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Does World Bank Climate Adaptation Finance Go to the Most Vulnerable Countries?

NANCY LEE · SAMUEL MATTHEWS · JAMES REID

Abstract

Global underinvestment in climate adaptation increases the importance of ensuring that such finance is well targeted and well spent. Multilateral development banks (MDBs) are the largest public source of adaptation finance for developing countries, and the World Bank accounts for about half of the MDB total. In this paper, we test the hypothesis that World Bank allocation of adaptation finance prioritizes countries that are more exposed to the effects of climate change and less able to adapt on their own.

Using 10 years of World Bank projects and the ND-GAIN country index, we analyze the distribution of adaptation finance by grouping countries according to their vulnerability, defined by their exposure to climate change and capacity to adapt. The most vulnerable countries tend to be very poor, concentrated in sub-Saharan Africa, dependent on agriculture, more fragile and conflict-affected, and burdened by weaker governance. We find that the most vulnerable countries with low adaptive capacity received relatively less adaptation finance than countries with higher adaptive capacity over the period (2014–2023). World Bank adaptation finance meets only a small fraction of their needs. The finance mostly funds climate-resilient infrastructure, but surprisingly little climate-resilient agriculture. The World Bank has greatly ramped up adaptation finance for these countries over the period, but low-capacity countries still get relatively less.

Four policy implications flow from this analysis: (1) an expanded IDA is vital as the most important source of adaptation finance for these countries; (2) countries that are both climate vulnerable and fragile/conflict-affected should receive special access to IDA resources: a "top-up" in their performance-based allocations; (3) a greater World Bank upstream project development effort is essential to make it possible to productively spend more IDA adaptation finance in these countries; and (4) increased support for climate-resilient agriculture would yield high economic, social, and security returns.

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Introduction

An array of factors is driving a sharp rise in the MDB focus on finance for climate adaptation and resilience: (1) growing global evidence of climate-related losses, risks, and drags on growth; (2) fading hopes that goals for emissions reductions and ceilings for global temperature rises will be met; (3) recognition that the growth of mitigation finance has significantly outpaced adaptation finance; and (4) evidence that poorer countries that contribute trivial amounts to global emissions are among those most vulnerable to climate-related damage and risks.

For these reasons, spurred by both borrowing and non-borrowing shareholders, MDBs have recently boosted their adaptation finance flows and made significant commitments to further increases. From 2016 to 2023, collective MDB adaptation finance to low- and middle-income countries (LICs and MICs) rose from $5.8 billion to $24.7 billion, according to their joint climate finance reports.[1]

In November 2024, MDB heads made ambitious new adaptation finance commitments.[2] Their annual collective climate finance target for low- and middle-income countries is $120 billion by 2030, including $42 billion for adaptation. They aim to mobilize $65 billion from the private sector in total climate finance but have not published a mobilization goal for adaptation finance where private flows have been limited to date. The Climate Policy Initiative (CPI) found that the private sector invested an average of $4.7 billion a year between 2019 and 2022 for adaptation globally (including advanced economies) compared to hundreds of billions for mitigation.[3]

The focus on expanded adaptation finance volume is welcome, but targeting effectiveness and impact is just as important. This paper explores the first step at the country level: understanding the relationship between the allocation of MDB adaptation finance and country climate vulnerability.

The latest joint MDB climate finance report breaks down adaptation finance to LICs and MICs by MDB, sovereign versus non-sovereign finance, instrument, region, and sector, but not country.[4] The data show that: the World Bank Group plays a major role (51 percent of total MDB adaptation finance), nearly all finance goes to the public sector (93 percent), and half of adaptation finance goes to sub-Saharan Africa and South Asia.

This paper examines whether the World Bank's adaptation finance goes to the most climate vulnerable countries. It pursues that question across five dimensions:

- What is the best way to assess country climate vulnerability for this purpose?
- What characteristics do the most vulnerable countries share?

1 2016 and 2023 Joint Reports on Multilateral Development Banks' Climate Finance.
2 World Bank Group, 2024.
3 Naran et al., 2024.
4 2023 Joint Report on Multilateral Development Banks' Climate Finance.

- Do the most vulnerable countries get relatively more adaptation finance by various finance intensity measures?
- Is adaptation finance intensity growing over time?
- How is the finance allocated across different adaptation activities?

The paper identifies a set of countries with high exposure to climate risk and damage and limited capacity to adapt to those risks. And it defines a subset of the most vulnerable countries in the world: those that are both the most exposed and the least capable of adapting. *We test the hypothesis that the World Bank targets countries at most risk, based on both exposure and adaptive capacity.*

But it is important to note that many factors, in addition to climate vulnerability, shape the composition of World Bank lending to a given country: the country's development and income status, the alignment of the Bank's product offerings with country needs, the country's borrowing preferences and priorities, the country's capacity to deploy finance productively, and evolving shareholder finance priorities. Variations in country capacity, in particular, complicate allocation. Limits on capacity both increase the importance of World Bank engagement and constrain opportunities for productive support unless addressed.

In addition, for most sectors, adaptation and resilience objectives are intertwined with development objectives. The share of adaptation activities and finance in a given country therefore is in large part a function of that country's sectoral priorities.

Defining which are the most climate vulnerable countries

There are several ways to identify climate-vulnerable countries, including membership in organizations like the V20,[5] geographical features like the Small Island Developing States (SIDS),[6] and rankings by country indexes. Quantitative indexes allow for the most granular analysis, but only a handful of country-level indexes focus on climate vulnerability without mixing in other categories like pandemics and state fragility.

We selected the Notre Dame Global Adaptation Initiative (ND-GAIN) country index because it has decades of observations and distinguishes between three sub-components of climate vulnerability.[7]

Each country's ND-GAIN vulnerability score is based on its *exposure* to the anticipated physical effects of climate change, *sensitivity* to that level of change, and *adaptive capacity* to address the resulting impacts. Each of these three sub-indexes is composed twelve indicators – two for each

5 Vulnerable Twenty Group, 2024.
6 United Nations, 2024.
7 ND-GAIN, 2024.

of ND-GAIN's six sectors (see Table 1). Exposure covers the environmental impacts of climate change such as the physical change it will experience due to sea level rise. Sensitivity measures the impact that these environmental changes will have on a country. For example, countries for which agriculture accounts for a significant share of employment and output are more sensitive to falling domestic cereal yields than more industrialized countries. Adaptive capacity describes a country's ability to address the impacts of projected environmental changes. For instance, countries with relatively more access to improved sanitation facilities are less vulnerable to projected increases in vector borne diseases due to climate change.

TABLE 1. ND-GAIN indicators

Sector	Exposure Component	Sensitivity Component	Adaptive Capacity Component
Food	Projected change of cereal yields	Food import dependency	Agriculture capacity
	Projected population change	Rural population	Child malnutrition
Water	Projected change of annual runoff	Fresh water withdrawal rate	Access to reliable drinking water
	Projected change of annual groundwater recharge	Water dependency ratio	Dam capacity
Health	Projected change of deaths from climate change induced diseases	Slum population	Medical staffs
	Projected change in vector borne diseases	Dependency on external resources for health services	Access to improved sanitation facilities
Ecosystem services	Projected change of biome distribution	Dependency on natural capital	Protected biomes
	Projected change of marine biodiversity	Ecological footprint	Engagement in international environment conventions
Human habitat	Projected change of warm period	Urban concentration	Quality of trade and transport-related infrastructure
	Projected change of flood hazard	Age dependency ratio	Paved roads
Infrastructure	Projected change of hydropower generation capacity	Dependency on imported energy	Electricity access
	Projected change of sea level rise impacts	Population living under 5m above sea level	Disaster preparedness

Source: ND-GAIN, "Country Index Technical Report."

Our premise is that countries with high exposure and low adaptive capacity need the most external support to adapt to climate change and build resilience.

We chose two of the three ND-GAIN dimensions of vulnerability in structuring our sample of countries: *adaptive capacity and exposure*. Adaptive capacity is a logical focus in assessing the allocation of World Bank adaptation finance because it focuses on areas that the World Bank can directly impact. It mostly captures whether a country has the infrastructure to respond effectively to climate change. World Bank infrastructure finance in the relevant sectors can therefore raise or lower a country's adaptive capacity, and thereby its vulnerability.

We chose exposure as the other dimension of vulnerability that quantifies projected physical changes driven by climate change. These are mostly not subject to World Bank adaptation interventions but rather identify countries' risks from environmental changes affecting land and other natural capital, water availability, heat levels, and food production.

The two can differ greatly, of course. A striking example is the Dominican Republic and Haiti, which share the island of Hispaniola. They have virtually identical ND-GAIN exposure scores (0.447 and 0.441). But the Dominican Republic – with more than six times Haiti's per capita income[8] – has much more adaptive capacity (0.436 compared to 0.272).[9]

We chose not to include the third ND-GAIN dimension—sensitivity—for two reasons. First, including sensitivity did not change the analysis much. The composition of the country groups defined below changed little whether we used exposure scores alone or averaged exposure and sensitivity scores for each country. Moreover, World Bank research (see Figure 1 below) shows that significant shares of populations are at risk (sensitive to climate change) across all country groups. This indicates that, while the sources of sensitivity may vary across countries, climate change is consistently exposing substantial shares of populations across all the countries in the sample.

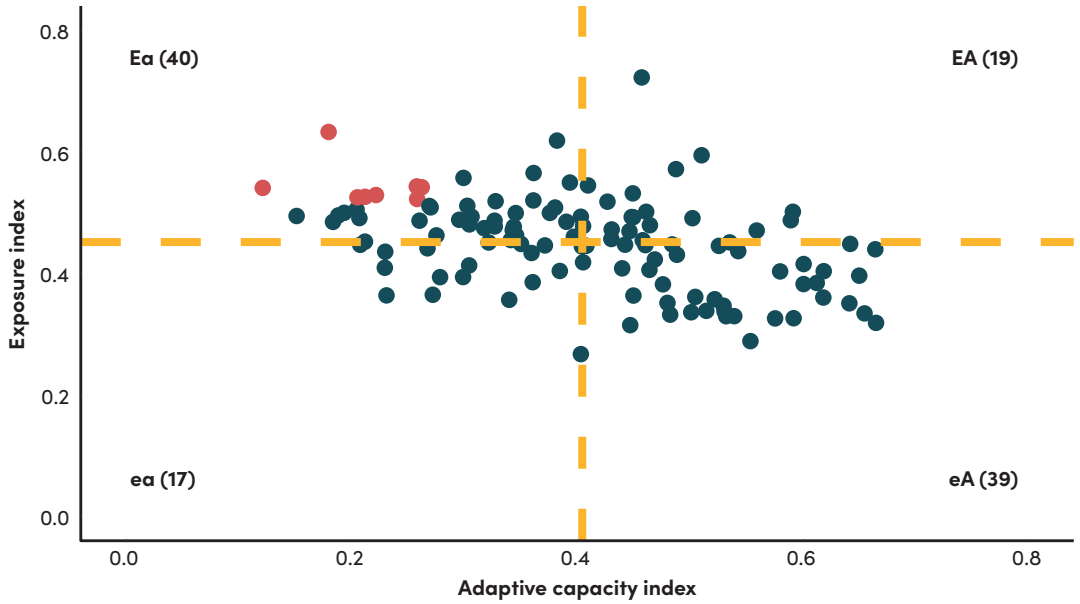
To group countries according to their vulnerability, we started with a sample of 115 countries that have ND-GAIN scores and have received any finance from the World Bank over the period 2014–2023. We grouped them according to whether they were above or below average in terms of exposure and of adaptive capacity. This resulted in four groups as shown in Figure 1:

- High exposure and high adaptive capacity (EA)
- High exposure and low adaptive capacity (Ea)
- Low exposure and high adaptive capacity (eA)
- Low exposure and low adaptive capacity (ea)

8 World Bank Group, 2025c.

9 For ease of interpretation in this paper, we invert ND-GAIN's adaptation scores by subtracting them from one so that a lower score indicates less adaptive capacity.

FIGURE 1. Defining country groups by exposure and adaptive capacity



Note: Dashed lines represent each index's average value for the country sample. Each quadrant represents a sample group: Ea (top left), EA (top right), ea (bottom left), eA (bottom right). The seven most vulnerable countries are highlighted in red.
Source: ND-GAIN.

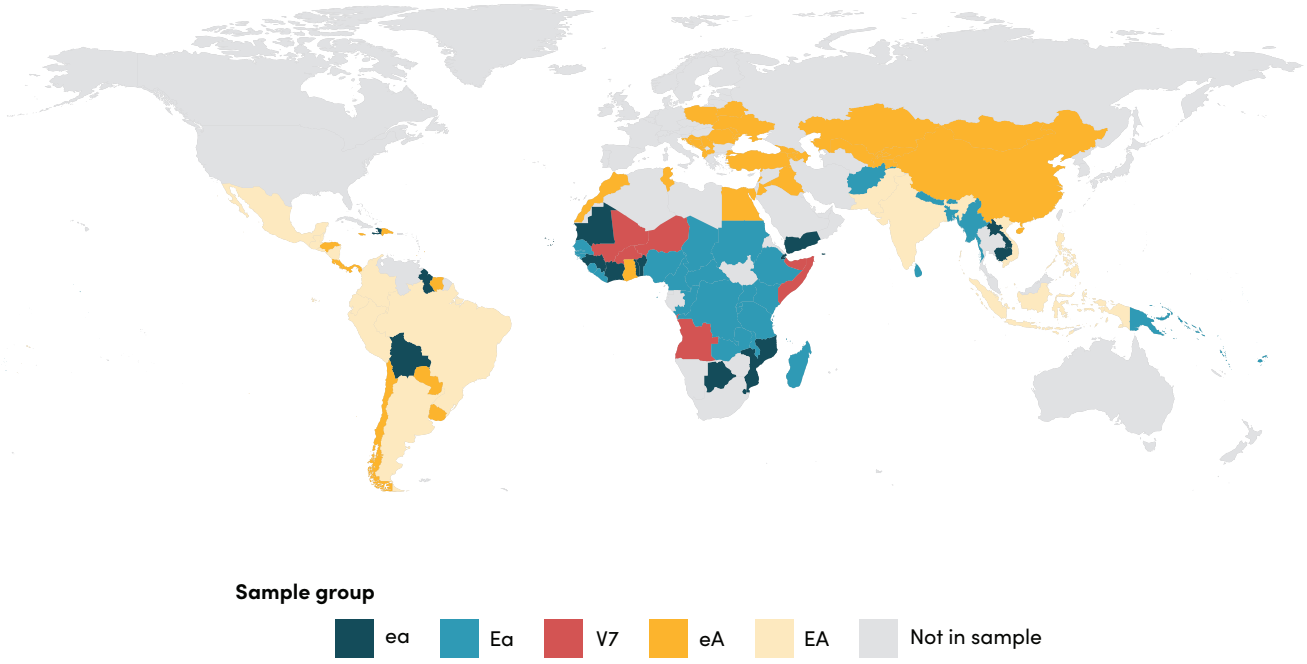
We confirmed that these groups were significantly different from each other for both sub-indexes using mean t-tests (Table 2).

TABLE 2. Mean t-test results for index differences between high and low country groups

Index	Group	Mean	95% Conf. Int.	p-value
Exposure	High (EA & Ea)	0.5087	0.1023–0.1371	0.0000
	Low (eA & ea)	0.3890		
Adaptive capacity	High (EA & eA)	0.5155	0.1935–0.2470	0.0000
	Low (Ea & ea)	0.2952		

Figure 2 illustrates the geographical distribution of the country groups. The highly exposed and low adaptive capacity countries (Ea) are concentrated in sub-Saharan Africa and Asia. Most countries that are highly exposed with high adaptive capacity (EA) are found in Latin America and the Caribbean or emerging markets in Asia (e.g., India and Indonesia).

FIGURE 2. Map of country groups



Note: The seven most vulnerable countries are also members of the Ea group.
Source: ND-GAIN.

The most vulnerable seven (V7)

To define a subset of the most acutely vulnerable countries, we selected the seven countries in our sample that are in the top twenty for exposure and the bottom twenty for adaptive capacity: Angola, Burkina Faso, Burundi, Chad, Mali, Niger, and Somalia. These countries are highlighted in red in Figures 1 and 2. All seven are in sub-Saharan Africa, and six are low-income countries – Angola is lower-middle-income. In the analysis that follows, we will examine the results for this group, the V7, separately from the rest of the Ea countries.

Calculating adaptation finance by country

To examine the World Bank's allocation of adaptation finance by country, we calculated the amount of adaptation finance a country has received from the World Bank between FY2014 and 2023. With no database available for country-level adaptation finance, we had to construct our own country-level data by aggregating adaptation finance for a given country by project using the World Bank's project database.[10] Each project is assigned climate finance shares (total, mitigation, and adaptation) of total project commitments. We extracted project-level adaptation finance from 2,949 projects over this

10 World Bank Group, 2025b.

period and arrived at annual totals for 129 countries. It is not possible to quantify the sectoral shares of project-level adaptation finance: the World Bank reports the share of adaptation finance by project but does not break down that finance share by sector.

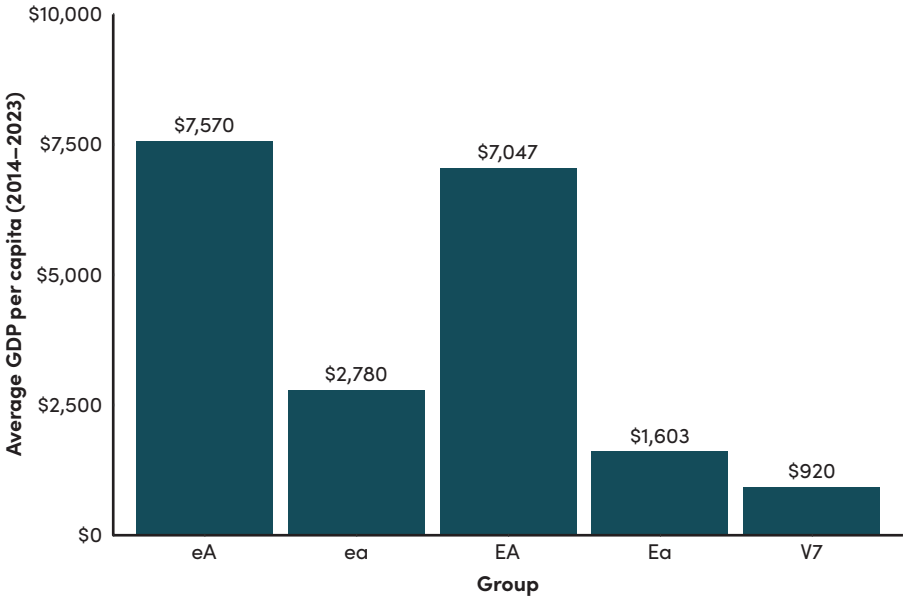
What are the characteristics of the most vulnerable countries?

The data suggest that the most climate vulnerable countries share a number of attributes and confront daunting challenges in other dimensions.

The most vulnerable countries are very poor

First, they tend to be poorer than the rest of the country sample by a large margin. The per capita income of the Ea group (high exposure, low adaptive capacity) is roughly a quarter of that of the EA group. And the per capita income of the EA group is more than eight times that of the 7 most vulnerable countries (V7).

FIGURE 3. Average per capita income by country group

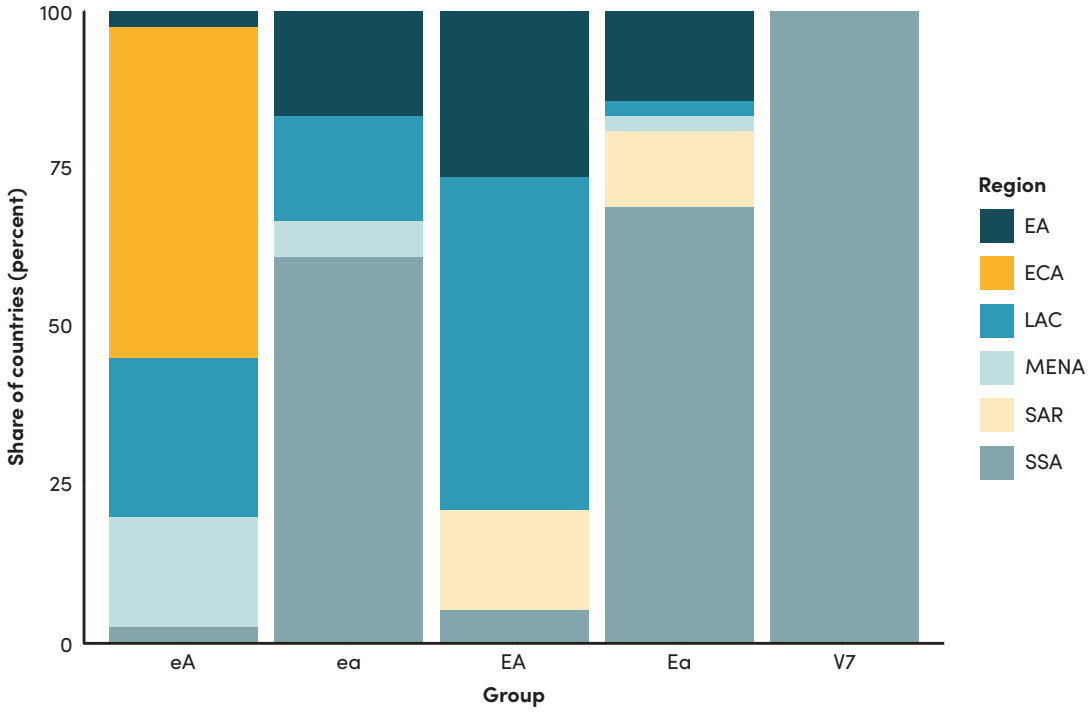


Source: ND-GAIN; World Bank Development Indicators.

They are concentrated in sub-Saharan Africa

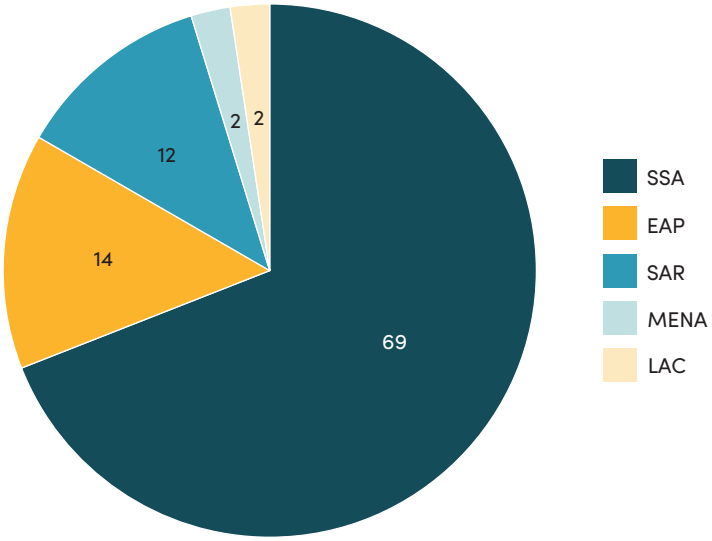
The majority of both the Ea group (70 percent) and the entirety of the V7 are located in sub-Saharan Africa.

FIGURE 4. Regional distribution of country groups



Source: ND-GAIN; World Bank project data.

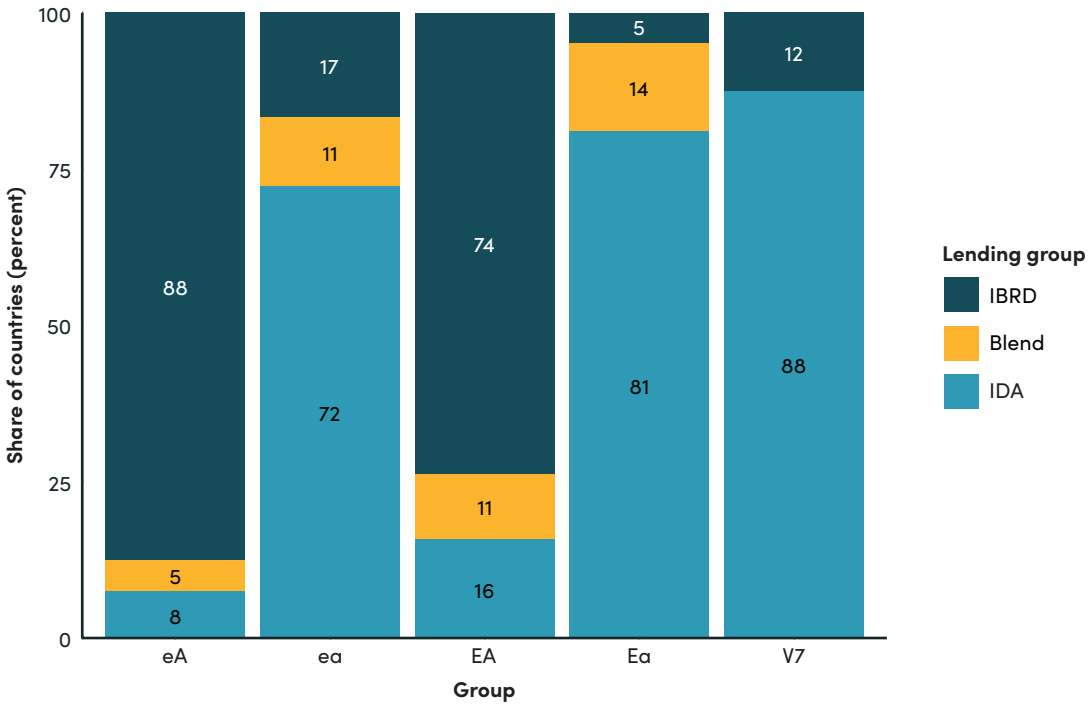
FIGURE 5. Regional distribution of the Ea group



They rely on IDA

Their income levels make most of them eligible for grants and concessional loans from IDA, the World Bank's window for poor countries. By contrast, countries with high adaptive capacity rely mostly on IBRD for World Bank lending.

FIGURE 6. World Bank lending groups by country group



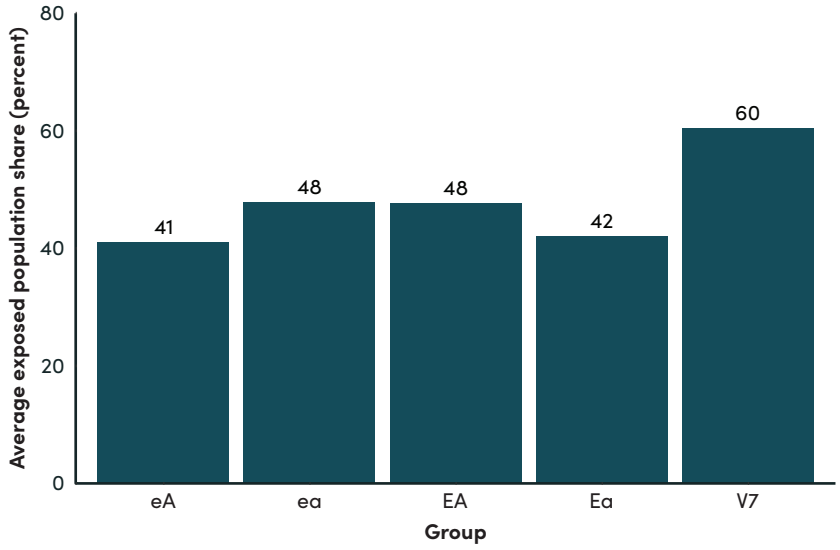
Source: ND-GAIN; World Bank project data.

Significant shares of populations are exposed to climate change across country groups

Recent World Bank research on population shares exposed to climate risk[11] show significant— above 40 percent – shares for all groups of countries. The average exposed share of the population jumps to 60 percent for the V7.

11 Doan et al., 2023 defines exposed population as people at high risk of experiencing extreme weather events (floods, droughts, cyclones, or heatwaves).

FIGURE 7. Average exposed population shares by country group

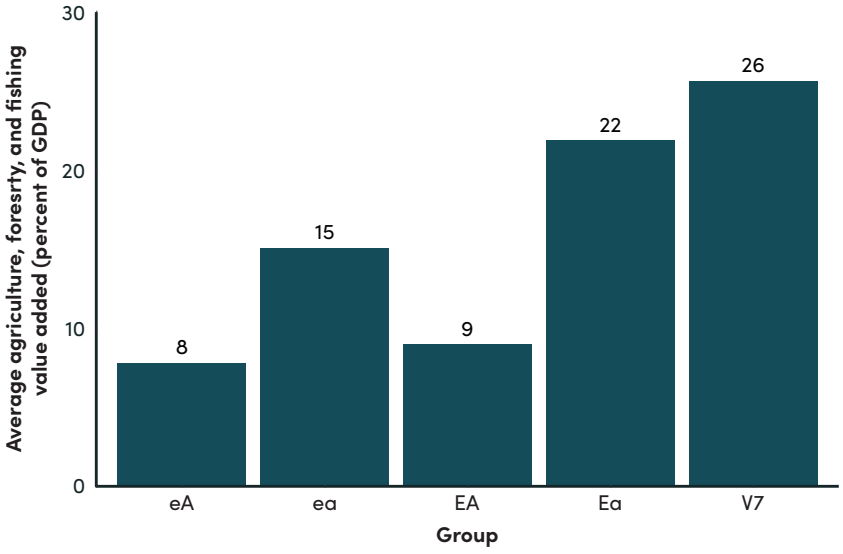


Source: Doan et al., 2023; ND-GAIN.

The most vulnerable countries depend on agriculture, forestry, and fishing

Other indicators help identify the nature of the exposure. For the Ea and V7, agriculture, forestry, and fishing account for more than a fifth of GDP, much higher than the EA group share. This reliance on the natural environment compared to more industrialized countries exacerbates the economic impact of climate change.

FIGURE 8. Dependence on agriculture by country group

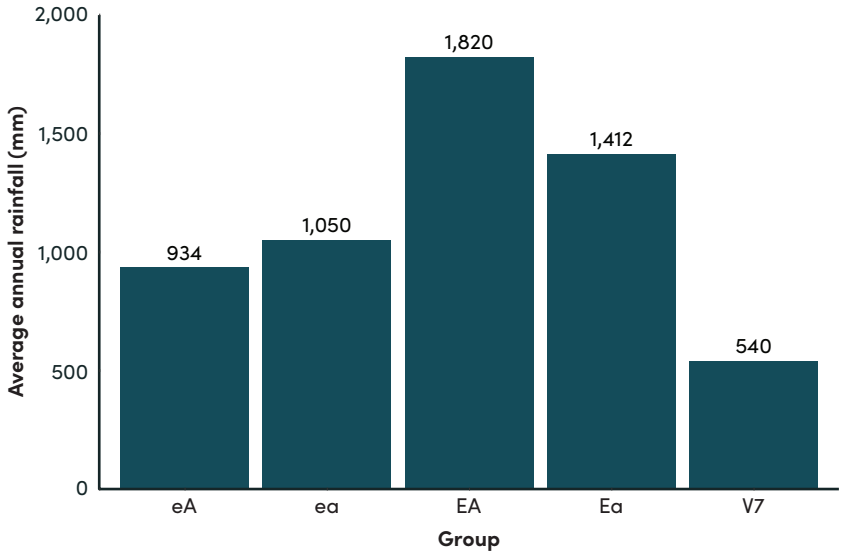


Source: ND-GAIN; World Bank World Development Indicators.

Rainfall varies significantly across country groups

Average annual rainfall by country group shows a more mixed picture.[12] The EA and Ea groups both have relatively high rainfall compared to the low exposure groups. But the V7 group has much lower average annual rainfall – making them even more vulnerable to the increased frequency of droughts.

FIGURE 9. Average annual rainfall by country group



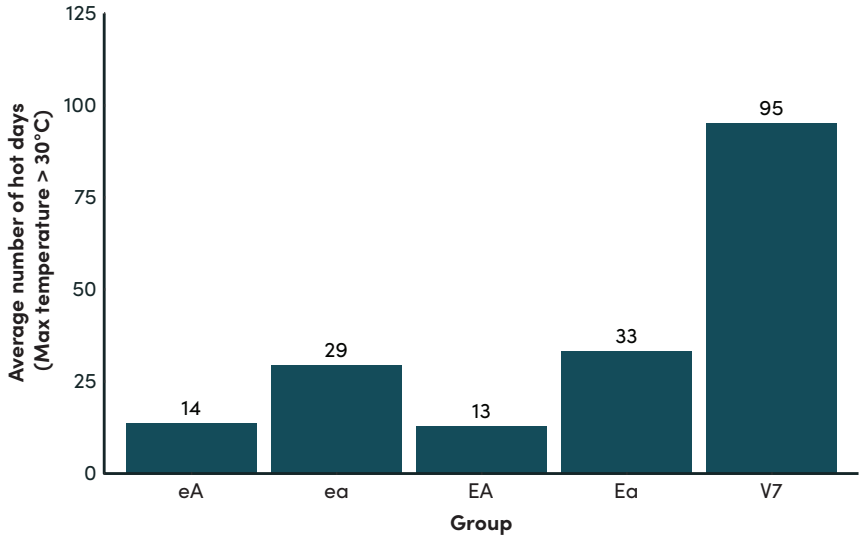
Source: ND-GAIN; World Bank World Development Indicators.

The most vulnerable countries are more exposed to extreme temperatures

Climate change has significantly increased the risk of heat-related mortality.[13] V7 countries have higher mean surface air temperatures than non-V7 countries (27°C compared to 22°C).[14] They are even more exposed to heat risks when we look at the incidence of excessive heat days. Countries in the V7 experience more frequent excessive temperatures than the rest of our sample.

12 Figures 9 and 10 show physical effects already incorporated in the ND-GAIN exposure index.
13 Lüthi et al., 2023.
14 World Bank Group, 2025a.

FIGURE 10. Average number of hot days (maximum temperature > 30°C) in 2022 by country group

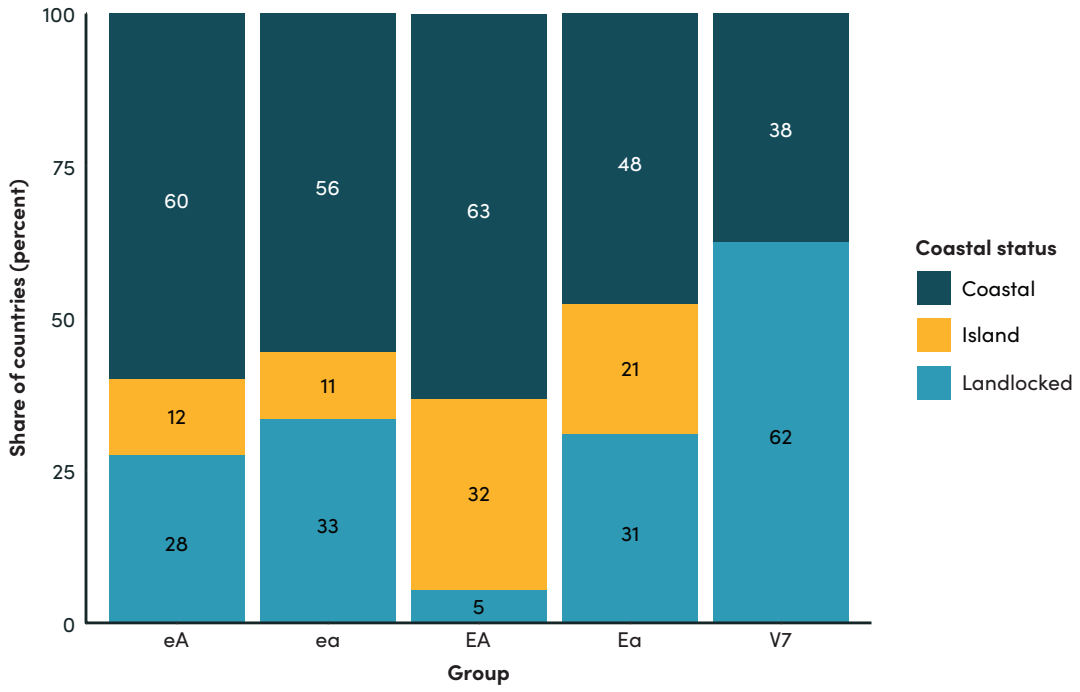


Source: World Bank Climate Change Knowledge Portal, ERA5 Model.

More of the most vulnerable countries are landlocked

The V7 also tends to be geographically landlocked, while the EA group (high exposure, high adaptive capacity) has a high share of island states.

FIGURE 11. Coastal status by country group

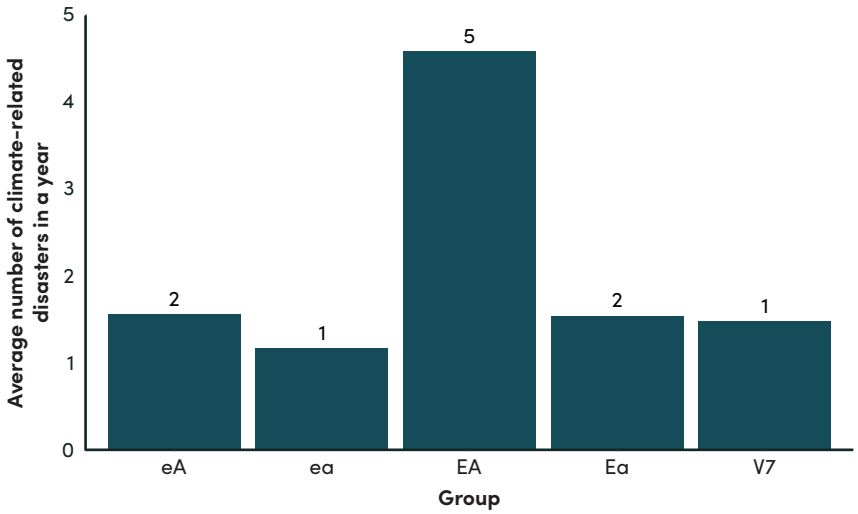


Source: ND-GAIN.

One group stands out for a high incidence of climate-related disasters

The EA group, which has the largest share of small island developing states (SIDS), has a higher incidence of climate-related disasters, including storms and floods.

FIGURE 12. Average annual climate-related disasters by country group



Note: Based on the average number of climate-ralated between 2014 and 2023. Climate-related disasters include droughts, extreme temperature events, floods, landslides, storms, and wildfires.

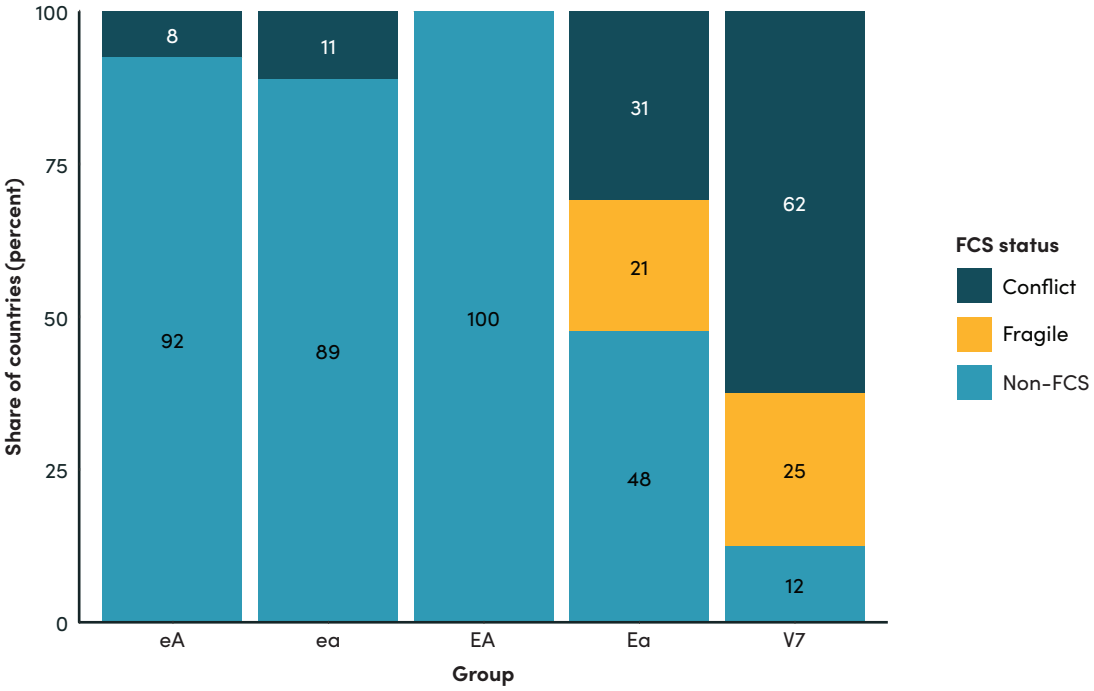
Source: EM-DAT; ND-GAIN.

Interestingly, with that exception, all of the other country groups have roughly the same average number of annual climate-related disasters, demonstrating that countries in different locations with very different physical characteristics are similarly exposed to climate-related disasters.

The most vulnerable countries are more fragile and conflict affected

A critical difference between the Ea and V7 groups and the others is the extent to which they are conflict-affected or fragile.

FIGURE 13. FCS status by country group



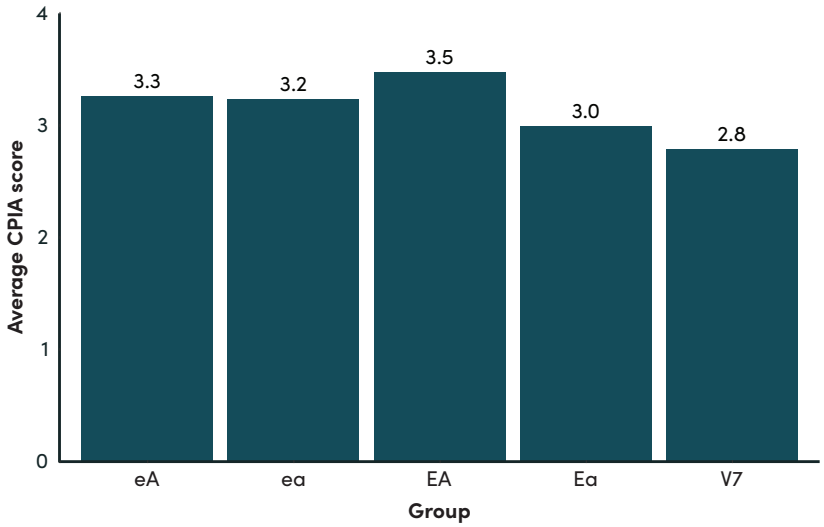
Source: World Bank FY25 FCS Classifications.

More than half the Ea group are conflict-affected or fragile, and near 90 percent of the V7 fall in one of those categories. These challenges obviously reduce their adaptive capacity and likely give rise to a vicious cycle: the negative economic effects of climate change drive more fragility and conflict, which in turn undermine adaptation efforts.

Governance is weaker for the most vulnerable countries

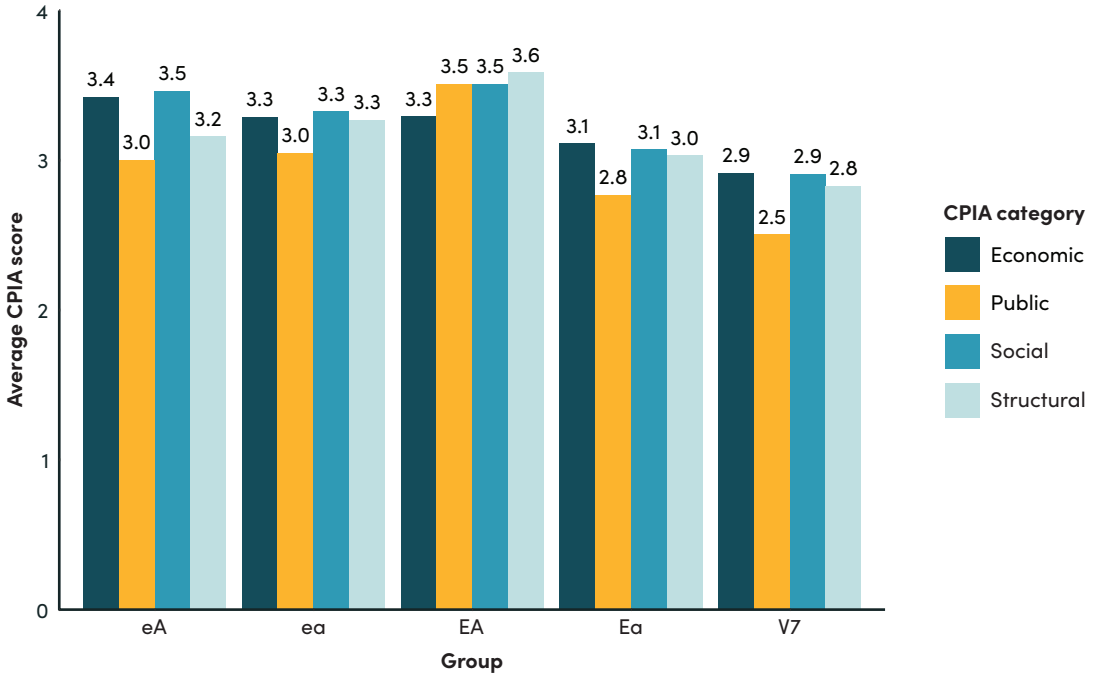
We assessed the governance quality of the different country groups using World Bank Country Policy and Institutional Assessment (CPIA) scores. These assessments are conducted annually for IDA-eligible countries which make up the majority of our sample (57 percent). CPIA scores a country's policies and institutions in terms of economic management, structural policies, policies for social inclusion and equity, and public sector management and institutions. Higher scores indicate stronger policies and institutions.

FIGURE 14. CPIA scores by country group



Note: Averages based on most recent CPIA scores; only IDA-eligible countries are scored.
Source: World Bank World Development Indicators.

FIGURE 15. Disaggregated CPIA scores by country group



Note: Averages based on most recent CPIA scores; only IDA-eligible countries are scored.
Source: World Bank World Development Indicators.

The Ea group and V7 have the lowest average CPIA scores, especially in comparison to the EA group.[15]

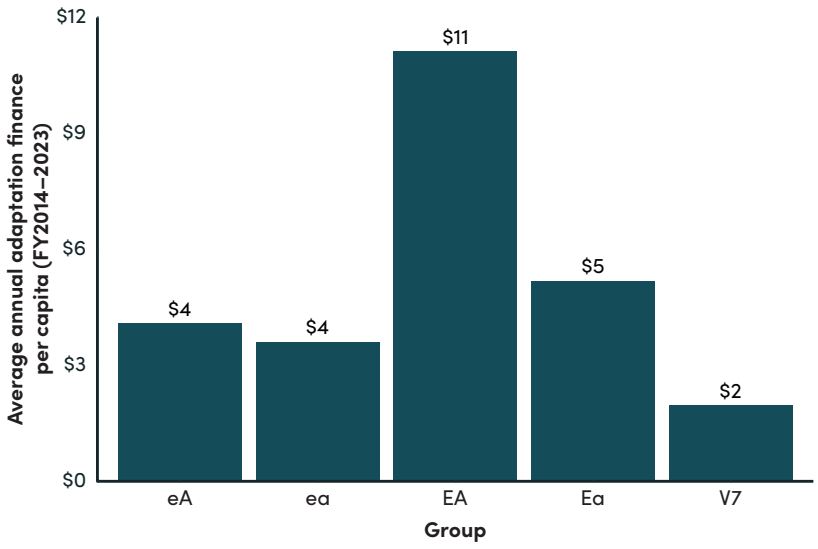
Do more vulnerable countries receive more World Bank adaptation finance?

Finding the right metrics for comparing flows across country groups is critical. Absolute adaptation finance flows do not take into account country size. Therefore, the comparisons below adjust for the size of population, GDP, and land mass. We also compare World Bank adaptation finance to total World Bank commitments for each country group.

The most vulnerable countries receive much less finance per capita than countries with higher adaptive capacity

On a per capita basis, World Bank adaptation finance seems to be driven mostly by a combination of high exposure and high adaptive capacity. Ea countries received less than half the per capita adaptation finance than EA countries. And the V7 are particularly disadvantaged, receiving less than a fifth of what the EA countries received.

FIGURE 16. World Bank adaptation finance per capita by country group (FY2014–2023)

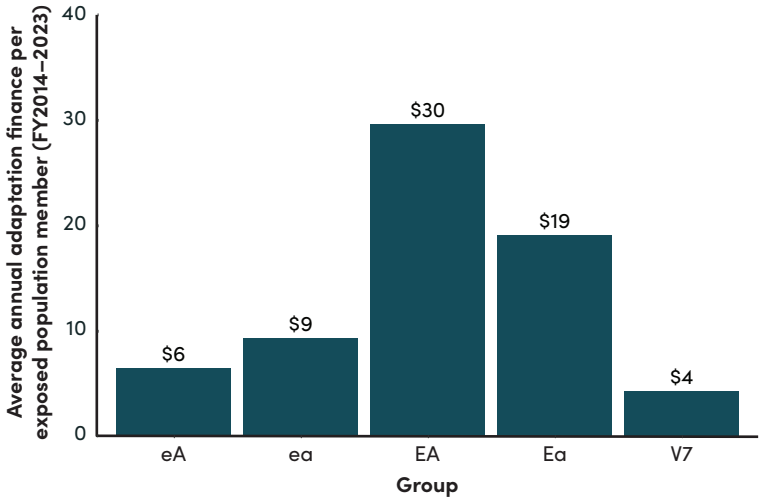


Source: ND-GAIN; World Bank World Development Indicators.

The same pattern is evident when calculating World Bank adaptation finance per capita for exposed populations.

15 The CPIA scores correspond broadly to another set of ND-GAIN indicators that measure "readiness", as distinct from vulnerability. Readiness scores assess the business environment, institutional capacity, and social inequality.

FIGURE 17. World Bank adaptation finance per exposed population member by country group (FY2014–2023)

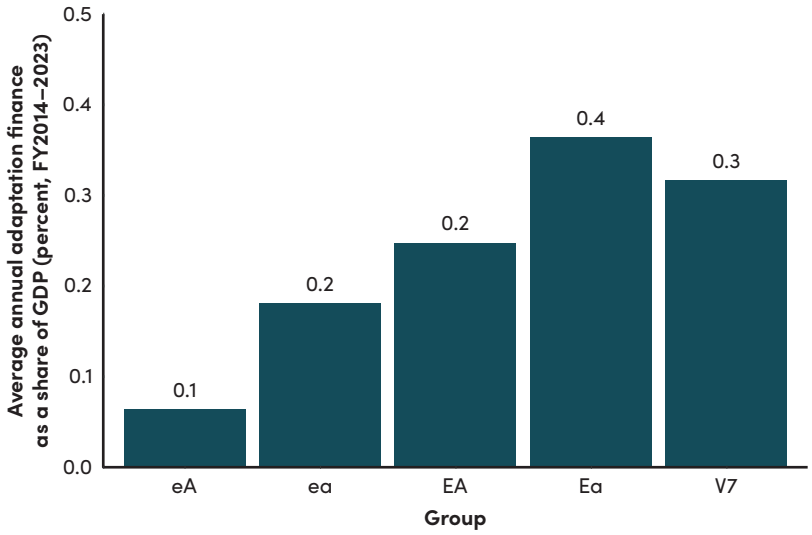


Source: Doan et al., 2023; ND-GAIN; World Bank project data.

Limited World Bank role in filling adaptation finance gaps for the most vulnerable countries

Figure 18 showing average annual World Bank adaptation finance shares of GDP unsurprisingly indicates that the ratio is higher for Ea countries and the V7: they are poorer and have smaller GDPs than other country groups. But because adaptation needs vary across country income groups, the higher shares of GDP do not necessarily mean that the World Bank plays a major role in helping these countries meet their finance gaps.

FIGURE 18. World Bank adaptation finance as a share of GDP by country group (FY2014-2023)



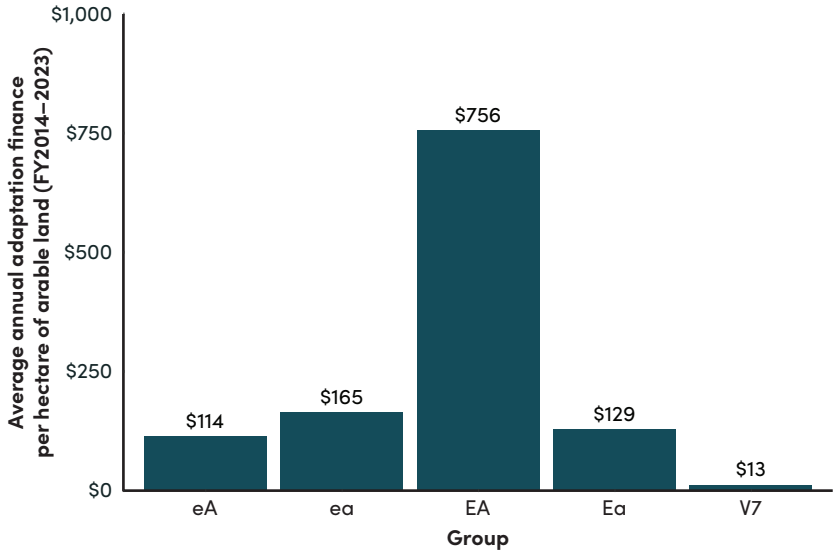
Source: ND-GAIN; World Bank World Development Indicators.

The UNEP Adaptation Gap Reports for 2023 and 2024 estimate that adaptation costs are higher for lower-income countries—2 to 3.5 percent of GDP for the poorest countries,[16] vs. 1.4 percent for other developing countries.[17] World Bank average annual adaptation finance of 0.4 percent of GDP for Ea countries and 0.3 percent for the V7 therefore suggests the Bank contributes only a little more than a tenth of the projected finance needs of these countries.

Low finance intensity relative to arable land mass for the most vulnerable

The comparison of adaptation finance per acre of arable land across country groups shows a low ratio for Ea countries compared to EA countries and a very low ratio for the V7.

FIGURE 19. World Bank adaptation finance per hectare of arable land by country group (FY2014–2023)



Source: ND-GAIN; World Bank World Development Indicators.

However, this relationship is mostly driven by differences in the share of SIDS in each country group. SIDS receive large amounts of adaptation finance relative to their size, and the EA group has relatively more SIDS than other groups.

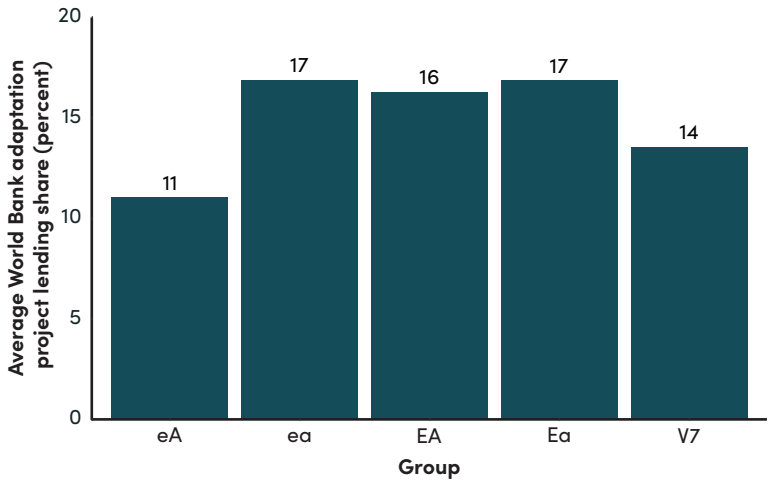
16 Least developed countries (LDCs) are defined by the UN based on per-capita income, human assets index, and economic and environmental vulnerability index thresholds. The per-capita income limit is similar to that used by the World Bank Group to define LICs.

17 UNEP, 2023; UNEP, 2024.

Adaptation share of World Bank finance is mostly similar across country groups

Adaptation finance shares of total World Bank finance commitments, at 16–17 percent, are similar across country groups, except for those at both ends of the spectrum—low exposure, high adaptive capacity (eA) and the V7.

FIGURE 20. Adaptation shares of annual World Bank commitments by country group (FY2014–2023)



Note: Adaptation shares were calculated by dividing a country's adaptation finance by total commitments under World Bank project.

Source: ND-GAIN; World Bank project data.

For the V7, the lower share could easily be driven by other country priorities. Adaptation investments could be partially crowded out by other urgent needs for countries that are fragile or in conflict, extremely poor, and confronting a wide range of policy and governance challenges. For these countries, the sheer breadth and scale of needs suggest that shortfalls in adaptation finance cannot be solved without increasing overall finance levels.

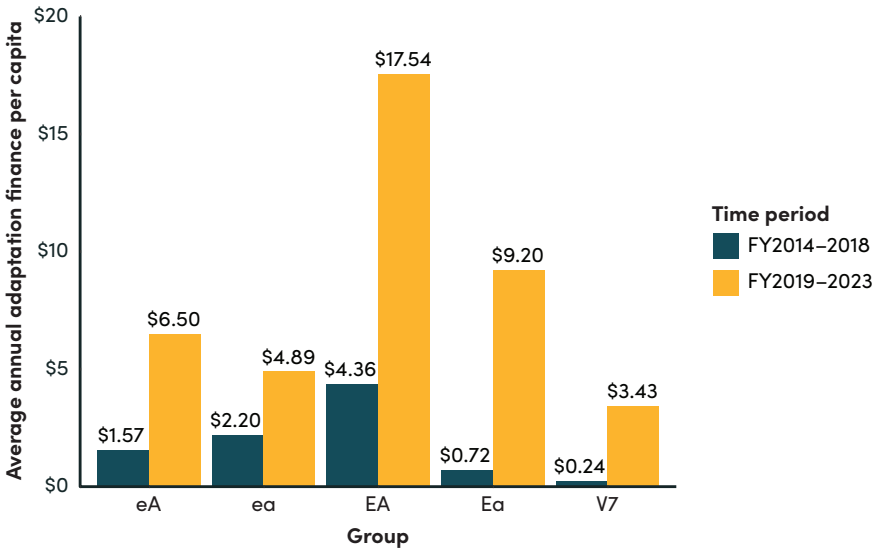
Is the World Bank's adaptation finance intensity growing over time?

Over the ten-year sample period, climate risks and damage increased significantly, and countries' focus on the importance of adaptation investment also increased. It makes sense therefore to look at changes in World Bank adaptation finance intensity to see whether we observe upward trends. We therefore divided the sample period in half and compared 2014–2018 to 2019–2023.

Sharp increase in adaptation finance intensity

In fact, the data show marked increases in per capita adaptation finance for all country groups, but especially groups with higher exposure.

FIGURE 21. World Bank adaptation finance per capita by country group over time (FY2014–2023)

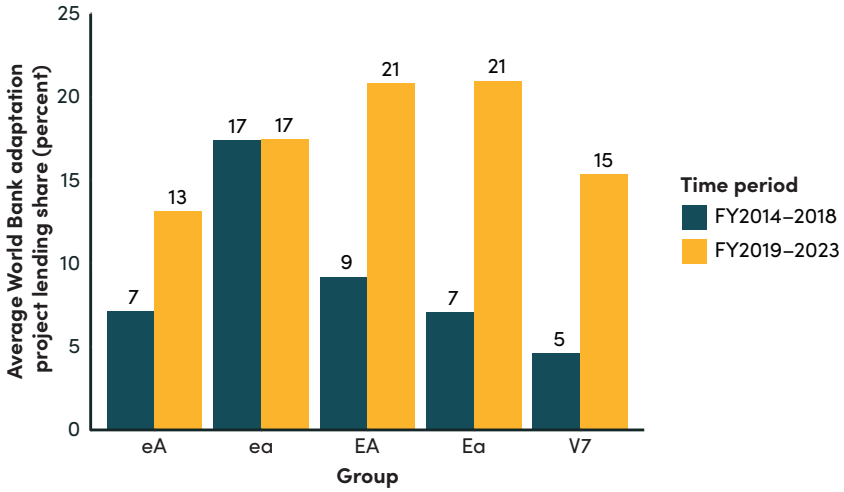


Source: ND-GAIN; World Bank project data.

The largest change was the fourteen-fold increase for the V7 and the thirteen-fold increase for the Ea group, though from extremely low levels. The four-fold increase for the EA group, which had the highest ratio in the initial period, was also notable.

We can also see a notable uptick in the adaptation finance share of overall World Bank commitments across all but one of the country groups.

FIGURE 22. Adaptation shares of annual World Bank commitments by country group over time (FY2014–2023)



Note: Adaptation shares were calculated by dividing a country's adaptation finance by total commitments under World Bank project.

Source: ND-GAIN; World Bank project data.

Those increases were greatest for the Ea and V7 groups, bringing the Ea adaptation finance share to the same 21 percent level as the EA group and the V7 share to 15 percent. We don't know exactly what country demand and World Bank supply factors drove those increases, but it does show growing World Bank's ability to boost adaptation engagement in countries with both high exposure and limited adaptive infrastructure.

What kinds of adaptation activities does the World Bank undertake in the seven most vulnerable countries?

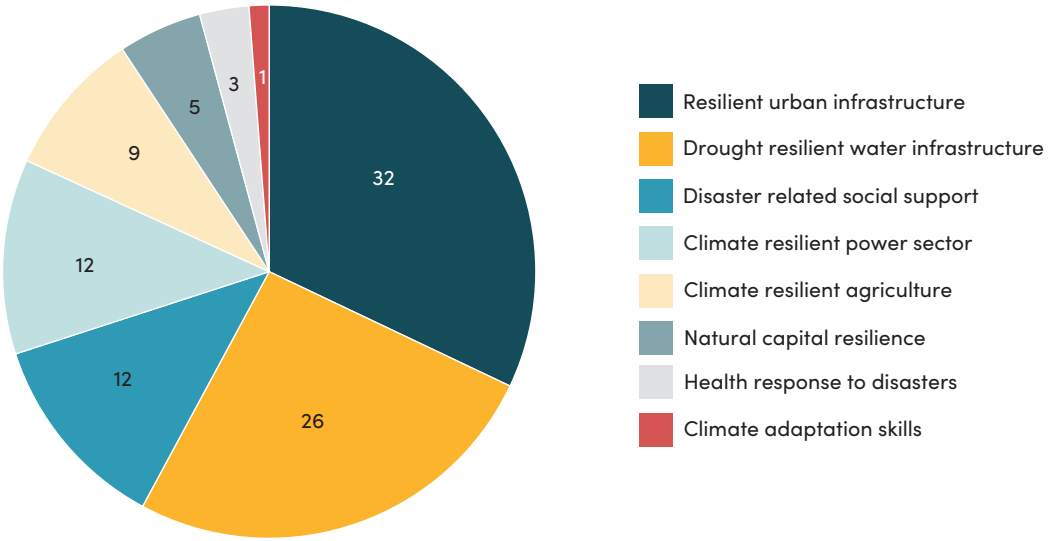
As noted above, the World Bank does not publish adaptation finance data at the country level broken down by sector. So, to answer this question, we examined data for a sample of 31 World Bank projects in the V7: projects in the years 2022 and 2023 which had at least 10 percent of their funding tagged as adaptation finance. We looked at all of the activities within each project and, based on the nature of these activities, designated the adaptation funding portion of each project to one of eight adaptation-related sectoral activities. We created the sector designations ourselves to allocate funding to activities that were clearly adaptation-related and to avoid double counting. The sectors are as follows:

- **Resilient Urban Infrastructure:** Includes projects focused on enhancing the resilience of urban areas to climate impacts. Activities may include improving drainage in a city to improve flooding resilience and building climate resilient roads.
- **Drought Resilient Water Infrastructure:** Projects in this sector aim to improve water supply systems to better withstand drought conditions. Includes building water supply points, increasing and improving household water piping systems, and building additional water storage.
- **Disaster-Related Social Support:** This sector covers projects aimed at providing social safety nets and support services to vulnerable populations. An example is quick cash transfer in response to climate disasters.
- **Climate Resilient Power Sector:** Projects in this sector define climate resilience by building the energy sector, including electrification or improving electrical systems.
- **Climate Resilient Agriculture:** This includes projects that aim to enhance the resilience of agricultural systems. Activities encompass all farming and cattle related practices including increasing capacity of smallholder farmers, strengthening animal husbandry systems, and improving access to farming technologies.
- **Natural Capital Resilience:** This sector includes projects focused on protecting and restoring ecosystems as a means of enhancing climate adaptation. Activities include addressing deforestation and other climate resilient landscape practices.

- **Health Response to Disasters:** Projects in this sector aim to increase the resilience of any health-related systems, such as strengthening healthcare infrastructure and developing better emergency preparedness.
- **Climate Adaptation Skills:** The projects in this sector focus on building knowledge related to climate adaptation. Activities may include providing education on what climate adaptation is and providing teachers with climate adaptation knowledge.

Figure 23 illustrates the share of adaptation funding by sector. It indicates that more than half of the finance goes to resilient infrastructure. One surprise is the relatively small share of finance for climate resilient agriculture, given the dependence of these economies on the agricultural sector (see Figure 8).

FIGURE 23. Adaptation finance by sector for V7 project sample (percent)



Note: Based on a sample of 31 World Bank projects in Angola, Burkina Faso, Burundi, Chad, Mali, Niger, and Somalia approved between FY2022–2023.

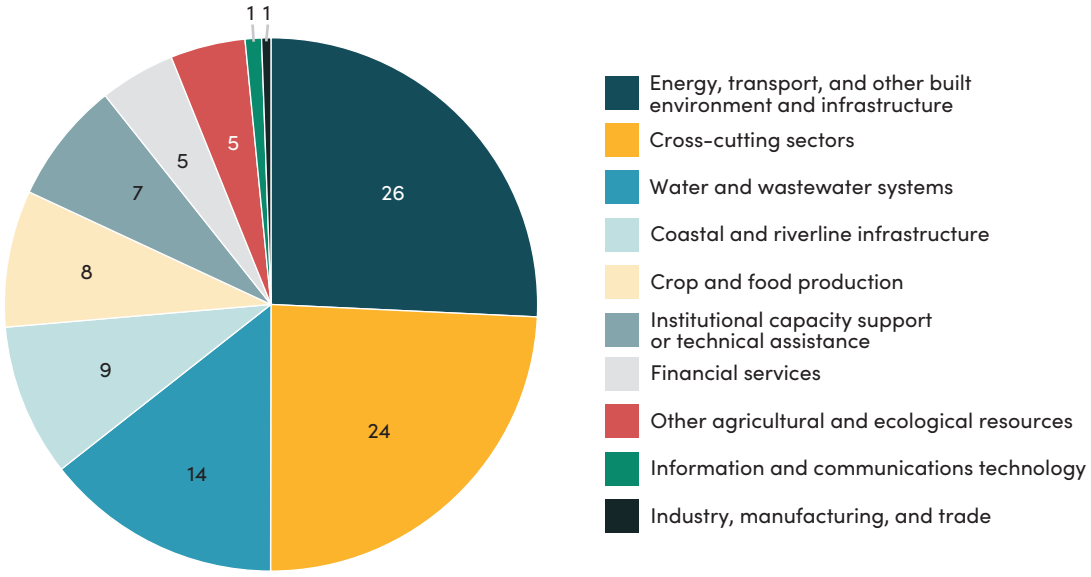
Source: World Bank project data.

To get a sense of whether the World Bank undertakes the same or different adaptation activities in the most vulnerable countries than in all LICs and MICs, we can compare the sectoral distribution in Figure 23 to that in Figure 24 which shows the sectoral breakdown for adaptation finance in all LICs and MICs from the 2023 MDB joint report on climate finance.

Although the categories used in the joint report differ from our typology for the V7 projects, we see broad similarities.[18] As was the case in our sample, infrastructure is the largest category and adaptation finance for crop and food production accounts for less than 10 percent.

18 We developed our own sectoral categories because the World Bank and joint MDB report define category names that are not fully distinct from each other. Had we used their categories without access to the criteria needed to make distinctions between adaptation activities, we would have risked improperly assigning funding across sectors and double counting.

FIGURE 24. MDB adaptation finance to low- and middle-income countries by sector (percent)



Source: 2023 Joint Report on Multilateral Development Banks' Climate Finance.

Summary

This paper explores whether the World Bank prioritizes climate vulnerability at the country level in allocating adaptation finance. It constructs a sample of 115 countries that received finance from the World Bank over 2014–2023, groups them according to their vulnerability as measured by climate exposure and adaptive capacity, and assesses whether the Bank directs more adaptation finance to the most vulnerable.

Five country groups are defined: low exposure/low adaptive capacity (ea), low exposure/high capacity (eA), high exposure/high capacity (EA), high exposure/low capacity (Ea), and the most vulnerable seven (V7)—the seven countries in the world with the highest exposure and lowest adaptive capacity.

We find that the Ea and V7 countries have received much less climate adaptation finance per capita and as a share of arable land over the whole period than EA countries. The V7 receive only $2 per capita in average annual adaptation finance as compared to $11 dollars for EA countries, and $5 per capita for Ea countries. EA countries receive an average annual $756 of adaptation finance per acre of arable land, compared to $129 for Ea countries, and a mere $13 for the V7.

But we also find a marked evolution over the ten-year period. The World Bank's adaptation finance intensity is rising very rapidly for the most vulnerable countries. They have received the largest increases in World Bank adaptation finance per capita and in the adaptation share of overall World Bank finance commitments. Adaptation finance per capita surged by factors of 13 and 14 for Ea

countries and the V7 respectively from the first to the second five years of the period. The adaptation finance share of total World Bank commitments tripled for both Ea countries and the V7.

If we look at World Bank adaptation finance as a share of GDP across the country groups, we find that the Ea and V7 groups have the largest adaptation finance shares at 0.4 and 0.3 percent of GDP respectively for the whole period. But these shares are dwarfed by adaptation needs, estimated by the UN at about 3 percent of GDP annually for the poorest countries. World Bank finance therefore accounts for a little more than a tenth of annual needs for countries that have minimal access to alternative sources of finance.

These countries are also weighed down by an array of other challenges: they are among the poorest in the world; they tend to be fragile and conflict-affected; they are agriculture-dependent—a hard sector around which to build a robust growth strategy; and their governance capacity is weak. The V7 subset has a particularly high share of their populations exposed to climate risk: they have lower rainfall levels than the other country groups, experience excessive heat far more frequently, and more of them are landlocked.

A scarcity of data at the country level limited our ability to examine what activities and sectors were funded by the World Bank finance. But a sample of V7 projects revealed that much of the finance was used for climate-resilient infrastructure, as might be expected. A surprise was the relatively small share deployed for supporting climate-resilient agriculture in countries that tend to be agriculture-dependent—a finding that highlights the importance of more World Bank support for climate-resilient agricultural production techniques, products, and distribution systems.[19]

Efforts to build a more resilient agrifood system face large financing and innovation gaps. CPI and the United Nations Food and Agriculture Organization estimate that financing for global agrifood systems will have to increase at least forty times current levels to meet Paris Agreement mitigation and adaptation targets.[20] This includes billions in additional annual funding to deploy more resilient crop and livestock systems. Developing new technologies and approaches for climate-smart agriculture will require significant investment. The most vulnerable countries have limited capacity to fund R&D for agriculture on their own, and external flows are insufficient: only one percent of adaptation finance to Africa funds agricultural research.[21]

What research is funded has limited transmission to smallholder farmers, who produce most of Africa's food supply. Newly developed climate-resilient crop varieties often show low adoption rates in sub-Saharan Africa.[22] Uptake of climate-smart agricultural innovations has been limited among

19 Glennerster et al., 2024.
20 CPI & FAO, 2024.
21 Tenkouano et al., 2023.
22 Glennerster et al., 2024.

smallholders because of financing and knowledge barriers.[23] Underuse of rainwater harvesting techniques, for example, puts farmers at risk in the water-starved Sahel.[24] Therefore, in addition to investing directly in R&D, adaptation finance is needed to upscale the use of climate-smart innovations in vulnerable farming communities.

Four policy implications

The first is the critical need for expanding IDA as an essential source of more adaptation finance for the most vulnerable countries, nearly all of which are IDA-eligible. While the World Bank's adaptation finance intensity for these countries is rising, the levels remain far below what is needed to supplement their limited fiscal capacity to invest in adaptation and resilience, as well as in their broader development priorities.

The second implication follows from the daunting, multi-dimensional nature of challenges facing the most climate vulnerable countries, especially those also affected by fragility, conflict, and violence (FCV). This evidence suggests that climate vulnerability should play a central role as the World Bank formulates its new FCV strategy. The strategy should be grounded in comprehensive evidence and learning about the interaction between climate vulnerability and fragility. A distinct approach to diagnostics, including in the Country Climate and Development Reports (CCDRs), seems warranted for such countries. The aim should be to advance a sequence of World Bank interventions that is both realistic and effective when a country is beset by existential risks that are reinforcing each other. As an example, traditional World Bank priorities for institution building may not be as relevant in countries where boosting declining agricultural productivity is the central challenge for livelihoods, social and political stability, and reducing conflict.

Moreover, an increase in the overall IDA envelope will not necessarily reach these countries under IDA's performance-based allocation (PBA) system, where CPIA scores play a key role. IDA already has a special envelope for FCV countries and eased PBA eligibility criteria. We propose a further change to help boost access to finance: countries that are classified as both FCV countries and as highly climate vulnerable should receive a "top-up" in their PBA allocations. The World Bank could develop a classification system to identify highly vulnerable, IDA eligible countries similar to the approach outlined here.

The third implication is that the World Bank will have to invest an exceptional amount of grant finance in these countries in upstream activities to build productive adaptation projects in infrastructure and agriculture. The comparison between finance levels for EA countries vs. Ea countries is telling. The good news is that these grants can help build a virtuous circle. Closing the capacity gap would: reduce climate vulnerability; open up opportunities for greater

23 Ogunyiola et al., 2022.
24 Innovation Commission, 2023.

World Bank adaptation finance intensity, which would further reduce vulnerability; and, more broadly, help drive sustainable development. These grants can be sourced from the existing climate finance architecture; there is no need to create yet another climate fund. Donors have committed a cumulative $69 billion to the climate-related financial intermediary funds (FIFs),[25] for example, which offer concessional finance for both mitigation and adaptation. The challenge is to direct more of the adaptation finance in those funds to developing strong projects in the most vulnerable countries.

Finally, the data about the characteristics of the most vulnerable countries and about the sectoral allocation of World Bank finance suggest a clear need to increase support for climate-resilient agriculture. More research is needed to understand its current relatively small share of finance. But the systemic importance of the sector in the most vulnerable countries is undeniable. Climate change is making the status quo increasingly untenable, driving food insecurity, migration, and conflict. Increased World Bank support for productive investment in this sector in these countries – especially in helping smallholder farmers take up new products and techniques – would yield high economic, social, and security returns.

25 Lee, Landers, and Matthews, 2023.

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Appendix 1: Country groups

Ea: High Exposure and Low Adaptive Capacity		EA: High Exposure and High Adaptive Capacity		eA: Low Exposure and High Adaptive Capacity		ea: Low Exposure and Low Adaptive Capacity	
Country	**Region**	**Country**	**Region**	**Country**	**Region**	**Country**	**Region**
Afghanistan	SA	Argentina	LAC	Albania	ECA	Benin	SSA
Angola	SSA	Belize	LAC	Armenia	ECA	Bolivia	LAC
Bangladesh	SA	Brazil	LAC	Azerbaijan	ECA	Botswana	SSA
Bhutan	SA	Colombia	LAC	Barbados	LAC	Cabo Verde	SSA
Burkina Faso	SSA	Ecuador	LAC	Belarus	ECA	Cambodia	EAP
Burundi	SSA	El Salvador	LAC	Bosnia and Herzegovina	ECA	Cote d'Ivoire	SSA
Cameroon	SSA	Guatemala	LAC	Chile	LAC	Djibouti	MENA
Central African Republic	SSA	India	SA	China	EAP	Eswatini	SSA
Chad	SSA	Indonesia	EAP	Costa Rica	LAC	Guinea	SSA
Comoros	SSA	Maldives	SA	Croatia	ECA	Guyana	LAC
Congo, Democratic Republic of	SSA	Mexico	LAC	Dominican Republic	LAC	Haiti	LAC
Congo, Rep.	SSA	Nicaragua	LAC	Egypt	MENA	Laos PDR	EAP
Ethiopia	SSA	Pakistan	SA	Georgia	ECA	Lesotho	SSA
Fiji	EAP	Peru	LAC	Ghana	SSA	Mauritania	SSA
The Gambia	SSA	Philippines	EAP	Grenada	LAC	Mozambique	SSA
Guinea-Bissau	SSA	Samoa	EAP	Honduras	LAC	Togo	SSA
Kenya	SSA	Seychelles	SSA	Iraq	MENA	Yemen	MENA
Kiribati	EAP	Tonga	EAP	Jamaica	LAC		
Liberia	SSA	Viet Nam	EAP	Jordan	MENA		
Madagascar	SSA			Kazakhstan	ECA		
Malawi	SSA			Kyrgyz Republic	ECA		
Mali	SSA			Lebanon	MENA		
Myanmar	EAP			Moldova	ECA		
Nepal	SA			Mongolia	EAP		
Niger	SSA			Montenegro	ECA		

(Continued)

Ea: High Exposure and Low Adaptive Capacity		EA: High Exposure and High Adaptive Capacity		eA: Low Exposure and High Adaptive Capacity		ea: Low Exposure and Low Adaptive Capacity	
Country	**Region**	**Country**	**Region**	**Country**	**Region**	**Country**	**Region**
Nigeria	SSA			Morocco	MENA		
Papua New Guinea	EAP			North Macedonia	ECA		
Rwanda	SSA			Panama	LAC		
Sao Tome and Principe	SSA			Paraguay	LAC		
Senegal	SSA			Poland	ECA		
Sierra Leone	SSA			Romania	ECA		
Solomon Islands	EAP			Serbia	ECA		
Somalia	SSA			Suriname	LAC		
Sri Lanka	SA			Tajikistan	ECA		
Sudan	SSA			Tunisia	MENA		
Tanzania	SSA			Turkiye	ECA		
Tuvalu	EAP			Ukraine	ECA		
Uganda	SSA			Uruguay	LAC		
Vanuatu	EAP			Uzbekistan	ECA		
Zambia	SSA						

Note: The following abbreviations were used: East Asia and the Pacific (EAP), Europe and Central Asia (ECA), Latin America and the Caribbean (LAC), the Middle East and North Africa (MENA), South Asia (SA), and sub-Saharan Africa (SSA). Countries in the V7 are **bold**.