K4D | Knowledge, evidence and learning for development

The costs of climate change adaptation in middle-income countries

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Introduction

Challenge 1: Middle-income countries (MICs) are predicted to be among the most vulnerable to climate change (CC) and high rates of poverty.

Challenge 2: Estimates on the costs of CC adaptation in MICs are limited, but there is consensus that current funding is highly inadequate.

Challenge 3: Evidence on effective strategies to fill this finance gap are limited.

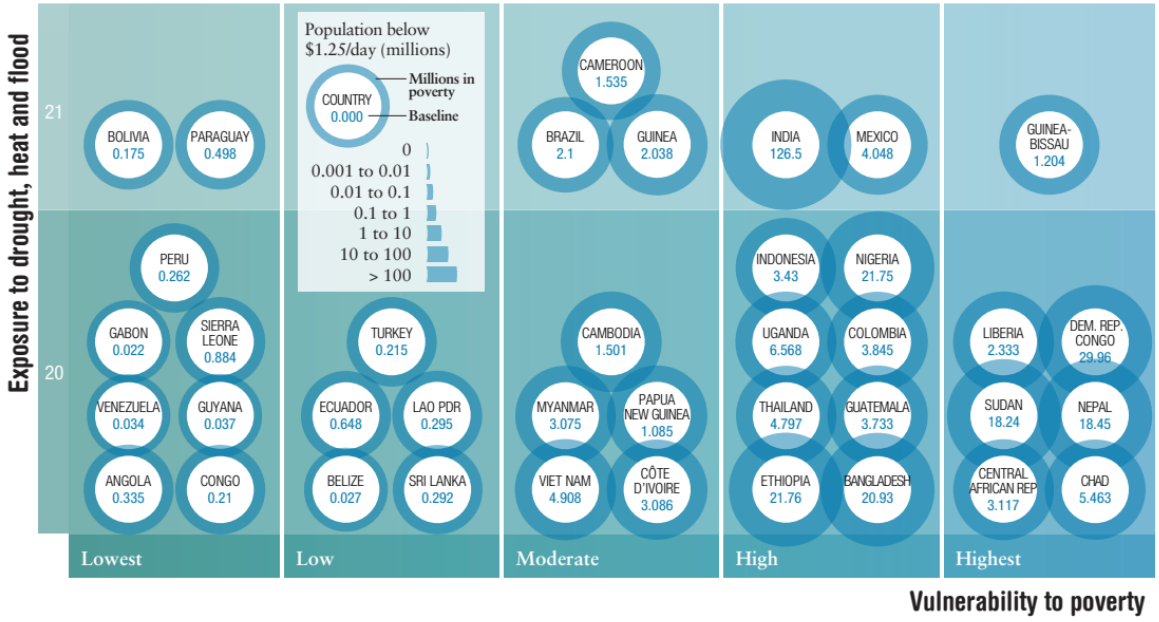
1. Global vulnerability and adaptive capacity

- Low-income countries (LICs) have the highest risk of exposure and lowest adaptive capacities.
- MICs with the highest exposure and lowest capacity: Sudan, Yemen, Congo, Nigeria, Angola, Pakistan, Papua New Guinea

Exposure, defined by ND-GAIN (Chen et al., 2015), considers the extent to which human society and its supporting sectors are stressed by the future changing climate conditions. Indicators include effects on agricultural yields, water availability, climate related deaths, damage to infrastructure. Adaptive capacity is defined as the ability of society and its supporting sectors to adjust to reduce potential damage and respond to negative consequences of climate change. Indicators include food import dependency; water dependency; urban density, and dependence on energy imports.

1. Climate vulnerability and poverty in MICs

Figure B: Projected poverty levels in 2030 in countries with the highest exposure to droughts, extreme heat and floods



NOTE: The figure shows a set of countries with the highest exposure to the three hazards in 2030, plotted against their 'vulnerability to poverty', which is a measure of the risk they face of future poverty when presented with shocks, such as 'natural' disasters (see Chapter 2). The circles indicate projected poverty numbers for each of the countries in 2030 assuming a baseline projection. These countries differ from figure A as it features just the countries particularly exposed to the three hazards rather than the full list of five hazards included in figure A.

Between 176 and 319 million extremely poor people are predicted to be living in the 45 countries most exposed to drought, extreme temperatures and flood hazards by 2030. Middle-income countries make up the largest share: India, Nigeria, Sudan

1. Human and economic costs of CC in MICs

Poverty: two-way relationship - people living in poverty are disproportionately affected and CC is pushing people into poverty.

- In Myanmar, poor people tend to live in flood prone areas and flooding has been shown to exacerbate poverty. (Kawasaki et al., 2020)

Food security: undernourishment is predicted to rise by 5-10 million to120-170 million people by 2080 due to CC. (Schmidhuber & Tubiello, 2020)

- In India, crop yields are expected to decrease by 38%-56% without adaptation. (Fischer et al., 1996)

Health: CC is predicted to cause an additional 250,000 deaths/yr 2030-2050 from malnutrition, malaria, diarrhoea and heat stress. (WHO, 2018)

- In Mexico, diseases linked to CC are the leading cause of mortality among children 5-14. (Riojas-Rodríguez et al., 2018)

2. Costs of adaptation in MICs

- Estimates on adaptation costs vary widely due to data constraints and assumptions on the degree of CC, what to include, what things cost, etc.

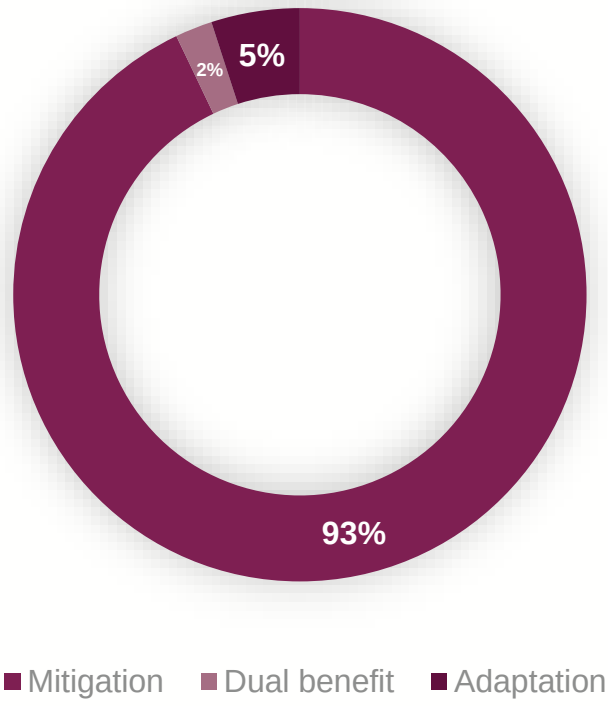
- UNEP's review of estimates (2016) on adaption costs in LICs and MICs: USD 140 billion - USD 300 billion by 2030; USD 280 billion - USD 500 million by 2050. (UNEP, 2016)

- Urban infrastructure adaptation is expected to make up a large proportion of total costs.

2. Trends in adaptation finance

- The proportion of climate finance for adaption has not changed since 2015 at 5%. (Buchner et al., 2019)

- In absolute terms, adaptation finance increased by 35% between 2015/16 – 2017/18. (Buchner et al., 2019)

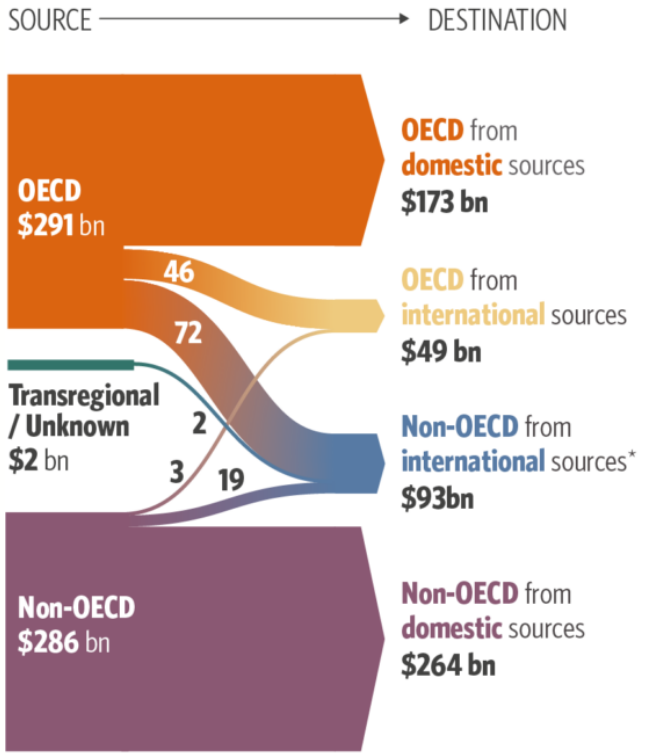


Source: Authors' own based on data from Buchner et al. (2019). © 2019 Climate Policy Initiative, Inc. Reprinted under CC BY-NC-SA 3.0.

2. Trends in adaptation finance

- Most climate finance (76%) stays in the country of origin.
- The makeup of climate finance is disproportionate with predicted impact (C1).
- Increasing the share of adaptation finance would need to see more transfer from OCED to non-OECD.

Climate finance flows by OECD status of source and destination (USD billion, 2017/18 annual average)



Flows with transregional destination are assumed to be directed to non-OECD countries.

3. Strategies to fill the finance gap

Complimentary programming to leverage existing national funds: research, extension & training, transitional assistance, trade policy, infrastructure development.

The private sector is not acting on the estimated USD 23 trillion in opportunities for 'climate smart' investments in emerging markets up to 2030. (Buchner, 2019) Adaptation's focus on avoiding future human and economic costs is less aligned in principle with revenue creation. "Governments have the unique opportunity to drive ambition and increase climate finance" (UNEP, 2018)

Decentralised spending can offer good value for money. Local institutions are often receptive to local needs, participatory, accountable.

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