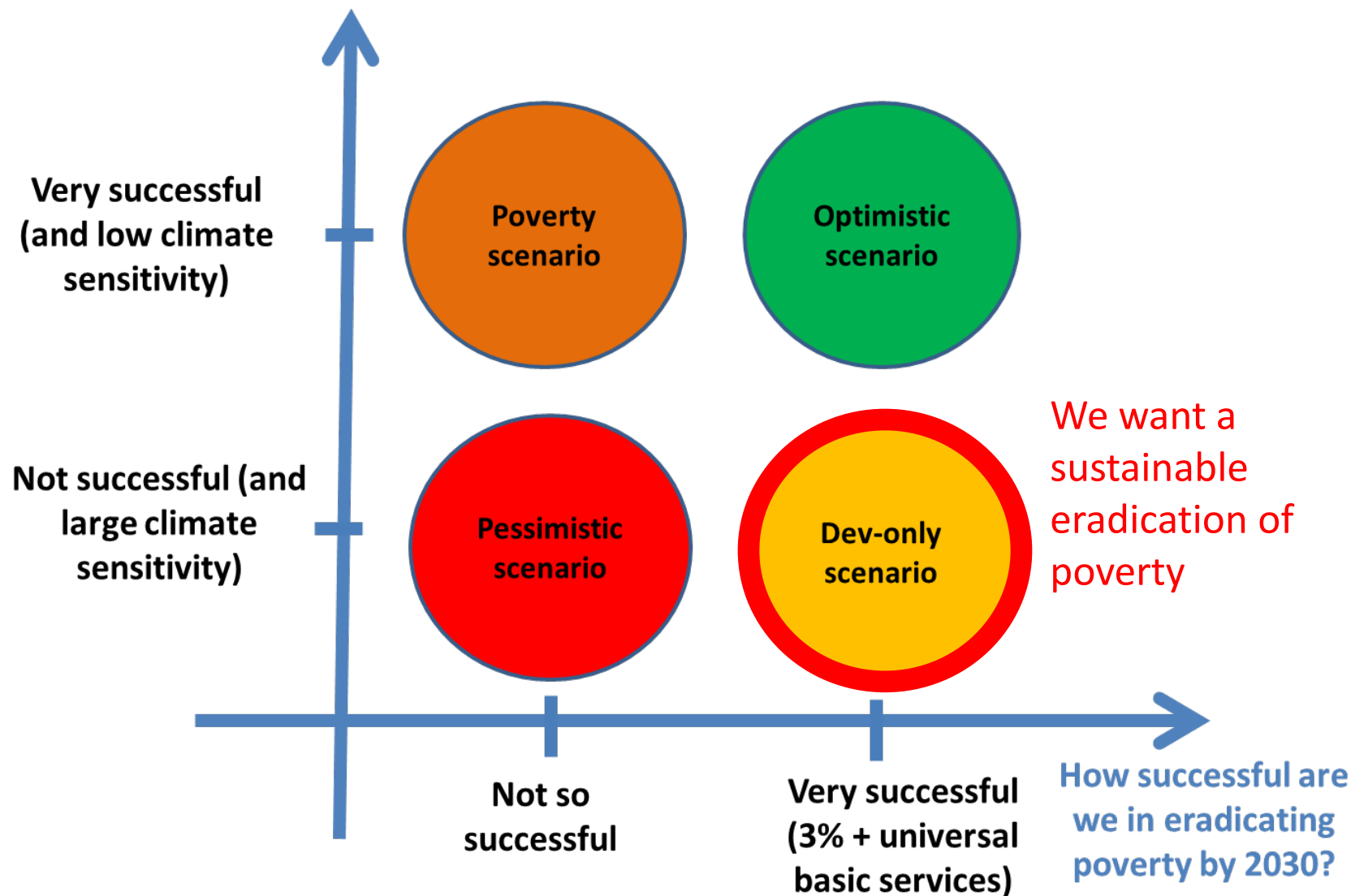


What kind of world will be affected by climate change?

How successful are we
in mitigating climate
change by 2030?



Are these scenarios possible? What about the long-term?
What about trade-offs between short-term and long-term?



Good policies can help

Ill-designed climate policies can go against poverty reduction

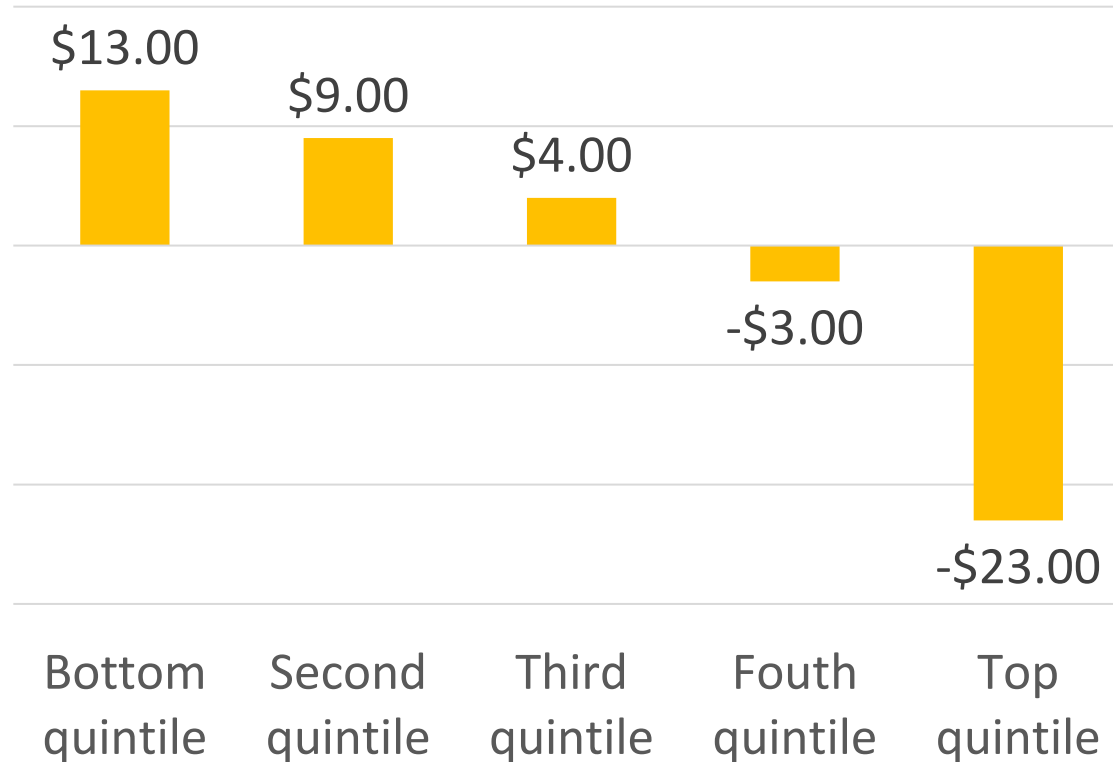
- Support to coastal protection focused on “high value” land would benefit the rich, and may crowd out public programs that benefit poorer people
- Energy prices and access, REDD+ and land rent, etc.
- **Distributional impacts will depend on power relationship, governance, and the voice of poor people**





Well-designed policies benefit the poor

Distributional impacts of replacing \$100 of fossil fuel subsidy by a universal cash transfer



When it reformed energy subsidies, **Indonesia** deployed a program of cash transfers which provided 30% of the population with \$30 per quarter, significantly more than the increase in energy costs.

Source: based on Arze del Granado et al (2012)

Similarly, carbon pricing can raise revenue that can be used for poverty reduction (CT, infrastructure, etc.)

There are efficient, low-cost options

- 1970 cyclone claimed over 300,000 lives in Bangladesh.
- Cyclone of similar magnitude resulted in about 4,000 fatalities in 2007 thanks to:
 - A **nationwide program to build shelters** —from 12 shelters in 1970 to 2,500 in 2007
 - An improved **forecasting** capacity and a simple but effective system for **warning** the population



Source: World Development Report 2014

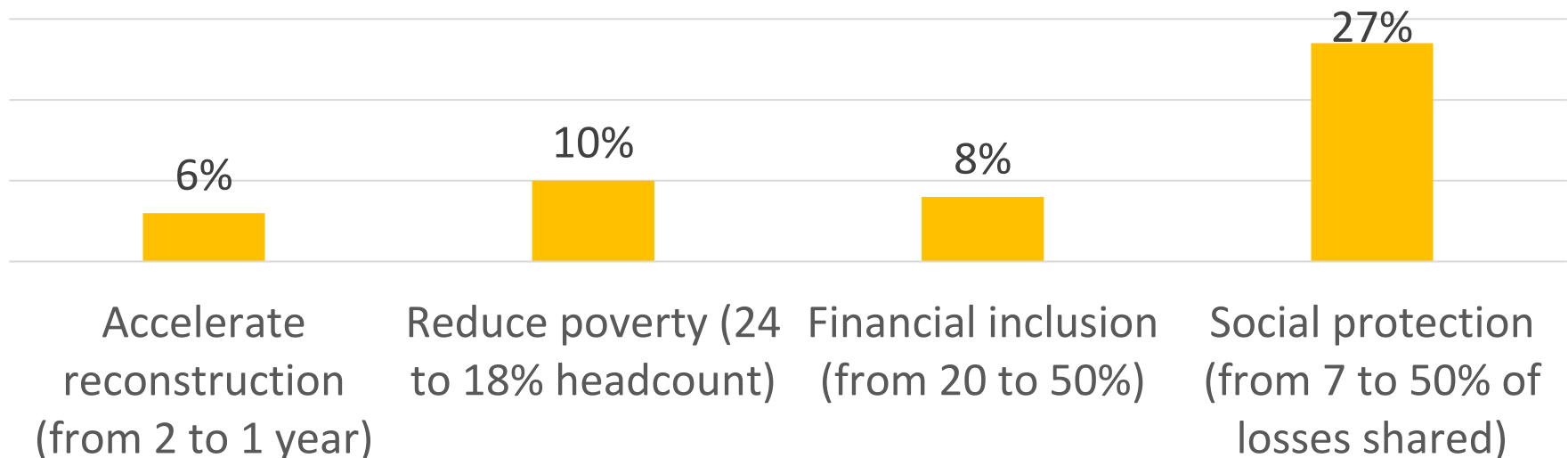
The critical role of well-targeted, scalable safety nets

- 1999–2000 drought in Ethiopia:
 - the poorest 40% lost 60 to 80 percent of their assets;
 - the wealthiest lost just 6 percent.
- Ethiopia's safety net supports 7.6 million chronically food insecure people.
 - **Protects** the most vulnerable from food insecurity
 - **Builds** community assets to counteract the effects of droughts through public works



Source: World Development Report 2014

Reducing welfare losses from floods in Mumbai by reducing vulnerability



(Preliminary) main messages

- Climate change impacts will represent an obstacle to the sustained eradication of poverty.
- Climate policies benefit the poor if they are designed accordingly and accompanied with social protection measures.
- Reducing the poverty impact of climate change requires strengthening social protection systems, and to make them scalable and well targeted.
- **Climate change impacts will increase over time. There is a window of opportunity to reduce poverty now and make the global population less vulnerable to its impacts.**