



The Original SinS*: the intertwined climate and financial challenges of developing countries

**Climate and financial vulnerabilities of developing countries – and their solutions – lie mostly in factors outside their control*

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Executive summary

Developing countries are the hardest hit relatively by climate change. This is because adverse climate-related impacts tend to be concentrated in tropical regions, and because developing countries have fewer resources than developed countries to cope with the economic and social fallouts from climate-related physical impacts. This is despite their low historical contribution to global greenhouse gas emissions.

Developing countries also face a structural financial and macroeconomic constraint. One of the main reasons for this constraint is that incomplete financial markets impede developing countries (their governments and residents) from borrowing abroad in their currency. Therefore, a significant share of their debt is therefore denominated in foreign currency, which exposes them to currency mismatch (debt is denominated in foreign currency while assets or government revenue are in domestic currency). When economic conditions worsen, the exchange rate usually depreciates, which leads to higher debt service in local currency terms. This has been coined an “**original sin**” in economic literature, because the reasons for such an inability to borrow abroad in domestic currency lie in factors outside the control of developing countries.

We contend that developing countries’ climate and financial vulnerabilities can be deemed as “**original sinS**”: they have immense negative consequences for their development and stability, but the root causes originate primarily from variables independent of their actions and management.

Lack of adaptation to climate change and the financial vulnerability of developing countries strengthen each other. The destabilizing impact of climate change exacerbates the financial vulnerability of these countries. Reducing the destabilization potential of climate change in these countries requires substantial adaptation investments, which are hampered by their difficult access to financing. Therefore, the case for bringing together the international agendas for addressing climate vulnerability and financial challenges of developing countries appears strong, and strengthens as climate change accelerates.

This policy brief provides four arguments for actively intertwining these agendas. The combination of strong financial vulnerability of developing countries, as shown by the looming debt crisis at the time of writing this policy brief (argument 1); the negative impact of climate change on gross domestic product (argument 2); and high adaptation investment needs (argument 3) makes the financial outlook of developing countries quite preoccupying. Acknowledging that developed countries have a pent-up climate liability owed to developing countries (argument 4) can provide the moral basis for the former to provide debt relief to the latter in the form of adaptation-linked debt relief programmes (ALDRPs).

ALDRPs allow to link the agendas for addressing climate vulnerability and financial challenges of developing countries together. Such tools tie debt relief of a debtor developing country to adaptation investments, and therefore concurrently address its climate and financial vulnerabilities. Such tools still need to be standardized, which severely hampers their deployment. This policy brief provides guidance regarding the most important

dimensions to consider when looking at implementing ALDRPs, in an attempt to ease and accelerate their rollout. These dimensions are:

- The identification of the most relevant countries for implementing ALDRPs: critical features for identifying countries most relevant to ALDRPs lie in their level of debt distress, their (lack of) resilience to climate change, the quality of the country's adaptation planning, and the strength of its governance and public management.
- The type of debt to leverage for ALDRPs: the most important asset classes candidates for ALDRPs are Paris club debt and privately-owned bonds. The former is more relevant to tackle when debt is poorly risky, while the latter can be focused on when a country is at a relatively high risk of debt distress.
- The way to use the proceeds of ALDRPs: ALDRPs should foster country ownership over its adaptation strategy and operational implementation. Projects financed should maximize the impact on the macro-fiscal resilience of the country, and should be non-bankable or near-bankable projects. In the latter case, blended finance schemes should be considered. Official Development Assistance, Non-Government Organisations or philanthropies interventions can support the rollout of adaptation projects financed through ALDRPs. Transparency over the use of proceeds is key to enabling democratic accountability.
- The financial structure of ALDRPs: several financial structures are possible for ALDRPs. When implementing ALDRPs with private creditors, debt exchange operations can enable to swap existing debt with an adaptation-linked bond, which a development institution can enhance. This enables to attract private investors. When implementing ALDRPs with public creditors, a restructuring tied to adaptation investment conditions seems to be more efficient than implementing a debt exchange.

The rollout of ALDRPs would also benefit from a series of initiatives and actions on the part of the international community, relevant to each of the four dimensions highlighted above. This policy brief highlights nine actions and initiatives which could be implemented by developed countries, development banks, creditor organizations, and other institutions to contribute to this objective:

- Developed countries could incentivize private financial institutions to contribute to ALDRPs through fiscal and regulatory incentives for financial institutions to take part in ALDRPs.
- Bodies grouping bilateral and private creditors to developing countries could provide guidelines regarding the implementation of ALDRPs in an attempt to strengthen standardization.
- Aid donors, recipient countries, development banks, and relevant international and private organisations could foster the development and convergence of metrics and protocols to monitor adaptation outcomes.
- Development banks and trust funds could publicly state their will to support the development, implementation, and monitoring of adaptation projects resulting from ALDRPs. Development institutions could publicly state their interest in providing credit enhancement as part of ALDRPs.
- The development community could develop a global, publicly-available database highlighting the benefits, key performance indicators, monitoring and information systems, achievements, and potential blended finance schemes used for ODA-funded adaptation projects.

- The newly created G20 Common Framework for Debt Treatments could be enhanced by introducing adaptation investment conditions, which could then be financed through debt write-offs, two features it currently leaves aside. The Framework could also provide for the introduction of clauses in bilateral debt contracts highlighting ALDRPs as a tool for debt relief.
- Multilateral development banks and trust funds could develop a certification of ALDRPs, which could contribute to attracting private financing.
- Developing countries should require the introduction of collective action clauses in bond agreements. Such clauses can facilitate the implementation of ALDRPs.
- The IMF and World Bank should include climate risks analysis in Debt Sustainability Analyses. As the IMF usually plays a central role in debt restructuring operations, such analyses could provide a basis for implementing ALDRPs.

ALDRPs can contribute to debt sustainability and adaptation investments in developing countries. However, they can only palliate some of the structural deficiencies of the international monetary system, which are conducive to debt distress and lack of adaptation:

- The international monetary system features procyclical tendencies, limiting the effectiveness of governments and central banks' countercyclical policies in developing countries. The international financial safety net available to developing countries to manage crises resulting from busts is thin. Most of them are, for instance, excluded from central banks' swap networks, and the lack of a global debt workout mechanism results in inefficient debt restructurings when a debt crisis hits a (developing) country. Yet, climate change will strengthen developing countries' macroeconomic instability, making these deficiencies even more tangible.
- The international monetary system also hampers climate adaptation of developing countries in several ways. Developing countries must acquire hard currencies to sustain liquidity in a crisis and to service external debt. Therefore, they focus on short-term, export-led strategies at the expense of long-term development strategies, including climate adaptation strategies. Hard currencies accumulated as reserves cannot be traded against local currency to finance adaptation (or other public good) investments locally. Finally, currency mismatch between assets and liabilities of developing countries, due to their inability to borrow abroad in their currency, induces a risk which is compensated for via higher interest rates, constraining public finance which is the primary type of finance for adaptation projects, because many of them are non-bankable.

Therefore, adequately addressing the original sins and linking the agendas for addressing climate vulnerability and financial challenges of developing countries requires reforming the international monetary system. As part of such a reform, several changes could be envisioned:

- Special Drawing Rights could have a more significant role as reserve assets. Higher SDR allocations to developing countries would reduce the need for developing countries to hold precautionary reserves in hard currencies, which fuel global imbalances and lead to short-term extractive strategies fueling climate change.

- Special Drawing Rights could constitute a new source of funding for climate adaptation. As adaptation finance is severely lacking, due to the public good nature of many adaptation projects and public finance constraints, their use would fill a critical gap.
- Developing countries could use capital account regulations more extensively. They have been found to favor macroeconomic stability, which will be increasingly challenged by strengthening climate change impacts in developing countries.
- The international community should build a global debt workout mechanism. It is an indispensable tool to enable prompt and efficient debt restructurings, while climate-related shocks will likely fuel sovereign debt risk.

Introduction

Recent devastating nature-related events, such as the flooding in Pakistan in 2022 or the Idai cyclone which ravaged Northern Mozambique in 2019, are likely the symptoms of the intensification of climate change¹. The international scientific community is unified in its stand that developing countries in general are the hardest hit relatively by climate change, both because adverse climate-related impacts tend to be concentrated in tropical regions and because developing countries have lesser resources than developed countries to cope with the economic and social fall-outs from climate-related physical impact. This is despite their low historical contribution to global greenhouse gas emissions.

In addition to this climate challenge, developing countries face structural financial and macroeconomic constraints. One of the main reasons for this constraint is that incomplete financial markets impede developing countries (their governments and residents) from borrowing abroad in their currency. Therefore, a significant share of their debt is denominated in foreign currency, usually in US dollars, which exposes them to currency mismatch (debt is denominated in foreign currency while assets or government revenue are in domestic currency). When economic conditions worsen, the exchange rate usually depreciates, which leads to higher debt service in local currency terms. This has been coined an “**original sin**” in economic literature², because the reasons for such an inability to borrow abroad in domestic currency lie in factors outside the control of developing countries³.

In this policy brief, we contend that both the climate vulnerability and financial challenges of developing countries, particularly certain low and lower middle-income countries, can be deemed as “**original sins**”: they have immense negative consequences for their development and stability but their root causes originate primarily from variables independent of their actions and management.

The international community has recently launched several initiatives to catch up and address some of these thorny and complex issues. On the climate vulnerability side, COP 26 laid the ground for doubling climate change adaptation finance by 2025, and COP 27 resulted in the launch of the Sharm-El-Sheikh Adaptation Agenda. It also concluded with the creation of a Loss and Damage Fund to compensate vulnerable countries for climate change impacts. However, these initiatives are likely to fail to fully address adaptation needs of developing countries. Yearly adaptation finance needs of developing countries by 2030 are 3 to 7 times higher than current *global* adaptation investments⁴.

¹ IPCC. 2021. Climate change widespread, rapid, and intensifying, available at <https://www.ipcc.ch/2021/08/09/ar6-wg1-20210809-pr/>

² Eichengreen, B. and Hausmann, R. 1999. Exchange rates and financial fragility, NBER working paper

³ Eichengreen, B. et al. 2002. Original sin: the pain, the mystery, and the road to redemption

⁴ UNEP. 2022. Adaptation Gap report 2022, available at <https://www.unep.org/resources/adaptation-gap-report-2022>

On the financial vulnerability side, the temporary G20 Debt Service Suspension Initiative, launched in 2020, aimed at tackling the liquidity shortage that developing countries faced during the Covid-19 pandemic. The G20 extended it with a permanent initiative, the G20 Common Framework for Debt Treatments, which aims at improving the global framework for managing developing countries' solvency. It is an agreement of the Paris Club and G20 countries to cooperate on debt treatments for LICs in the event a debt restructuring. The Framework seeks equal treatment of all creditors, which means that they should grant debt relief on comparable conditions, including private creditors who usually do not participate in sovereign debt restructuring and benefit from a *de facto* senior debt position compared to bilateral creditors.

However, these initiatives fall short of linking the international agendas for addressing climate vulnerability and financial challenges of developing countries, even though the strong nexus and the direct interaction between these two dimensions intrinsically make the case to warrant it. On the one hand, the high exposure and lack of adequate resilience to the adverse impact of climate change can exacerbate the weak macroeconomic conditions of many of these developing countries. On the other hand, some of these developing countries' constraints in accessing stable and long-term financial capital further impede financing for crucial adaptation measures necessary to strengthen resilience to the physical impact of climate change events.

This policy brief explores these interactions and seeks to build the case for actively intertwining the international agenda for addressing climate vulnerability and financial challenges of developing countries as a whole.

Section 1 lays out four arguments in favour of intertwining these agendas, by looking at the opportunity for linking climate change adaptation to the prevention and management of debt distress of developing countries.

Section 2 highlights adaptation-linked debt relief programmes (ALDRPs), comprising debt-for-adaptation (DFA) swaps and adaptation-linked restructurings (ALRs), as means to implement this approach, including to tackle the emerging debt crises which many developing countries face as of 2023. DFA swaps are a sub-category of debt-for-climate (DFC) swaps, themselves a sub-category of debt-for-nature (DFN) swaps which are agreements in which a debtor's debt is (partially) forgiven or restructured by a creditor or class of creditors against efforts by the debtor towards environmental protection. DFA swaps are DFN swaps focusing on efforts towards adaptation to climate change. To the best of our knowledge, there have been only two occurrences of DFA swaps, on Seychelles's public debt in 2015 and on Barbados' in 2022, which were only partially aimed at financing adaptation measures. ALRs are (comprehensive) debt restructurings (which can be implemented through different ways reducing debt's present value – e.g., haircuts, grace periods, longer terms...) to which are attached adaptation investment conditions, involving several classes of creditors in an attempt to make the debtor's debt sustainable again. Therefore, ALDRPs are debt relief tools which strengthen the fiscal space of the debtor, addressing the financial and macroeconomic constraints which it faces, and unlock investments for adaptation to climate change, contributing to resilience to climate impacts.

DFN swaps have gained strong prominence over the recent period. While finishing this policy brief, the biggest DFN swap was announced on Ecuador's sovereign debt, in April 2023, involving a debt buyback of \$800 million⁵. Such tools have been analysed by many academics⁶. Several organisations also recently got interested in the topic. For instance, the US Treasury Department launched a working group on DFN swaps in 2021, while the European Commission ordered a report on the topic this same year. The Economic Commission for Latin America and the Caribbean (ECLAC) is rolling out an initiative to implement DFA swaps in the Caribbeans. However, these studies and initiatives insufficiently nail down, in our opinion, DFA swaps and ALRs, as most focus on the broader concepts of DFN or DFC swaps and are more inclined to discuss elements relative to climate mitigation. This policy brief intends to undertake such a piece of work, by proposing a workable methodology for easing the implementation of ALDRPs, such that the roll-out can be scaled and speeded up. We leverage proposals and best practices regarding DFN swaps put forward by others and, when relevant, nail them down to ALDRPs. We also put forward proposals for the international community to implement various actions and initiatives to support the development of ALDRPs.

In sections 1 and 2, we focus on low-income (LICs) and lower middle-income countries (LMCs) as these are the countries for which ALDRPs appear the most relevant. References are made to developing countries in general when supporting data and factual information for LICs and LMCs cannot be adequately or reliably sourced. Indeed, LICs and LMCs are, on average, the countries least resilient to climate change impacts while they only poorly contribute to climate change. As shown in Table 1, average greenhouse gas (GHG) emissions per capita in LICs is below the 2.1 tons of CO₂ per capita threshold, which, according to the United Nations Environment Programme, is the threshold which should be achieved by 2030 globally to limit climate change below +1.5°C⁹. LICs and LMCs are also much less resilient to climate change than upper middle-income countries (UMCs) and high-income countries (HICs), as expressed by a lower average Notre-Dame GAIN index. This index assesses the resilience of a country to climate change, through assessing its vulnerability to climate-related impacts and readiness to face them. The lower the index, comprised between 0 and 100, the less a country is resilient to

Table 1. Resilience to climate change and GHG emissions per capita per income category

	Notre Dame GAIN index ⁷	GHG emissions per capita ⁸
LICs	35.5	1.9
LMCs	42.7	3.3
UMCs	49.8	8.1
HICs	61.2	11.7

Sources: Notre Dame Global Adaptation Initiative, Notre Dame GAIN Index and Our World in Data, Per capita greenhouse gas emissions 2019

⁵ Reuters. 2023. Ecuador launches a debt buyback plan aimed at Galapagos protection.

⁶ See for instance Essers, D. 2021. Debt-for-climate swaps in the COVID-19 era: killing two birds with one stone?, Analysis and policy brief, 43 / Steele, P. and Patel, S. 2020. Tackling the triple crisis. Using debt swaps to address debt, climate and nature loss post-COVID-19, Shaping Sustainable Markets Papers, International Institute for Environment and Development / Volz, U. et al. 2021. Debt Relief for a Green and Inclusive Recovery: Securing Private-Sector Participation and Creating Policy Space for Sustainable Development, Heinrich Boll Foundation, Center for Sustainable Finance (SOAS, University of London), Global Development Policy Center (Boston University)

⁷ Cross-country non-weighted average

⁸ Cross-country population-weighted average

⁹ This threshold is expressed in CO₂ and not CO₂equivalent

United Nations Environment Programme (UNEP). 2020. Emissions gap report 2020.

climate change¹⁰. LICs and LMCs are also relatively the most constrained in their ability to access financial capital efficiently and sustainably.

Section 3 opens up on whether a reform of the international monetary system will eventually be required for a complete integration between the international agenda to address climate vulnerability and the financial issues of developing countries. It would be a fair assessment to state that, when writing this policy brief, a full-fledged discussion of the vital deficiencies of the international monetary system when it comes to accelerating climate change impacts - and the potential solutions to remedy it effectively - has not really started. Section 3 of this policy brief aims to trigger such a discussion, which we will develop in future research to further highlight the link between environmental conditions and financial fragilities of developing countries.

¹⁰ The ND-GAIN index is available at <https://gain.nd.edu/our-work/country-index/>.

Section 1: four arguments for linking climate change adaptation to the prevention and management of debt distress of developing countries

Argument 1: a debt crisis is looming in many low-income and lower middle-income countries

Many LICs and LMCs are, as of beginning of 2023, at the edge of a public debt crisis. This can be approached in three contributing factors: a steady increase in debt and debt service levels before the onset of the Covid-19 pandemic; the negative shock the pandemic triggered; and the impact of the current macroeconomic situation characterized by geo-political tensions, commodity price inflation, rising interest rates and monetary contraction, among others.

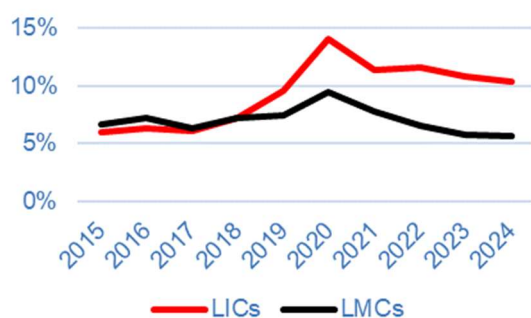


Figure 1: Service on external public debt, share of government revenue

Source: World Bank, International Debt Statistics

Factor 1: External public debt of LICs and LMCs increased by respectively 25% and 39% in absolute value from 2015 to 2019. While the service on this debt increased on par for LMCs, it increased by more than 60% for LICs¹¹. This led to close to a doubling of external public debt service to government revenue between 2015 and 2019 for LICs (Figure 1).

Factor 2: The Covid-19 pandemic led to a contraction of GDP growth, which totaled 0.1% in LICs and -3.3% in LMCs in 2020¹². The prevailing trend of increase in debt reimbursements and interest payments, which was already hardly serviced through growth, started putting strong pressure on government revenues when growth vanished. 14% (10%) of government revenue of LICs (LMCs) was dedicated to debt service in 2020, and this figure will plateau strongly above its pre-Covid level at least until 2024 for LICs (Figure 1).

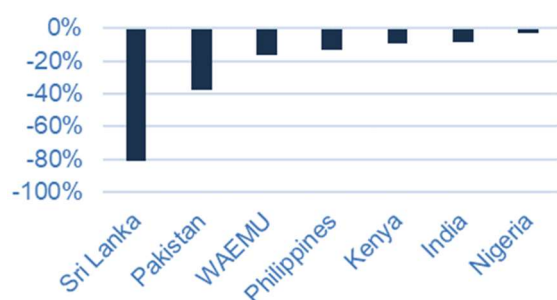


Figure 2: National currency devaluation compared to dollar, from 2021 Q3 to 2022 Q3

Source: Investing.com

¹¹ For LICs and LMCs covered by World Bank, International Debt Statistics, available at <https://www.worldbank.org/en/programs/debt-statistics/ids>

¹² World Bank, World Development Indicators, available at <https://databank.worldbank.org/source/world-development-indicators>

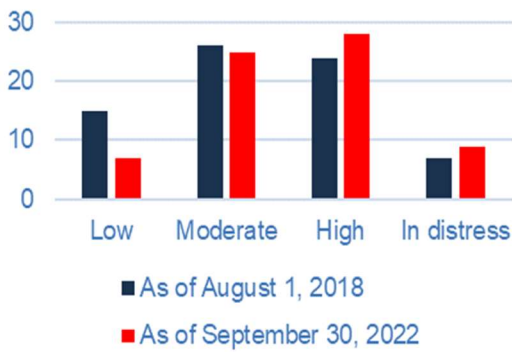


Figure 3: Number of developing countries in low, moderate, high risk of external debt distress, and in external debt distress

Source: World Bank, Debt Sustainability Analysis

Factor 3: The global slowdown triggered by the crisis was further exacerbated by the Russia-Ukraine war. It put pressure on already tense commodity prices, triggering inflation. The global slowdown triggered a flight to hard currencies (mostly to the US dollar), which created depreciation pressures on developing countries’ currencies and further fuelled inflation. The response to it – interest rate hikes by central banks of developed economies - further enhanced depreciation pressures on developing economies (Figure 2). These developments contributed to enhancing the cost of external debt service of developing economies. Since a significant share of the external public debt of developing economies has variable interest rates, it also contributed to increasing base interest rates and therefore absolute debt servicing costs.

As of September 2022, as a consequence of these three factors, 37 developing countries were at high risk of debt distress or already in debt distress (Figure 3). This shows how developing countries, especially LICs and LMCs, are vulnerable to changes in the global financial environment which are out of their control.

Argument 2: climate change impacts are accelerating in low-income and lower middle-income countries

Developing countries are at the forefront of climate impacts. As Figure 4 shows, the number of disasters which are enhanced by climate change is strongly increasing since the early 1970s. It has been increasing faster in current LICs and LMCs than in UMCs and HICs, because of differentiated geographical exposures to climate change impacts but also less resilience to them compared to more developed countries.

Moreover, as Figure 5 shows, climate change may have tremendous detrimental impacts on GDP. If most studies only anticipate a few percent decline in GDP growth by 2050/2100 due to climate change¹³, they leave in the dark a significant share of the future impacts of climate change on the economy. This is simply because not all impacts and impact transmission channels to the economy can be modelled¹⁴, but if taken into account, it may make the picture look a lot starker. Swiss Re, the leading global reinsurer, estimates that a 3.2°C temperature increase could lead to up to 25% of GDP reduction in Africa and Asia by 2050 relative to no climate change and when trying to account for unknown impacts and unknown impact channels, against “only” 3 to 5% when such impacts and channels are not accounted for (Figure 5)¹⁵.

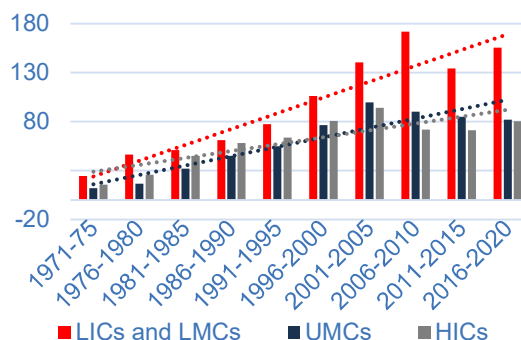


Figure 4: Number of nature-related disasters which are enhanced by climate change. Disasters enhanced by climate change are heat waves, storms, avalanche, landslides, mudslides, floods, forest and land fires, glacial lake outbursts, droughts. Source: EM-DAT – The international disaster database, available at <https://www.emdat.be/>



Figure 5: GDP change by 2050 under a +3.2°C scenario with and without trying to account for unknown impacts and impact channels Source: Swiss Re. 2021. The economics of climate change: no action not an option.

¹³ William Nordhaus, using the DICE model, for instance estimates that a global warming of +6°C will reduce GDP by only 8% by 2100, a strongly underestimated figure. A global warming of +6°C would lead to several tipping points being crossed, and significant parts of the planet becoming unliveable for humans.

¹⁴ Which results from many difficulties such as (non-exhaustively) the difficulty to take into account specific climate-related acute and chronic risks and their potentially non-linear relation with both temperature rise (e.g. tipping points) and the economy, the uncertainty associated with seeing acute and chronic risks increasing at a global level and not only locally, and the social consequences that the materialisation of such risks may have.

¹⁵ Swiss Re estimates the unknown impacts and impact channels by using a multiplying factor of 10 on the modeling results without taking them into account. Despite this methodology being rudimentary, it has the merit of acknowledging the strong limitations associated with leaving aside such unknown impacts and impact channels.

Argument 3: adaptation finance needs in developing countries are substantial and unfulfilled

Required adaptation investments in developing countries are high. The United Nations estimates the annual cost of adaptation in developing countries¹⁶ to be \$160 billion by 2030 and \$315 billion by 2050 if global warming is contained below +2°C by 2100. These figures double to reach \$340 billion and \$565 billion respectively under a +4°C scenario¹⁷ (Figure 6).

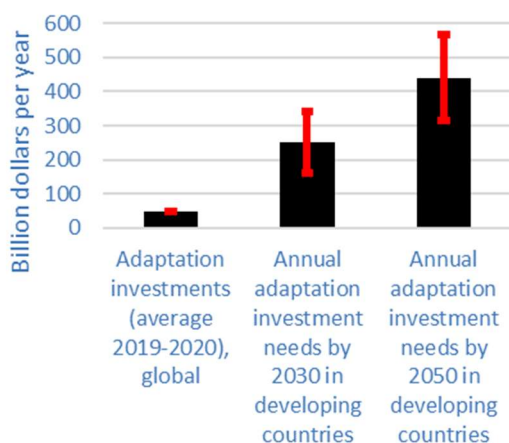


Figure 6: Current and required annual adaptation investments

Source : CPI. 2022. *Global landscape of climate finance landscape 2022*, and UNEP. 2022. *Adaptation Gap report 2022*

Current adaptation investments in developing countries are at best minimal or low if not virtually non-existent compared to the level needed. The Climate Policy Initiative estimates that adaptation investments currently amount to \$49 billion *globally* (Figure 6)¹⁸. Current *global* adaptation investments are therefore three to seven times less that what would be required yearly by 2030 in developing countries only. Moreover, official development assistance (ODA) is falling short of the needs of developing countries, with an estimated bilateral public flow channelled to adaptation projects of \$20 billion in 2019¹⁹, and multilateral flows from development banks of \$15 billion that same year²⁰. Such low investments are tied to several reasons. Among others, climate physical risks are still poorly known and mapped; the public good nature of most adaptation projects makes them unproper to private financing; public finance of developing countries is constrained; ODA actors still overwhelmingly prioritize mitigation over adaptation.

¹⁶ Because of data constraints, it has not been possible to assess investment needs only in LICs and LMCs.

¹⁷ UNEP (2022)

¹⁸ Climate Policy Initiative. 2022. *Global landscape of climate finance: a decade of data*.

¹⁹ UNEP. 2021. *Adaptation gap report 2021*.

The figure is based on OECD-DAC data, and combines adaptation-related finance marked as principal and significant under the Rio markers – a methodology used by the OECD DAC members to report on development finance related to the environment. This figure is not comparable to the figure provided by CPI since it uses a different methodology.

²⁰ UNEP (2021). This figure is not comparable to the figure provided by CPI since it uses a different methodology.

Argument 4: a climate liability of Global North to Global South mirrors a financial liability of Global South to Global North

Cumulative and overshoot GHG emissions are mostly accounted for by Global North countries. Hickel (2020) shows that two-thirds of cumulative greenhouse gas (GHG) emissions from 1850 to 2015 were accounted for by Global North countries²¹, and another third by Global South countries²² (Figure 7.a). But what matters more for identifying responsibilities in the climate breakdown are GHG emissions above a certain threshold from which climate starts changing significantly. Hickel (2020) came up with a method to do so. Its methodology relies on the idea that each person is entitled to an equal amount of GHG emissions, and emissions above this threshold are considered overshoot emissions²³. To identify this threshold, he uses a carbon budget equivalent to 350 parts per million (ppm) of atmospheric CO₂ concentration, the CO₂ atmospheric concentration threshold above which climate is significantly altered. It then allocates it to countries according to their share in global population, using population averages from 1850 to 2015, allowing to determine each country's fair share in the carbon budget. Results indicate that as of 2015, the Global North was responsible for 92% of historical overshoot emissions (Figure 7.b). It can therefore be argued that (at least some) Global North countries have a “climate liability” to (at least some) Global South ones, because of their overuse of the atmosphere.

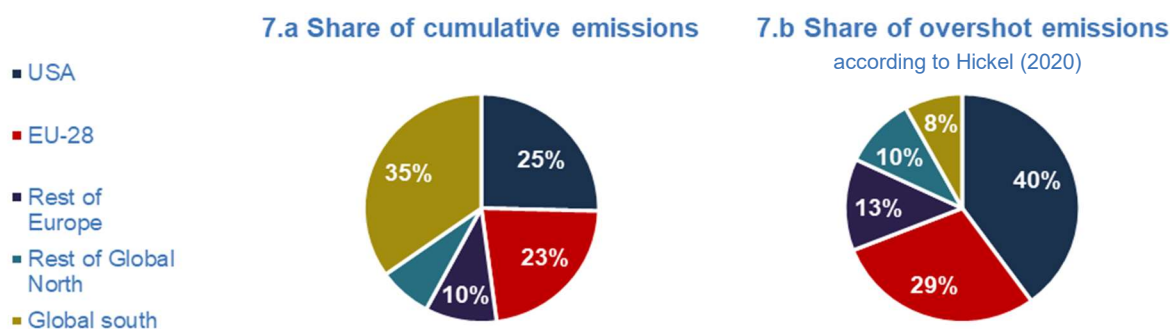


Figure 7: Share of Global North and Global South in cumulative (3.a) and overshoot (3.b) emissions until 2020

Source: Global Carbon Project (cumulative emissions), Hickel (2020) (overshoot emissions).

This “climate liability” mirrors a financial liability from South to North. As of 2022, LICs, which are all Global South countries, owed \$18 billion to Paris-club members²⁴ on their external public debt, which are all Global North countries, and \$90 billion to private creditors (loans or bonds), which a significant share is likely to be owed to creditors from Global North countries²⁵.

²¹ Global North: USA, Europe, Israel, Japan, Canada, Australia, New Zealand. Global South: rest of the world; Latin America, Africa, the Middle East and Asia.

Hickel, J. 2020. Quantifying national responsibility for climate breakdown: an equality-based attribution approach for carbon dioxide emissions in excess of the planetary boundary, *The Lancet*.

²² Because of data constraints, it has not been possible to provide a figure for the cumulative emissions of LICs and LMCs.

²³ The way overshoot emissions are calculated gives rise to ethical challenges. Here, the choice has been made to rely on a fair share approach rooted in the principle of equal access of every individual to global commons, such as the atmosphere. Other approaches can be used to determine historical responsibilities for climate change, and this example should only be considered as an option for approaching this topic, among others.

²⁴ The Paris club is an informal group of public creditors from developed countries to enable coordinated solutions for highly indebted countries to which they lend.

²⁵ Jubilee Debt Campaign et al. 2020. Under the radar – Private sector debt and coronavirus in developing countries.

The combination of strong financial vulnerability (argument 1), the negative impact of climate change on GDP (argument 2) and high adaptation investment needs (argument 3) makes the financial outlook of developing countries quite preoccupying. Figure 8 shows that, on average for LICs and LMCs, the higher the risk of external debt distress, the lower the resilience to climate change as expressed by the ND-GAIN index. The countries most impacted by climate change, which have the highest adaptation investment needs relative to their financial resources, are facing aggravated financial constraints. The lack of investments in adaptation will likely further worsen this constraint and fuel debt distress, potentially triggering doom loops of climate change adverse events and financial crises in the future.

Therefore, the approach of linking the prevention and management of debt distress of developing countries with climate adaptation makes sense. A way to do this is by acknowledging the notion that developed (Global North) countries have a pent-up climate liability owed to developing countries (argument 4), which can be justified as the moral basis for the former to provide debt relief to the latter in the form of ALDRPs.

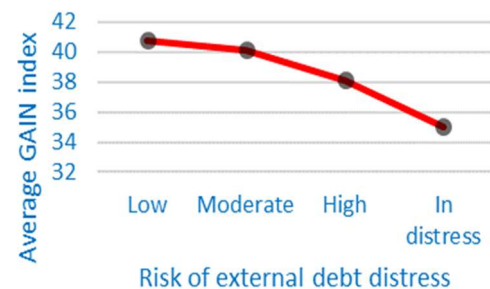


Figure 8: Average GAIN index of LICs and LMCs per category of risk of external debt distress as of September 2022. There are 6 countries with low risk, 23 with moderate risk, 20 with high risk and 8 in distress. Source : Notre-Dame GAIN index and World Bank, Debt Sustainability Analyses.

Section 2: linking climate change adaptation to the prevention and management of debt distress of developing countries

1. Implementing adaptation-linked debt relief programmes

ALDRPs²⁶ can strengthen the macro-fiscal resilience of LICs and LMCs and feature a strong potential for mobilising new finance for adaptation. According to the IMF, climate-linked debt relief programmes including ALDRPs “have an efficiency advantage over the “unbundled” alternatives (i.e., separately providing debt relief and subsidizing climate action through conditional grants or preferential loans) *when climate actions have a significant impact on the solvency of the borrower*”. This is because providing debt relief without climate adaptation conditions gives rise to moral hazard, in which use of the fiscal space freed by the operation is to the discretion of the debtor, while costs are shared between the debtor and creditors²⁷. Directing part of the relief towards adaptation investments through ALDRPs can contribute to make the country more resilient to climate change impacts, and therefore can enhance the solvency of the borrower. Beyond such efficiency elements, the IMF argues, there are pragmatic cases for ALDRPs. First, they can strengthen the willingness of creditors to provide (additional) relief. Secondly, when concessional finance is constrained, ALDRPs can constitute a second-best option to finance adaptation projects (even when they do not have a strong impact on financial solvency)²⁸. Finally, we add that ALDRPs implemented through leveraging privately-owned sovereign debt are a way to mobilise private financing for adaptation, which is scarce due to the public good nature of adaptation projects but absolutely needed to bridge the adaptation finance gap²⁹.

There has been, to the best of our knowledge, only two implementations of ALDRPs, in the form of DFA swaps. These were only partially aimed at financing adaptation measures, and also focused on other environmental protection aspects. In 2015, Seychelles closed a deal to buy back \$21.6 million of its sovereign debt owned by Paris club creditors through grants provided by philanthropies and a loan provided by The Nature Conservancy (TNC). In exchange, Seychelles committed to increase investment in marine conservation and climate adaptation. Adaptation investments aimed at protecting coral reefs and mangroves to buffer against sea level rise and storms. The scale of the operation was however quite limited, the discount on the debt buy back reaching only 6.5%, or \$1.4 million. Another DFA swap was implemented by TNC with Barbados in 2022, in

²⁶ As a reminder, we gather under adaptation-linked debt relief programmes (ALDRPs) both debt-for-adaptation (DFA) swaps and adaptation-linked restructurings (ALRs). DFA swaps are a sub-category of debt-for-climate (DFC) swaps, themselves a sub-category of debt-for-nature (DFN) swaps which are agreements in which a debtor’s debt is (partially) forgiven or restructured by a creditor or class of creditor against efforts by the debtor towards environmental protection. DFA swaps are DFN swaps focusing on efforts towards adaptation to climate change. ALRs are (comprehensive) debt restructurings to which are attached adaptation investment conditions, involving several class of creditors in an attempt to make the debtor’s debt sustainable again.

²⁷ Chamon, M. et al. (2022)

²⁸ Ibid.

²⁹ UNEP (2022).

which \$150 million of debt were bought back at a slight discount and converted into cheaper debt, unleashing about \$50 million over 15 years in expanding protection of Barbados' coral reefs. The ECLAC has also been advocating for a DFA swap initiative in the Caribbean region since 2015, which has yet to materialise. Implementations of ALDRPs have therefore been scarce and are quite recent. There is a need to better explore their potential and favour a transition from a case-by-case approach to more predictable set ups, so that they can significantly contribute to both debt sustainability and adaptation of LICs and LMCs to climate change.

In this sub-section we provide orientations to ease the implementation of ALDRPs and scale them up, in particular through leveraging debt owned by private actors. We propose orientations to identify countries relevant for such interventions, the creditor classes which should be targeted under different conditions, the way to use proceeds of ALDRPs and the financial mechanisms to leverage. We provide recommendations for incentivizing private actors to take part in such programmes. Providing guidelines for bringing nature-linked debt relief programmes from piecemeal tools to more standardized instruments has been advocated for by several organisations and scholars³⁰. We do so more specifically for ALDRPs, even though many recommendations are also relevant for any type of nature-linked debt relief programme.

We focus on ALDRPs on external sovereign debt of LICs and LMCs. The debt most problematic for debt sustainability of such countries is usually external debt, given that it is labelled in a foreign currency and is therefore subject to exchange rate variations and strong valuation effects. Moreover, ALDRPs on external debt can be a vehicle for international climate justice, which is not the case for domestic debt.

A. What countries are the most relevant for adaptation-linked debt relief programmes?

DFA swaps and ALRs should be used in different conditions. Both are relevant, from a strict financial point of view, when adaptation investments are efficient in strengthening long-term solvency of the borrower country. They can therefore contribute to long-term debt sustainability through providing immediate relief and improving long-term resilience to climate-related shocks. DFA swaps should be used when fiscal space is constrained but debt is not unsustainable³¹. DFA swaps can therefore be thought of as precautionary actions with regard to debt sustainability and adaptation to climate change. ALRs should be used when a country is defaulting, or close to be defaulting on its external debt. When this is the case, DFA swaps can nonetheless dominate ALRs if they significantly contribute to strengthening debt sustainability and when debt restructuring bears large (reputational and economic) costs³².

³⁰ See for instance Chamon, M. et al. (2022) or Rambarran, J. 2018. Debt for climate swaps: lessons for Caribbean SIDS from the Seychelles experience, *Social and Economic Studies*, vol. 67, n°2/3.

³¹ Chamon, M. et al. (2022)

³² Ibid.

ALDRPs should contribute to achieve domestic policy goals and debtor countries should show a relatively qualitative governance and public management. The debtor country should have a government able to control, govern and rule its territory. The government should have a good understanding of how to use the funds freed by an ALDRP, which requires sound policy objectives, planning and coherence³³. The debtor country should feature qualitative governance and controls of corruption³⁴ to ensure the adequate use of the proceeds of the programme. Low quality of governance and therefore concerns over the use of proceeds can significantly deter creditors to engage in ALDRPs. Finally, the debtor country should feature qualitative macroeconomic management (especially exchange rate and inflation management) to ensure the real value of the proceeds of the programme over the course of their use.

A series of indicators can be derived from the information in the two preceding paragraphs, which can enable to identify countries which are most suited, theoretically, for DFA swaps and ALRs.

- **Fiscal space constraint:** The World Bank-IMF Debt Sustainability Analyses provide information on the level of external debt distress of a country³⁵. One could also use sovereign debt ratings by credit rating agencies, such as S&P, to assess the constraint weighing on government spending. Sovereign ratings are however a lot less comprehensive on LICs and LMCs than Debt Sustainability Analyses.
- **Ability of adaptation to foster long term debt sustainability:** The Notre-Dame GAIN index assesses the resilience of a country to climate change. In the absence of a better suited tool for the targeted objective of assessing the impact of climate change on long-term debt sustainability, it can be used as a proxy of this criterion.
- **Ability of an ALDRP to contribute to domestic policy goals:** The ability of an ALDRP to contribute to domestic policy goals can be proxied, as a first approach, through assessing if the country has mapped and quantified adaptation investment needs. Having done so enables to have a preliminary understanding of how the proceeds of an ALDRP could be used. It also contributes to strengthen credibility in the eyes of investors potentially interested in ALDRPs. This criterion can be assessed through National Adaptation Plans (NAPs) or Nationally Determined Contributions (NDCs), two documents requested by the United Nations Framework Convention on Climate Change. A country which has quantified adaptation investments in one or the other of these documents, despite their variable quality, can be deemed to have a minimal understanding of adaptation challenges, their interrelations and interventions required to tackle them. This should however be strengthened by an analysis of the quality of the assessment, including relevance of proposed measures and cost accuracy.
- **Quality of governance, including macroeconomic governance:** The quality of (macroeconomic) governance of a country can be proxied through the IDA resources allocation index (RAI), which assesses a set of 16 governance criteria related to quality of economic management, structural policies, policies for social inclusion and equity, and public sector management and institutions. Alternatively, one could also use the results of the Public Expenditure and Financial Accountability (PEFA)

³³ Munevar, D. 2021. Making sense of Belize's Blue Bond proposal.

³⁴ Steele, P. and Patel, S (2020)

³⁵ When a DSA is not available, one can leverage article IV consultations by the IMF or sovereign credit ratings.

assessments, which is a framework assessing the strengths and weaknesses of public financial management using quantitative indicators across 94 dimensions.

The Table below summarizes these four criteria and the metrics used to assess them (other metrics, as already mentioned, could have been used as well).

Criteria	Indicator	Source
Fiscal space constraint	Risk of external debt distress assessed as in distress (ALRs), high or moderate (DFA swaps)	World Bank and IMF Debt Sustainability Analyses
Ability of adaptation to foster long term debt sustainability	Notre Dame GAIN Index	Notre-Dame University
Ability to contribute to domestic policy goals	Adaptation-related investments are mapped and quantified in a coherent policy roadmap	National Adaptation Plans and/or Nationally Determined Contributions
Quality of governance, including macroeconomic governance	IDA resource allocation index (RAI)	World Bank Country Policy and Institutional Assessment

Using these indicators, countries are ranked in the two following lists based on their relevance for implementing, respectively, DFA swaps and ALRs. Out of countries featuring a high or moderate risk of external debt distress (which can be candidates for DFA swaps) or already in external debt distress (which need a large restructuring of their debt and may therefore be candidates for ALRs), only the ones with quantified adaptation investment needs in their NAPs or NDCs have been selected. We then applied a min-max normalization to the GAIN index, the IDA resource allocation index and the level of external debt distress (only for the countries which may be relevant for DFA swaps, *i.e.* that feature a moderate to high risk of external debt distress). We averaged these out to rank countries. Countries ranking highest are presumably the most relevant for DFA swaps and ALRs according to this methodology³⁶.

Country	GAIN index	IDA resource allocation index	Risk of external debt distress	Rank
Kenya	38,7	3,8	H	1
Ethiopia	37,2	3,4	H	2
Mauritania	39,3	3,4	H	3
Cameroon	39,0	3,3	H	4
Burundi	35,5	2,9	H	5

³⁶ Afghanistan and Sudan have been excluded from the lists considering their current political situations.

³⁷ Sovereign risk evolves quickly as of beginning of 2023, due to the international context. Estimates of external debt distress by DSA analyses may not reflect accurately the current debt situation of countries because they are not updated in real time. They only give a first approximation of a country's debt situation.

Guinea-Bissau	30,6	2,4	H	6
Haiti	35,0	2,6	H	7
Papua New Guinea	37,4	2,8	H	8
Djibouti	42,4	3,1	H	9
Comoros	37,5	2,7	H	10
Niger	32,9	3,4	M	11
Rwanda	42,0	4,1	M	12
Uganda	35,4	3,6	M	13
Benin	38,2	3,7	M	14
Burkina Faso	37,2	3,5	M	15
Mali	34,7	3,2	M	16
Côte d'Ivoire	39,6	3,6	M	17
Senegal	40,9	3,7	M	18
Madagascar	35,3	3,3	M	19
Tanzania	39,1	3,5	M	20
Togo	41,4	3,5	M	21
Guinea	39,0	3,3	M	22
Nicaragua	41,3	3,3	M	23
Cabo Verde	51,5	3,8	M	24
Solomon Islands	42,2	2,9	M	25
Kyrgyz Republic	52,2	3,6	M	26

Table 4: LICs and LMCs presumably most relevant for ALRs as of beginning of 2023

Country	GAIN index	IDA resource allocation index	Rank
Republic of Congo	34,8	2,7	1
Ghana ³⁸	44,0	3,6	2
Somalia	34,2	2,1	3

Key takeaways

- Beneficiary countries of ALDRPs should be strongly exposed to climate change impacts
- Beneficiary countries of DFA swaps should feature tight fiscal space but sustainable debt
- Beneficiary countries of ALRs should be in default or close to be defaulting
- Beneficiary countries should have quantified adaptation investment needs and clear adaptation plans and policy objectives
- Beneficiary countries should feature (relatively) strong governance and institutional capacity in order to manage the proceeds of an ALDRP and to reassure creditors over use of proceeds

³⁸ Ghana is classified as showing a high risk of external debt distress by the Debt Sustainability Analysis of the World Bank, which was implemented at the end of 2021. However, when writing this policy brief, Ghana had defaulted on its external debt, logically bringing the country to the “in distress” category.

B. What type of debt to leverage for adaptation-linked debt relief programmes?

Historically, two types of DFN swaps have been implemented, leveraging debt owned by either public or private creditors. Paris club creditors have engaged in such programmes several times since the 1980s. For instance, the swap on Seychelles' debt in 2015 was conducted on debt due to Belgium, France, Italy and the United Kingdom. Previously, Paris club creditors also provided debt relief to Poland tied to a commitment on the part of the latter to use the relief to finance a trust fund for the protection of the environment. DFN swaps also took place with private bondholders. For instance, as part of a DFN swap concluded in 2021, Belize managed to reduce its external debt burden (in the form of bonds) by 12% of GDP against a commitment to protect and invest in the protection of the environment. These two asset classes – Paris club bilateral debt and bonds - are the most important candidates for DFA swaps. Indeed, the Paris club already provides a framework and collaboration forum for debt relief, and swaps on sovereign bonds are able to attract private investors when bonds are traded at a discount. The tradable and standardized character of sovereign bonds also make access to information on such products fairly easy, as opposed to commercial bank loans.

Privately-held sovereign bonds are even more relevant to focus on when there are few, or only one, outstanding sovereign bonds and if they feature collective action clauses. This eases the negotiation process with investors. The terms and conditions of different bonds are different, complexifying the identification of treatments acceptable to different bondholders. Collective action clauses are contractual provisions in sovereign bond contracts enabling a supermajority of bondholders (usually 75%) to impose a debt restructuring to the minority. Their presence therefore increases the likelihood that a DFA swap (or an ALR) will be implementable.

There are also signs that debt owned by China could be leveraged for DFN swaps (including DFA swaps), even though there are no historical occurrences. China is the most important holder of developing country debt, owning according to estimates about 20% of African public debt³⁹. A recent report commissioned by the Green Finance Committee, an emanation from Chinese public institutions, highlighted ten recommendations for China to implement DFN swaps⁴⁰. The International Institute of Green Finance – a Chinese think tank – also published a brief in which it argued that DFN swaps were a “triple-win” solution for China as a creditor (allowing it to gain international political leadership), for its debtors and for nature⁴¹. Having China contributing to a DFA swap would incentivize other bilateral creditors, especially Paris club creditors, to take part in such programmes. Paris club creditors are indeed reluctant to restructure developing countries' debt if China does not take part, given the increasing geopolitical rivalry between these poles and given the significant share of developing countries' debt owned by China.

³⁹ Sun, Y. (Brookings). 2020. China and Africa's debt: Yes to relief, no to blanket forgiveness.

⁴⁰ Swanson, E. et al. 2022. Debt for nature swap – A green finance tool for dealing with overseas sovereign debt, Green Finance Committee, Paulson Institute and FISF

⁴¹ Yue, M. and Nedopil Wang, C. 2020. Debt-for-nature swaps: a triple win solution for debt sustainability and biodiversity finance in the Belt and Road Initiative?, IIGF Green BRI Center

Commercial banks loans could also be leveraged for DFA swaps, even though it is likely to be much more challenging than the previously mentioned creditor classes. Bank loans often feature high interest rates and/or short repayment periods, providing significant lever for debt relief and strengthened sustainability⁴². They are however non-standardized, poorly transparent and sometimes backed by collateral, which significantly complicates implementing an ALDRP on such an asset class.

Private bondholders are more inclined to engage in DFA swaps if debt is risky and its present value is significantly below face value. In such situations, creditors have an incentive to give up their claim against the certainty to get paid part of it. This means that, to leverage privately-owned debt in a DFA swap, debt risk should be significant, but not high enough to require an ALR. One can monitor the market value of sovereign bonds to get a sense of the likelihood of private bondholders' participation. The more bonds are traded below face value, the more the market perceives them as risky. Table 5 summarizes the evolution of the JPM EMBI Diversified indices – which monitors sovereign bonds emitted by emerging and developing economies – for a subset of African countries⁴³ over 2022, indicating strong decrease in the market value of sovereign bonds for several countries.

Table 5: Performance of selected JPM EMBI Diversified indices for year 2022							
	Ghana	Rwanda	Senegal	Nigeria	Kenya	Cote d'Ivoire	Angola
Performance of JPM EMBI diversified indices	-50%	-18.5%	-15.2%	-14.2%	-9.6%	-5.4%	-1.8%

Source: Reuters. 2022. *Who holds Ghana's debt and what restructuring is planned?*

As part of the DFN swap implemented on Belize's debt, the country took advantage of a fall in the market price of its bonds at the beginning of 2020 and conducted a debt buyback. It was able to repurchase part of its public debt owned by bondholders at 55% of face value. Strong prospects for private creditors participation, when debt is traded/valued significantly below face value, contribute to contain transaction costs as a share of the overall debt relief. Indeed, the higher the risk of debt, the higher the discount private creditors will be willing to accept (everything else being equal). To the contrary, when debt is moderately risky, bilateral creditors (especially Paris club creditors) are more relevant to focus on than private creditors. Such creditors may be willing to provide a (slight) debt relief as part of a DFA swap even if debt is not significantly risky, as Belgium, France, Italy and the United Kingdom have done for instance as part of the DFA swap on Seychelles' debt⁴⁴.

⁴² The Nature Conservancy (TNC). 2022. Case study: Belize debt conversion for marine conversation.

⁴³ Data for countries which appear the most relevant for DFA swaps and ALRs according to our methodology could not be retrieved.

⁴⁴ Convergence, NatureVest and The Nature Conservancy. 2017. Case study – Seychelles debt conversion for marine conversation and climate adaptation.

ALRs, by definition, should leverage the debt owned by several classes of creditors⁴⁵. However, historically, the contribution of private creditors to debt restructuring programmes of debt distressed developing countries has been scarce and is likely to remain so. Private creditors have an incentive to free-ride debt restructuring processes, and debtor countries are reluctant to restructure private debt due to the potential negative impact on credit ratings. Private creditors may however be more inclined to contribute to restructurings if these are tied to adaptation investments in ALRs, as they can strengthen future debt sustainability, and if the restructuring involves swapping distressed debt against a bond attached to green use of proceeds (cf. point 1.D of this section “What financial structure for ALDRPs?”). Nonetheless, strengthening the contribution of private actors to restructurings, which is a requirement to scale up ALRs, is likely to require reforming the international monetary system. This is discussed in section 3 of this policy brief.

Table 6 and 7 below show the external debt stock by creditor type for countries which are the most relevant for DFA swaps and ALRs respectively. Table 6 shows that DFA swaps on the debt owned by private bondholders or on Paris club creditors – the most important candidates for DFA swaps - can only enable slight debt relief and covering of adaptation investment needs. Because Paris club countries only own a very minor portion of LICs and LMCs debt, there is a strong need to leverage debt owned by non-Paris club creditors such as China to implement DFA swaps. Table 7 shows for instance that, for Ghana which has significant adaptation investment needs, an ALR on bilateral debt and bonds can significantly contribute to cover adaptation investment needs. If we consider a fictitious ALR of Ghana’s bilateral debt and privately-owned bonds, which would result in a reduction of 40% of such debt, half of which being oriented towards adaptation investments, the debt-to-GDP ratio would decrease to about 80% and about 25% of adaptation investment needs would be covered (cf. point 3 of this section “Country example: implementing an ALR in Ghana”).

Table 6: External debt stock by creditor type for LICs and LMCs most relevant for DFA swaps as of end of 2021 or most recent data available

In % of GDP	Public debt to GDP	Of which domestic	Of which external	Multi-lateral	Bilateral			Private creditors		Adaptation investment needs
					Paris club	Non Paris club	Of which China	Banks loans	Bonds	
Kenya	70%	38%	32%	14%	3%	7%	6%	1%	6%	34%
Ethiopia	53%	28%	25%	13%	1%	7%	N/A	4%	1%	81%
Mauritania	53%	13%	40%	23%	2%	15%	3%	0%	0%	94%
Cameroon	46%	14%	32%	13%	4%	9%	8%	2%	2%	0.3%

Source: debt related data is extracted and reprocessed from the World Bank International Debt Statistics and World Development Indicators, IMF-World Bank Debt Sustainability Analyses, and Jubilee Debt Campaign. 2018. Africa’s growing debt crisis: who is the debt owed to?. Adaptation investment needs are extracted either from NAPs or NDCs. Data is sometimes approximate.

⁴⁵ Including domestic creditors, which are not dealt with in this policy brief.

Table 7: External debt stock by creditor type for LICs and LMCs most relevant for ALRs as of end of 2021 or most recent data available

In % of GDP	Public debt to GDP	Of which domestic debt	Of which external debt	Multi-lateral	Bilateral			Private creditors		Adaptation investment needs
					Paris club	Non Paris club	Of which China	Banks loans	Bonds	
Congo Rep	84%	36%	47%	7%	3%	19%	6%	17%	2%	3.3%
Ghana (end of 2022)	93.5%	31%	62%	13%	2%	5%	4%	10%	28%	27%

Source: data extracted and reprocessed from the World Bank International Debt Statistics and the World Development Indicators, IMF-World Bank Debt Sustainability Analyses, and Jubilee Debt Campaign. 2018. *Africa's growing debt crisis: who is the debt owed to?*. For Ghana, data is extracted from its last Debt Sustainability Analysis, from Bank of Ghana. 2023. *Summary of Economic and Financial data - January 2023* and from Reuters. 2022. *Who holds Ghana's debt and what restructuring is planned?*. Adaptation investment needs are extracted either from NAPs or NDCs. Data is sometimes approximate.

Key takeaways

- Paris club debt and privately-held bonds are the most relevant asset classes to focus on for DFA swaps. Debt owned by China (and other bilateral creditors) could also be a candidate for DFA swaps. Bank loans are likely to be harder to leverage for DFA swaps.
- ALRs, by definition, should involve as many asset classes as possible.
- When debt is highly risky, bondholders are likely to have an incentive to give up their claims against a lower amount than face value of the bonds
- When debt is moderately risky, it is more likely that only bilateral creditors, especially Paris club creditors, will be willing to swap their claim(s)

C. How to use the proceeds of adaptation-linked debt relief programmes?

Country ownership of the use of proceeds of an ALDRP is key to entrench long-term institutional capacity to adapt to climate change. An ALDRP can either be project-based or programme-based⁴⁶. The former entails dedicating the proceeds of the programme towards a set of projects and outputs defined contractually with investors or third-party funder. This approach requires to define and monitor a set of Key Performance Indicators (KPIs) to ensure achievements of the objectives of the project. Programme-based ALDRPs adopt a budget support approach and allow to pool proceeds with the national budget dedicated to funding adaptation investments, leaving the country responsible for the strategic allocation of the funds. Compared to a project-based approach, a programme-based approach strengthens the beneficiary country ownership of its adaptation agenda. It enables to be flexible in the use of proceeds, which has often proved to be the most effective type of foreign aid intervention⁴⁷. The monitoring of projects can also be less demanding

⁴⁶ Steele, P. and Patel, S. (2020)

⁴⁷ Ibid.

and expensive, considering it does not require to develop KPIs and a reporting structure specifically for the funded projects⁴⁸, as is the case with project-based swaps. A programme-based approach is best fit for countries with strong governance structures and better than average adaptation plans, to mitigate concerns over use-of-proceeds and ensure the relevance of the projects they fund with regard to adaptation challenges⁴⁹.

For countries with less administrative and institutional capacity, project-based swaps should nonetheless be designed in a way to enable as much country's ownership as possible. In recent occurrences of DFN swaps in Belize, Barbados and the Seychelles, for instance, trust funds were set up to allocate the proceeds of the swaps to NGOs and other entities responsible for implementing nature-based projects. These trust funds are independent legal entities, with a minority government representation in the boards and a majority of NGO, academia and private sector representatives. This entails a lack of ownership of the country and impedes its administration to gain capacity over adaptation funding and overall challenges. The proceeds of project-based ALDRPs should rather be managed directly by the country's administration. They can be ring-fenced through setting up a separate account within the national treasury. Rules and conditions as well as the system to monitor the use of funds can be defined as part of the funding agreement with the intermediary NGO or directly with the creditors (cf. point 4 of this section "What financial structure for ALDRPs?").

Projects financed with ALDRPs should maximise the impact on (fiscal) resilience and GDP. As already argued, this is a key element to make ALDRPs relevant as financial operations but also to incentivize investors to take up such tools. As Figure 9 shows, average economic benefits from different types of adaptation interventions can be significant. Adaptation needs are however highly context and geography specific, and the most relevant interventions will therefore vary across countries. They mostly relate to water supply, flood protection and agriculture in Sub-Saharan Africa, Latin America and the Caribbean, while they are driven by infrastructure and agriculture in South Asia⁵⁰. A country beneficiary of an ALDRP should implement a preliminary assessment of the most important climate-related risks it is facing and select the interventions which can yield the strongest benefits. However, giving the priority to such projects should not undermine democratic accountability and public understanding of the use of proceeds. The selection of projects should therefore be transparent and debated within the national institutional settings.

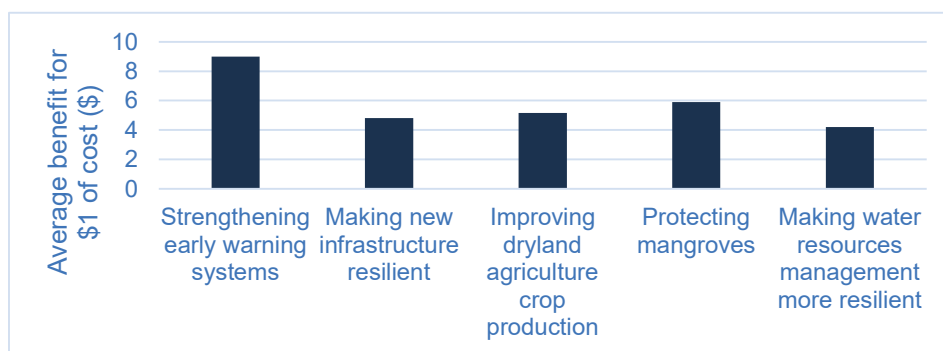


Figure 9: Average benefit of different types of adaptation interventions for \$1 of cost.
Source: Global Commission on Adaptation. 2019. *Adapt now: a global call for leadership on climate resilience.*

⁴⁸ Chamon, M. et al. (2022)

⁴⁹ Ibid.

⁵⁰ Tall, A. et al. 2021. Enabling private investments in climate adaptation & resilience: current status, barriers to investment and blueprint for action, World Bank and GFDRR

Once the most relevant interventions have been identified, the proceeds of an ALDRP should be used to finance non-bankable and near-bankable projects. Most adaptation investments are non-bankable given their public good character. ALDRPs, as they free up fiscal space, provide an opportunity to finance such investments. Some adaptation investments requiring public intervention can however be partially taken up by private investors in blended finance schemes (e.g. layered capital structures, with first loss structures assigned to public funds) or by specific revenue-enhancing interventions (e.g. tax break), allowing to scale up overall financing dedicated to adaptation. A preliminary assessment of the bankability of potential projects is therefore needed in the process of an ALDRP. Table 8 below provides examples of bankable and non-bankable projects relevant to the five intervention types highlighted above. A minimum share of the proceeds of an ALDRP can be sanctuaried for co-financing in the adaptation funding agreement (cf. point 1.D of this section “What financial structure for ALDRPs?”), as has been done as part of a DFN swap with Poland in 1991⁵¹.

Table 8: Bankability profile and examples of schemes to attract private finance for different types of adaptation interventions		
Type of intervention	Bankable projects	Non bankable projects
Strengthening early warning systems	Invest in developing a commercial service providing early warning information on (lack of) rainfalls to farmers	Invest in developing a regional early warning system for floods
Making new infrastructure resilient	Invest in the development of climate-resilient buildings	Invest in building seawalls Invest in public infrastructure (roads, dams...) to make them resilient to climate-related events
Improving dryland agriculture crop production	Invest in the development of technological solutions for dryland agriculture	Invest in research on developing climate-resilient agriculture techniques
Protection of mangroves	N/A	Invest in community-based mangroves management projects
Making water resources management more resilient	Invest in climate-smart irrigation systems	Invest in the development of climate-proof public water management systems

Source: authors

ALDRPs should be bundled with Official Development Assistance (ODA) or NGO support interventions, and partially finance support activities. Adaptation projects require strong institutional capacity, staff expertise and adequate information systems to conduct preliminary assessments as highlighted above and to monitor implementation. These may be lacking or insufficient in certain LICs and LMCs. ALDRPs should therefore be accompanied by ODA or NGO interventions aimed at providing support in projects implementation,

⁵¹ In 1991, several Paris club countries decided to swap part of their holdings of Poland's sovereign debt, allowing Poland to finance an Ecofund dedicated to the protection of the environment.

Vaysset, G. 2022. Conversion de dette pour la protection de l'environnement : l'exemple de l'Ecofonds polonais, Revue d'Economie Financière.

and part of the proceeds of the swap should finance such support activities. Involving a development bank or a recognized NGO in such programmes can contribute to reassure private actors seeking some reliability of adaptation outputs, and therefore incentivise them to contribute. The following types of interventions appear particularly relevant:

- Assistance in identifying adaptation interventions which may yield the strongest economic and resilience benefits (cost-benefit analyses)
- Assistance in assessing bankability profile and potential of most relevant adaptation interventions
- Assistance in structuring blended finance schemes
- Assistance in developing KPIs, information and monitoring systems, and evaluation frameworks for adaptation projects and climate risks, and in monitoring KPIs through the course of the implementation of adaptation projects

A few initiatives by development and climate institutions can also be leveraged as part of ALDRPs to address these challenges. The African Development Bank is already developing standardized metrics to assess adaptation benefits through the Adaptation Benefits Mechanism. The Dutch Fund for Climate and Development, through its Origination Facility, works towards identifying bankable and near-bankable adaptation projects. KPIs for monitoring adaptation projects and their effectiveness have been developed by several organisations, such as the Adaptation Fund or the World Bank.

Key takeaways

- The beneficiary country should have strategic and operational decision making over the use of proceeds of ALDRPs, to enable country ownership and foster local capacity
- Programme-based ALDRPs should be favored when conditions allow (relatively strong governance and institutional capacity, qualitative adaptation planning...)
- Priority should be given to projects which can yield the strongest economic and resilience benefits to have the strongest impact possible on macro-fiscal resilience and to incentivise private creditors to take part in the ALDRP
- Priority should be given to non-bankable and near-bankable projects through dedicated schemes (blended finance schemes...)
- ALDRPs should be bundled with ODA/NGO interventions targeted at supporting adaptation projects

D. What financial structure for adaptation-linked debt relief programmes?

ALDRPs can involve swapping existing debt with another debt at better terms, or restructuring an existing debt to improve its terms. Many financial structures are possible and details will be *ad hoc*, based on specific local configurations and conditions. We highlight below generic financial structures compatible with a budget support approach (cf. point 1.B of this section).

If an ALDRP is conducted on privately-held bonds (or commercial banks loans, even though this asset class is less likely to be leveraged in ALDRPs than bonds), a third-party or the indebted country borrowing from a third-

party (usually an NGO, but other institutions such as development banks could act as third-party in such programmes) can implement a debt buyback operation in which it buys back its current debt through issuing new debt with lower principal and potentially preferential terms. If the country is at a relatively high risk of debt distress or in default, its bonds will be traded at a significantly lower price than face value (or the present value will be significantly lower than par value in the case of loans). The country can take advantage of this situation to conduct a debt buyback⁵². Buying back bonds at or around market value (or loans at present value) would allow the beneficiary country to benefit from a discount. To finance the purchase, a third-party can loan money to the beneficiary country through emitting a new bond with lower principal and marketed as adaptation-linked. This bond should, in most cases, be enhanced (cf. a few paragraphs below). Bonds tied to green projects (such as adaptation-linked bonds) are usually oversubscribed by investors, and therefore offer a strong opportunity for attracting private investors to ALDRPs, and potentially for the country to benefit from a *greenium*. The loan provided to the beneficiary country by the third-party can be provided at preferential terms via ODA or NGO financial support (which could e.g. take on part of the interest expenses). Part of the relief from which the country benefits should then be allocated to adaptation investments through additional finance to the relevant ministry. Figure 10 summarizes this financial structure.

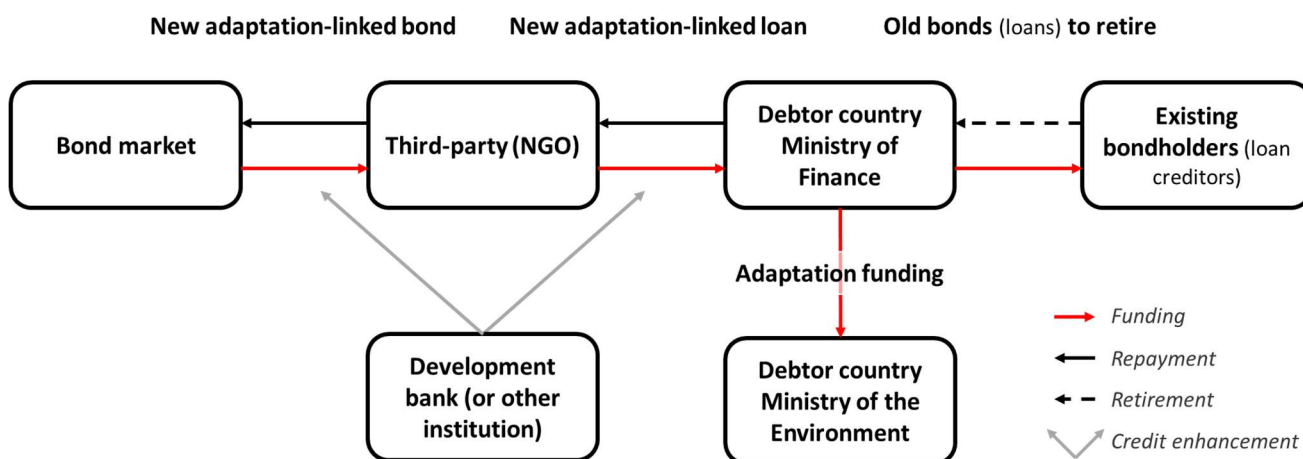


Figure 10: Possible generic financial structure for ALDRPs involving privately-held bonds (or potentially loans instead of bonds)

If the programme involves bilateral creditors, a debt exchange is not required since an adaptation-linked bond is not needed to incentivize public creditors to take part in the scheme. Any type of restructuring reducing the debt present value (haircut, interest rate decrease, grace period...) can be used, dedicating part of the proceeds to adaptation investments. This can also entail lower transaction costs than a debt exchange. Figure 11 summarizes this financial structure.

⁵² If the country has already entered in negotiation with creditors, this debt buyback can be conducted via a direct agreement with them. If not, a debt buyback at market price on the secondary market can be envisaged. It may be better in the latter case for a third-party to directly buy back the debt on the market rather than lending to the debtor country to do so, since market players may not realise that a buy back is taking place if a third-party organisation is conducting purchases on the market, while they may if the debtor country does so (and would therefore increase the price).

Adaptation-linked bonds issued as part of ALDRPs with private bondholders (or commercial banks) do not seem eligible to certification as “green bonds” by institutions like the Climate Bonds Initiative, which would have strengthened their attractiveness.

It is indeed the decrease in debt service enabled by the whole programme which enables to finance adaptation investments, and not the proceeds of the bonds issued as part of the ALDRPs themselves. An initiative could however be envisioned to label bonds issues as part of ALDRPs (cf. point 2 of this section “Further recommendations for scaling up ALDRPs”).

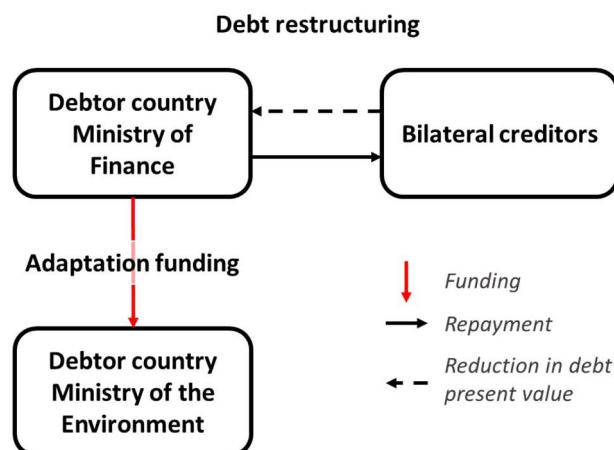


Figure 11: Possible generic financial structure for ALDRPs involving bilateral debt

Credit enhancements to adaptation-linked bonds (or loans) resulting from ALDRPs appear as “game changers” to attract private investors when there are doubts on the macro-fiscal resilience of the country. Investors may be reluctant to hold adaptation-linked bonds on countries with high risk of debt distress. Credit enhancement is key, in such situations, to strengthen their buy in. For instance, (partial) default risk insurance or guarantee, or collateralization can partially alleviate the risk for investors. The Blue Bond resulting from the DFN swap over Belize’s debt closed in 2021 attracted investors only after the US Development Finance Corporation agreed to insure it. Credit enhancement in the form of collateral (US Treasury bonds and cash) was also key to incentivising private banks to take part in debt relief programmes under the Brady plan⁵³. Credit enhancements – which are needed only when perceived riskiness of the country is high - have been highlighted in Figures 10 and 11 describing financial structures for ALDRPs involving privately-held bonds and commercial banks loans. Moreover, credit enhancements may be hard to secure when an ALDRP is applied to a large amount of debt. A collective initiative may be needed to alleviate this barrier (cf. point 2 of this section “Further recommendations for scaling up ALDRPs”).

“The expenditure commitment must be senior to the remaining debt service”⁵⁴ for an ALDRP to dominate an unbundled alternative of adaptation-linked concessional finance and debt relief. Concessional financing by a development institution is disbursed only if the targeted investment takes place, and can therefore not be diverted to debt service. For an ALDRP, the relief takes place prior to the adaptation investments, which are committed to be implemented in the future. If fiscal space is constrained, the debtor may use the relief to finance debt service instead of adaptation investments. These must therefore be made senior to the remaining debt service to ensure adequate use-of-proceeds. Moreover, this allows to make non-participating creditors indirectly contributing to finance the swap through higher losses in the event of a crisis,

⁵³ Griffith-Jones, S. et al. 2021. Debt relief by private creditors: lessons from the Brady plan, Debt Relief for green and Inclusive Recovery Project, Background paper 7

⁵⁴ Chamon, M. et al. (2022)

and therefore lower present value of their claims⁵⁵. Sufficient leeway should however be granted to the beneficiary country to use the proceeds of the ALDRP for other ends than adaptation under extreme conditions, such as following a natural catastrophe or other high-impact events requiring emergency interventions and financing.

As the IMF highlights, the swap concluded over Belize's public debt in 2021 potentially achieved seniority of the expenditure commitment over remaining debt service⁵⁶. It consisted, from the point of view of the Belizean government, in swapping part of its bonds with a loan (the Blue Loan) provided by TNC at better terms than the swapped bonds. The loan was financed with a bond (the Blue Bond) issued by TNC. Belize also signed a Conservation Funding Agreement with TNC committing it to ocean protection undertakings. The Blue Bond was insured by the US Development Finance Corporation and the Conservation Funding Agreement signed between TNC and Belize had a cross-default provision with the Blue Loan. If the conservation payments do not take place, Belize will be considered in default on the Blue Loan, therefore calling in the guarantee. Calling in a US guarantee may be more costly, politically and economically, than failing to service its debt, therefore creating an incentive to finance the adaptation investments prior to servicing remaining debt.

An adaptation funding agreement should be signed between the debtor country and the third-party institution (or the creditors if there is no third-party). It commits the country to dedicating part of the relief of an ALDRP to adaptation in the form of a yearly budget dedicated to adaptation investments over a defined period, and highlights the conditions under which these should take place. It highlights the KPIs (including milestones), monitoring and implementing systems to be used. If the ALDRP is project-based, it describes the projects which will be financed and the amounts dedicated to each of them. If it is programme-based, the funding agreement should describe the adaptation programmes (objectives..) to which the funding derived from the ALDRP will contribute.

Key takeaways

- To attract private bondholders (or loan creditors) to ALDRPs, one can partially replace existing claims with adaptation-linked bonds through a debt buyback
- Credit enhancement to bonds issued as part of ALDRPs is key, if not a must-have, to attract private investors to such programmes when there are doubts over the beneficiary country macro-fiscal perspective
- Market value of bonds or present value of loans can constitute a point of reference for pricing ALDRPs, especially when it involves private creditors

⁵⁵ Ibid.

⁵⁶ Ibid.

2. Further recommendations for scaling up adaptation-linked debt relief programmes

Several international institutions and bodies could roll out initiatives and develop tools, metrics and incentives for private actors to take part in ALDRPs. It is clear that a debt crisis is pending in many LICs and LMCs and that climate change will likely impact their solvency in the future if they are not able to adapt. Collective actions are therefore needed to fully and swiftly develop the potential of ALDRPs, especially through leveraging debt owned by private actors, which have yet to scale up their contribution to debt relief programmes of developing countries and to adaptation finance. We identified nine actions and initiatives that can contribute to do so. Some recommendations can be helpful to scale up adaptation investments in general in LICs and LMCs or can also be relevant to scaling up other nature-linked debt relief programmes than ALDRPs.

- **Developed countries could incentivize private financial institutions to contribute to ALDRPs.** Several countries implemented fiscal and regulatory incentives for banks to take part in debt relief programmes as part of the Brady plan at the turning point of the 1990s⁵⁷. This could inspire a global attempt to scale up ALDRPs. Global North countries could reduce or suppress provisioning requirements for bonds issued as part of ALDRPs, or reduce tax on interest income and capital gains from sales of such bonds.
- **Bodies grouping bilateral and private creditors to LICs and LMCs could provide guidelines regarding the implementation of ALDRPs in an attempt to standardize them.** The Paris Club, potentially along with non-Paris club creditors such as China, could provide guidelines for ALDRPs involving bilateral creditors. A group of private creditors or an international body representing private creditors (such as the London Group, International Capital Markets Association or Emerging Markets Investors Alliance, or a collaborative initiative of several of these) could do so for ALDRPs involving private creditors. Such guidelines could include developing a framework and recommendations for structuring ALDRPs, highlighting procedures, documentation and contracts' clauses to use, providing guidance regarding how adaptation investments should be monitored...
- **Aid donor and recipient countries as well as development banks and relevant international and private organisations could foster the development and convergence of metrics and protocols to monitor adaptation outcomes.** Streamlining metrics for monitoring adaptation projects would lower transaction costs of ALDRPs and incentivise private creditors to take part. Such a collaborative initiative would build on the experience of institutions that have already engaged in developing adaptation metrics and protocols, such as the Adaptation Fund or the World Bank.
- **Development banks and trust funds could publicly state their will to support the development, implementation and monitoring of adaptation projects resulting from ALDRPs. Development banks, and first of all the Multilateral Investment Guarantee Agency of the World Bank, could publicly state their interest in providing credit enhancement as part of ALDRPs.** This would send a positive signal to both debtor LICs and LMCs and creditors, incentivising them to consider ALDRPs.

⁵⁷ Volz, U. et al. (2021)

As already mentioned, credit enhancement may be hard to secure for ALDRP on large amounts of debt. Collective provision, by several development banks and institutions, of credit enhancements as part of ALDRPs could enable to circumvent this obstacle and therefore contribute significantly to scaling up such tools.

- **The development community could develop a global, publicly-available database highlighting the benefits, KPIs, monitoring and information systems, achievements, and potential blended finance schemes used for ODA-funded adaptation projects.** This repository tool would enable to assess the track record of different types of adaptation interventions, and would provide an evidence base of success stories. These could then inspire and be adapted to adaptation interventions funded as part of ALDRPs (and through other means). It could be conducted through a collaboration of donor countries, development banks and relevant trust funds around the globe under the premise of the OECD Development Assistance Committee. It would build on already existing databases, such as the Climate Funds Update database which provides data on projects funded by multilateral climate change funds (including but not restricted to adaptation projects). The Adaptation Fund also provides a list of the adaptation projects it has financed and attaches some information to it.
- **The newly created G20 Common Framework for Debt Treatments could foster ALDRPs.** The Framework could be further enhanced by introducing adaptation investment conditions, which could then be financed through debt write-offs, two features it currently leaves aside. The Framework could also provide for the introduction of clauses in bilateral debt contracts highlighting ALDRPs as a tool for debt relief.
- **Multilateral development banks and trust funds could develop a certification of ALDRPs to attract private financing.** This certification would apply to bonds issued as part of ALDRPs and would provide quality assurance to private investors. This would palliate the inapplicability of currently-existing green bonds frameworks to ALDRPs.
- **Developing countries should require the introduction of collective action clauses (CACs) in bonds agreements.** Even if such clauses may increase borrowing cost, they can significantly reduce costs in the event of a debt crisis, through facilitating a restructuring. ALDRPs being debt restructuring operations, CACs also facilitate their implementation.
- **The IMF and World Bank should include climate risks analysis into Debt Sustainability Analyses (DSAs).** This would allow one to have a clear understanding of the (future) contribution of climate risks to debt sustainability dynamics of developing countries. DSAs should also include an analysis of the investments required for the country to adapt to climate change and enhance macro-fiscal resilience to climate risks. As the IMF usually plays a central role in debt restructuring operations, such analyses could provide a basis for implementing ALRs.

Country example: implementing an adaptation-linked restructuring of Ghana's public debt

Ghana is, as of early 2023, facing a deep public debt crisis. While it was described as Africa's economic success by the international community, enjoying strong economic growth during the 2010s, the recent international shocks of Covid and the Ukraine war combined propelled an already slow-building crisis. Tax reductions and spending increase already led to an increase in the-debt-to-GDP ratio prior to the Covid crisis, which put an additional burden on debt and GDP. The Russia-Ukraine war was the final blow. Global prices increase translated in Ghana into hyperinflation and currency devaluation, which mechanically increased its external debt burden. The country started seeking financial support from the IMF, as its debt was soaring up (cf. Figure 12). As of beginning of 2023, it is meant to receive \$3 billion of support from the IMF conditional on a comprehensive restructuring of its debt.

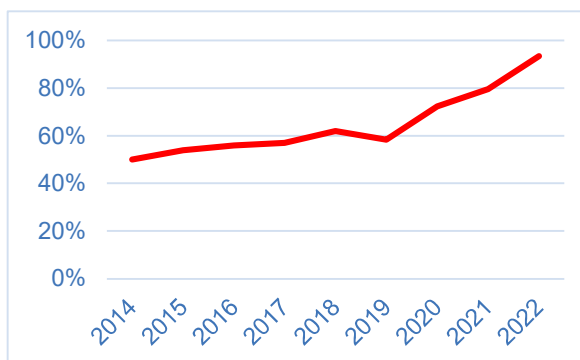


Figure 12: Public debt-to-GDP ratio of Ghana. Source: IMF, World Economic Outlook and Bank of Ghana. 2023. Summary of Economic and Financial data - January 2023

Ghana is ranked 111 out of 182 by the Notre-Dame GAIN index for its resilience to climate change.

The country is severely exposed to floods, droughts, storms and sea level rise. Currently, annual losses due to droughts and floods are estimated to be, in average, \$200 million, which is expected to rise to \$525 million by 2050 under a conservative estimate. Rising temperatures will also reduce crops yields. Cocoa yields in Ghana are expected to decrease by 5.5%, negatively impacting the generation of hard currency through exports of cocoa, which is the second most important Ghanaian sector generating hard currency (after fossil fuels). Labor productivity may also decline by 8.5% under a high emission scenario. These evolutions will negatively affect the country's fiscal space, pushing up financing needs and pressuring down GDP growth and financial resources. Beyond economic impacts, human health will also be strongly jeopardized if the country fails to adapt to climate change. Ghana will likely experience near-unliveable conditions after 2050 under a business-as-usual scenario, due to a combination of increased temperature levels and humidity.⁵⁸

Freeing up fiscal space and investing in climate change adaptation of Ghana are therefore two important and intertwined objectives. This can be done through an ALR. In its Intended Nationally Determined Contribution, Ghana estimated its financial needs to adapt to climate change at \$12.79 billion for the period 2020-2030 (cf. Table 9). This represents about one fourth of its total public debt as of beginning of 2023, and one third of its external debt.

⁵⁸ The World Bank. 2022. Ghana Country climate and development report.

Table 9: Adaptation investment needs of Ghana

INDC Policy Actions	Investment needs (billion \$)
Agriculture resilience building in climate vulnerable landscapes	3.2
Value addition-based utilization of forest resources	1.3
City-wide resilient infrastructure planning	3.6
Early warning and disaster prevention	0.4
Managing climate-induced health risks	1.4
Integrated water resources management	1.9
Resilience for gender and the vulnerable	1

Source: Republic of Ghana. 2015. Ghana's intended nationally determined contribution (INDC) and accompanying explanatory note

We modelled a fictional scenario for Ghana's public debt dynamic under a very simple ALR taking place at the end of year 2022. We used the newly-created Public Debt Dynamics Tool of the IMF. We modelled a debt buyback of Ghana's Eurobonds at 60 cents on the dollar. Ghana's Eurobonds lost about 50% of their market value over the course of 2022 amid fears of a default, with most traded at around or below 40 cents on the dollar at the end of 2022⁵⁹. The country is rated in Selective Default on such bonds by Standard's & Poor. Ghana's Eurobonds investors may therefore be willing to accept a 40% discount on face value. Belize's swap involved a debt buy back at 55 cents on the dollar while the concerned bond was traded at 38-47 cents on the dollar⁶⁰. The fictional ALR also includes a restructuring of Ghana's bilateral debt (Paris club and non Paris club) under the same terms, a discount of 40% on face value. A restructuring of Ghana's bilateral debt appears as a plausible scenario, since the country has, as of beginning of 2023, requested a restructuring under the G20 Common Framework. We consider that multilateral debt and bank loans do not integrate the restructuring since they are usually not included in such programmes, the former because it is senior to all other types of debt, the latter because banks are usually reluctant to participate in sovereign debt restructurings. We consider that half of the relief is redirected towards investments in adaptation. We provide more details on the model used and underlying data in the Annex.

Providing a 40% discount on Ghana's face value bilateral debt and Eurobonds at the end of 2022 would have enabled a decrease in Ghana's debt from 93.5% of GDP (cf. Table 7) to 80.5%. Ghana has \$13 billion of Eurobonds issues, of which a \$1 billion bond is partially guaranteed by the World Bank and is traded at a much higher price than the other \$12 billion of bonds⁶¹. We therefore leave aside this \$1 billion from the fictitious ALR (no significant discount can be obtained through buying back this bond). We estimate that bilateral debt remained constant since end of 2021, at \$3.2 billion⁶². A 40% discount on \$15.2 billion of debt therefore results in a decrease of about \$6 billion, or about 13% of Ghana's 2022 GDP at the end of 2022 prevailing exchange rate.

⁵⁹ Akorlie, C. (Reuters). 2023. Ghana says domestic debt swap closed with 85% participation.

⁶⁰ The Nature Conservancy. 2022. Case study – Belize debt conversion for marine conservation.

⁶¹ Savage, R. and Jones, M. (Reuters). 2022. Explainer: who holds Ghana's debt and what restructuring is planned?

⁶² Ibid.

When it comes to the debt sustainability impacts of the ALR scenario, the main variable we look at is the constant primary balance needed to achieve a public-debt-to-GDP ratio of 57.1% in 2028. This public debt-to-GDP ratio is considered by Awadzie et al. (2022)⁶³ as the ratio above which per capita economic growth in Ghana is “considerably retarded”. Such a fictitious ALR on bilateral debt and Eurobonds would enable Ghana to run a primary deficit of up to 3.9% every year until 2028 and still meet the 2028 target, against a deficit of up to 2.8% in the baseline scenario involving no ALR⁶⁴ (Figure 13). The programme therefore significantly frees up fiscal space.

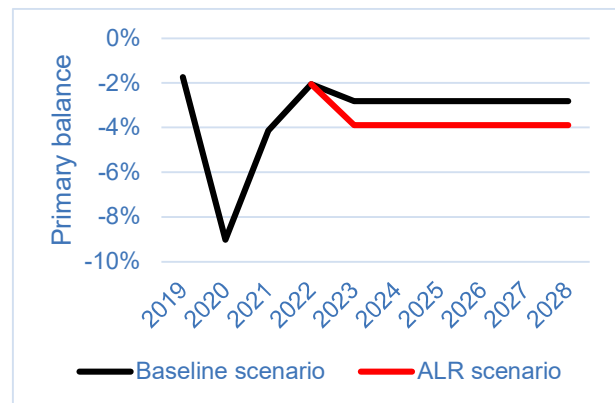


Figure 13: Ghana's constant primary deficit compatible with achieving a debt target of 57.1% in 2028 under a baseline and ALR scenarios

Such an ALR would also free up about \$3 billion for adaptation investments, which is about 25% of the adaptation investment needs of the country for the period 2020-2030. Ghana has budgeted \$4.2 billion to finance adaptation projects on its own funds and relies on international public and private sources for the remaining \$8.59 billion⁶⁵. Such an ALR would therefore cover about 40% of international funding needs for adaptation. It could for instance fully finance the development of a disaster early warning system and contribute to strengthening the resilience of agriculture to droughts and floods, as these investments can yield significant economic benefits (cf. Table 8).

⁶³ Awadzie, D. et al. 2022. The relationship between economic growth and public debt: a threshold regression approach in Ghana, *Journal of Business, Economics and Finance*, 11, 1.

⁶⁴ Note that we do not take into account, in the ALR scenario, the effects of the adaptation investments unleashed by the ALR on Ghana's solvency.

⁶⁵ Government of Ghana. 2021. Nationally determined contributions implementation plan – Financing strategy.

Section 3: will we eventually need to reform the international monetary system?

ALDRPs can prove very useful to tackle the intertwined climate and financial vulnerabilities of countries. However, nature-linked debt relief programmes have been criticized for several reasons. Their lack of transparency, negotiations being held in secrecy because bond markets are sensitive to new information, undermines democratic decision making. Tax havens have been used as part of the financial structure of such deals, and the use of trust funds independent of the local administrations has been criticized for undermining government control over the proceeds of such tools. Conservation objectives may also conflict with other national development priorities, such as health or education⁶⁶.

Moreover, ALDRPs remain crisis management tools and cannot by themselves be sufficient to provide the full means for jointly addressing the intertwined challenges of climate and financial vulnerabilities of developing countries. Structural financial constraint, and increasingly climate vulnerability, cross over from and into the deficiencies of the international monetary system, which relates to the set of rules, practices and institutions governing international financial flows and the exchange of currencies between nations. ALDRPs do not address such deficiencies. A reform of the international monetary system may therefore eventually be needed. This section explores this hypothesis, but deeper research is needed to refine and make a compelling case for it.

1. Why is the international monetary system not fit for tackling the challenges associated with climate change impacts?

The current international monetary system suffers from deficiencies which hamper adequate business cycle management by developing countries. Capital flows to developing countries are mostly driven by exogenous factors⁶⁷, such as the interest rate set by the US Federal Reserve, and largely disconnected from domestic economic conditions⁶⁸. Developing countries are “business cycles takers”. Their ability to conduct countercyclical policies is therefore highly limited, since inward and outward flows are largely based on factors they do not control. Their financial markets being shallow, a slight increase in capital profitability in a developed country may leave a developing country starving for fresh money.

Moreover, the existing international financial safety net available to developing countries to manage crises resulting from busts is thin. For instance, many developing countries are excluded from swap

⁶⁶ See for instance Coalition for Fair Fisheries Arrangements. 2022. Financing the 30x30 agenda for the Oceans : debt for nature swaps should be rejected.

⁶⁷ Svartzman, R. et Althouse, J. 2020. Greening the international monetary system? Not without addressing the political ecology of global imbalances, Review of international political economy

⁶⁸ Ibid.

networks⁶⁹ between central banks, which are restricted to developed and some emerging countries. This favors the accumulation of reserve currencies (so-called hard currencies - especially the US dollar but also the euro, the British pound or the yen), by developing countries to face down cycles: they use their reserves to maintain liquidity of the local currency in times of crisis. This can fuel global imbalances: reserves in hard currencies are reinvested in hard currency countries instead of being exchanged against local currencies, maintaining exchange rate undervaluation of countries accumulating hard currency reserves and fueling potentially unsustainable capital inflows in hard currency countries.

Finally, there is no institutionalized international debt workout mechanism. Debt restructurings of countries in debt distress rely on voluntary participation of creditors and incentives to take part are thin. This results in an insufficient restructuring of developing countries' debts when they are in distress. Debt restructurings are also often implemented in an untimely manner, after a crisis already had a significant detrimental impact on economic and social outcomes⁷⁰.

Yet, climate change impacts will strengthen the macroeconomic instability of developing countries. They will put weight on growth, reducing the size of upward cycles, and will trigger strong negative macroeconomic shocks. The case of the 2022 flood in Pakistan – largely attributable to climate change⁷¹ - provides an interesting example of what we are likely to see more and more in the future. It resulted in a loss of \$40 billion (12% of GDP)⁷² and destructions triggered created a weight on long-term growth⁷³, aggravating an already unsustainable debt situation⁷⁴. Destructions of crops have forced the country to increase its trade deficits to import food, pressuring down hard currency reserves and the rupee. Government spending increased to face the adverse effects of flooding. This pushed up external debt levels, which eventually led the country to call its creditors for a debt relief plan.

The impact of climate change will therefore put more pressure on developing countries, and the above-mentioned deficiencies of the international monetary system are likely to be felt even more.

- Strengthened macroeconomic volatility due to climate change will likely be enhanced by financial procyclicality. Relatively small financial markets make developing countries highly vulnerable to sudden capital outflows – so-called capital flights. A negative climate event could trigger a capital flight⁷⁵, leading to a drying up of financing and causing a liquidity crisis.
- Increased macroeconomic instability due to such impacts will likely result in developing countries trying to accumulate more hard currencies, which would further fuel global imbalances.

⁶⁹ Swap networks are reciprocal credit lines between central banks allowing them to exchange currencies and maintain liquidity in the currency market.

⁷⁰ Ocampo, J. 2017. Resetting the international monetary (non)system, OUP Oxford

⁷¹ World Weather Attribution. 2022. Climate change likely increased extreme monsoon rainfall, flooding highly vulnerable communities in Pakistan.

⁷² Bin Javaid (Aljazeera). 2022. Pakistan flood losses estimated at \$40bn: Ex-finance minister.

⁷³ Mangi (Bloomberg). 2022. Pakistan forecasts economic growth to halve following floods.

⁷⁴ Mangi (Bloomberg). 2022. Pakistan currency-crisis odds exceed 50% as floods undo progress.

⁷⁵ Svartzman, R. et Althouse, J. (2020)

- Increased climate change impacts will likely be a catalyst of debt distress, through both their negative impacts on GDP and the need of developing countries to borrow and invest to rebuild infrastructures after a negative climate event and to adapt to climate change. Consequently, the lack of an efficient debt workout mechanism is likely to be felt even more.

The international monetary system also hampers adaptation investments in developing countries.

Adaptation investments are characterized by their public good characteristic. They mostly feature non-appropriable benefits which make the government, as opposed to the private sector, the main institution to implement such investments. But government finance of developing countries is inhibited by the deficiencies of the international monetary system:

- Hard currencies are highly liquid and stable as they are considered safe by investors. On the contrary, soft currencies of developing countries are rarely accepted internationally and are highly volatile and illiquid. This results in the need for developing countries governments to borrow in hard currencies and compensate for the risk associated with the volatility of their currency by offering higher interest rates on their debt⁷⁶. High interest rates are particularly detrimental to adaptation investments, which feature indirect and long-term benefits and may therefore appear insufficiently profitable.
- Capital flows to developing countries are mostly driven by exogenous factors and largely disconnected from domestic economic conditions. As a consequence, developing countries lack the financial autonomy to implement long-term development plans, including climate adaptation strategies, and focus on short-term export-led strategies to acquire hard currencies in order to sustain liquidity in the event of an economic crisis and to be able to service external debt. Moreover, such export-led strategies are often relying on exports of fossil fuels, further strengthening climate change.
- Hard currencies accumulated as reserves are re-invested in hard currency-denominated assets (for instance in US Treasury bonds) and are thus unavailable to be traded against the developing country's currency to finance adaptation investments locally.

The current international monetary system is therefore not fit for properly navigating the climate crisis. Drivers of macroeconomic instability of developing countries will be further strengthened while the international monetary system performs poorly in enabling developing countries to manage up and down cycles. Moreover, strong adaptation investments are needed but are structurally hampered by the international monetary system, through some of the factors explained above. In a forward-looking sense, climate impacts will likely make a reform of the international monetary system more pressing.

⁷⁶ This relates to the 'original sin' highlighted in the introduction.

2. Potential avenues for reforming the international monetary system at a time of accelerating climate change

Numerous reforms to alleviate the deficiencies of the international monetary system discussed above are already widely discussed by experts and the scientific community. Among other options, the following set of reforms – which have been proposed by others but (some of) which we link more explicitly than previous authors to adaptation requirements of developing countries - would prove particularly useful to favor the adaptation of developing countries to adverse climate events increasing in frequency and scale. The following proposals are meant to engage the discussion, but more research is required to better explore how and what reforms of the international monetary system can contribute to foster the adaptation of developing countries to climate change.

1. Strengthen the role of the Special Drawing Rights (SDR) as a reserve currency

SDRs are an international reserve asset managed by the IMF and aimed at playing the role of a reserve currency along with national hard currencies. SDRs are allocated to IMF members on an *ad hoc* basis, usually in times of economic crisis such as in 2021, in the midst of the Covid-19 pandemic. Higher SDR allocations to developing countries would reduce the need for developing countries to hold precautionary reserves in hard currencies. This would require delinking the allocation of SDRs from IMF country quotas to enable developing countries to receive a significant share of SDRs and use them as a reserve asset.

Developing countries would be able to use the proceeds of exports not as reserves but to finance local development projects, such as adaptation projects. It would also enable developing countries to focus less on short-term, export-led development strategies aimed at acquiring hard currencies through exporting natural resources, including fossil fuels contributing to aggravating climate change⁷⁷. It would facilitate the embracement of development strategies centered on diversification, which is a central driver of long-term macroeconomic stability⁷⁸ which will be more and more at risk due to climate change impacts.

2. Enable the use of SDRs for the financing of adaptation-related projects in developing countries

Several authors already proposed to use SDRs to finance climate-related projects, but rather focusing on climate change mitigation⁷⁹. SDRs allocated to countries but unused by them could be channeled to development banks, such as the Green Climate Fund, the World Bank or the African Development Bank, to finance adaptation projects⁸⁰. SDRs would therefore contribute to macroeconomic stability both as a reserve asset and a source of funding for climate change adaptation.

⁷⁷ Svartzman, R. et Althouse, J. (2020)

⁷⁸ IMF. 2014. Sustainaining long-run growth and macroeconomic stability in low-income countries – the role of structural transformation and diversification.

⁷⁹ Aglietta, M. and Coudert, V. 2019. The dollar and the transition to sustainable development: from key currency to multilateralism, CEPII Policy Brief

Svartzman, R. et Althouse, J. (2020)

⁸⁰ As for instance Aglietta, M. et Coudert, V. (2019) and Svartzman, R. et Althouse, J. (2020) propose but for the financing of decarbonization projects.

Private funding to developing countries may become scarcer and more expensive as climate change accelerates. Climate change, especially if left unchecked, will entail “unhedgeable risks”⁸¹ and therefore strongly restrain an already limited access of developing countries to international capital. Public capital, may it be national or international, will therefore be called upon to play a more important role in the financing of these economies, and mobilizing SDRs would allow to do so while limiting the impact on governments’ balance sheets.

3. Promote the use of capital account regulations (CARs) as a tool to foster macroeconomic resilience to climate change impacts

CARs are measures to control international transactions in which a country’s residents are involved⁸². They have been found to strongly favor macroeconomic stability⁸³, limiting the amplitude of boom and bust cycles. Stronger and wider use of CARs would contribute to the resilience of developing countries to climate change impacts. They can enable to limit the scale of capital flights in the event of a negative climate impact.

4. Build an efficient sovereign debt workout mechanism

The absence of an efficient debt workout mechanism incentivizes both debtors and creditors to delay restructuring and forces debtors to adopt contractionary adjustment policies during a debt crisis⁸⁴. This results in strengthened liquidity and solvency issues, and delayed, insufficient debt restructuring.

As already shown, there is a strong correlation between the lack of resilience to climate change impact and the risk of external debt distress of developing countries (cf. Figure 8). If the causality link between the former and the latter is, up to now, unclear, climate-related shocks will likely fuel sovereign debt risk in the future⁸⁵. This will make more pressing the need to adopt efficient debt restructuring processes. If the integration of collective action clauses to sovereign bond contracts can help, the creation of an “International Debt Restructuring Court”⁸⁶ seems the most efficient way to address this issue. It should foster debt restructurings based on internationally agreed norms “regarding the priority of claims, necessary overall write-downs, and sharing of ‘haircuts’”. The Court should have the power to halt ongoing negotiations between creditors, if they cannot agree, and impose its decisions on them⁸⁷, allowing for a pre-determined timescale to be defined in order to avoid lengthy restructuring processes which are strongly detrimental to the debtor.

⁸¹ CISL. 2015. Unhedgeable risk: how climate change sentiment impacts investment.

⁸² Using controls on capital inflows and outflows, price-based and/or quantity-based

⁸³ Erten, B. et Ocampo, J. 2016. Macroeconomic effects of capital account regulations, IMF Economic Review

⁸⁴ Ocampo, J. (2017)

⁸⁵ Standard & Poor’s. 2014. Climate change is a global mega-trend for sovereign risk.

⁸⁶ Stiglitz, J. 2010. The Stiglitz report - Reforming the international monetary and financial systems in the wake of the global crisis, available at <http://www.library.fa.ru/files/Stiglitz-Report.pdf>

⁸⁷ Ocampo, J. (2017)

Conclusion

Lack of adaptation to climate change and the financial vulnerability of developing countries – particularly LICs and LMCs - strengthen each other in a doom loop. The financial vulnerability of these countries is exacerbated by the destabilizing impact of climate change. Reducing the destabilization potential of climate change in these countries requires strong adaptation investments, which are hampered by the financial constraints they face. The case for bringing together the international agendas for addressing climate vulnerability and financial challenges of developing countries, therefore, appears strong, and strengthens as climate change accelerates.

Bringing these agendas together can be done through ALDRPs. Such tools allow to link debt relief of a debtor developing country to adaptation investments, and therefore concurrently address its climate and financial vulnerabilities. Such tools are still piecemeal, unstandardized tools, which severely hamper their scaling up. This policy brief provided guidance regarding the most important aspects to consider when looking at implementing ALDRPs, in an attempt to ease and accelerate their rollout.

Despite their potential, ALDRPs, beyond posing challenges to democracy and sovereignty, do not address the structural deficiencies of the international monetary system. Such deficiencies hamper the management of up and down cycles of developing countries, which will be enhanced by climate change impacts, and constrain their investment capacity, limiting their ability to finance adaptation investments. Eventually, a reform of the international monetary system will be needed to address the climate and financial vulnerabilities of developing countries.

Annex

The modelling of the public debt dynamics of Ghana has been done with the Public Debt Dynamics Tool (DDT) of the IMF. It allows to project public debt as a percent of GDP, to compute fiscal adjustment paths to achieve a debt ratio target and to perform stress tests. It is a simple model, requiring only a few macro and fiscal variables to project public debt. The table below highlights the input variables to the model and their data sources.

Table 10.1: Data sources for populating the Public Debt Dynamics model of the IMF for projecting Ghana's public debt under the baseline and ALDRP scenario

Data	Source	Comments
Gross public debt as a share of GDP	Bank of Ghana. 2023. Summary of Economic and Financial data - January 2023	We use the Bank of Ghana data only for 2022. We use it as it is in the baseline scenario and decrease it by the size of the discount in the ALDRP scenario.
Share of foreign currency debt	World Bank and IMF, Ghana 2021 Debt Sustainability Analysis (DSA) Ghana's Ministry of Finance, 2021-2024 Medium-Term Debt Management Strategy Bank of Ghana. 2023. Summary of Economic and Financial data - January 2023	We use the share of foreign currency debt planned for 2026 and 2031 as per the 2021 DSA analysis and extrapolate linearly on 2023-2025 and 2027-2028 in both scenarios. We adjust the year 2022 share of foreign currency debt in the ALDRP scenario to account for the change in the debt structure.
Nominal exchange rate	IMF, WEO Yahoo finance	We use the 2027 implied purchasing power parity exchange rate of the Ghanaian cedi with the US dollar and the euro and extrapolate linearly for years 2023-2026. Because debt in US dollar and euro make up about 90% of Ghana's foreign currency public debt in 2022, we did not take into account the evolution of the exchange rate with other foreign currency debt.
Nominal interest rate on local currency debt	World Bank and IMF, Ghana 2021 DSA (real interest rate forecast) IMF, WEO (inflation forecast)	We projected the nominal interest rate on local currency debt adding inflation to the real interest rate. We then divided these figures by two to approximate the effect of the restructuring of Ghana's public debt held domestically, which took place in Q1 2023.

Table 10.2: Data sources for populating the Public Debt Dynamics model of the IMF for projecting Ghana's public debt under the baseline and ALDRP scenario

Nominal interest rate on foreign currency debt	World Bank and IMF, Ghana 2021 DSA	We do not model a change in the nominal interest rate on foreign currency debt in the ALDRP scenario because we do not have access to data on interest rates of the various types of foreign currency debt to do so. The nominal interest rate should most likely decrease in the ALDRP scenario considering the main component of Ghana's external debt is Eurobonds, which are included in the modelled ALDRP and which are likely to bear a higher interest rate than bilateral and multilateral debt. Our estimation is therefore rather conservative.
GDP deflator	IMF, WEO	NA
Real GDP growth	IMF, WEO	We decrease the planned yearly real growth rate compared to the WEO by 1% in both scenarios, to account for the multiplier effect, considering that achieving the targeted debt ratio in 2028 will require fiscal adjustment.
Primary balance	IMF, WEO	We used the IMF, WEO primary balance of Ghana only for year 2022. The projected primary balance needed to achieve the targeted debt ratio is calculated by the model