



# Protecting against sovereign debt defaults under growing climate impacts

## Role for parametric insurance

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The Climate Change Group works with partners to help secure fair and equitable solutions to climate change by combining appropriate support for adaptation by the poor in low- and middle-income countries, with ambitious and practical mitigation targets. The work of the Climate Change Group focuses on achieving the following objectives:

- Supporting public planning processes in delivering climate-resilient development outcomes for the poorest
- Supporting climate change negotiators from poor and vulnerable countries for equitable, balanced and multilateral solutions to climate change
- Building capacity to act on the implications of changing ecology and economics for equitable and climate-resilient development in the drylands.

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The climate crisis is pushing Least Developed Countries into over-indebtedness, amplifying their disparity with developed countries. Fundamental changes are needed to re-engineer, regulate, and equalise global debt and growth. Parametric insurance for sovereign debt can be one of the sustainable options for resolving the debt crisis. Insurance could cover debt repayment on behalf of the country during the period of climate crisis, helping them to focus their budget on relief and recovery, with the provision of a global fund to cover the insurance premiums.

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# Summary

Rising sea levels have submerged many coastal areas; floods are increasing in magnitude and breaching barriers, destroying lives, livestock and property; and more intense and frequent cyclones are leaving communities unable to protect themselves. This loss and damage, driven by climate change, is often felt most acutely by Least Developed Countries (LDCs) and Small Island Developing States (SIDS). Yet such countries have limited capacity, resources and infrastructure to invest in climate resilience. This paper provides evidence that climate impacts are pushing LDCs and SIDS into over-indebtedness, undermining their ability to deal with climate impacts and focus on long-term resilience. It suggests parametric insurance of sovereign debts as one of the practical and viable options to manage the debt crisis.

## Key findings

LDCs are more vulnerable to the effects of climate change due to their low levels of development, weak infrastructure, and reliance on agriculture and natural resources for income. As the intensity and frequency of extreme events keeps increasing, these countries are more exposed to them every year. Each time, their response creates more debt, undermining capacity for the next crisis. They thus become trapped in an unsustainable debt cycle.

Our analysis shows that countries with a higher Hazard and Exposure Index are likely to have a higher sovereign default to debt ratio. The average default to debt ratio of 30 LDCs considered for analysis is 3.45 with an average Hazard and Exposure index of 4.16. The predicted values of regression modelling shows that a Hazard and Exposure Index of 10 can increase the chances of debt default for LDCs to 11.07 with countries like Niger, Myanmar, Sudan, Mozambique, and Mali most at risk. This is higher for LDCs compared to developed and developing countries.

Climate vulnerability also has significant implications for sovereign borrowing costs. For credit-rating agencies, higher climate risks create a greater risk of default. This raises the cost of capital for climate-vulnerable countries and threatens debt sustainability. Consequently, poorer countries exposed to climate impacts have to bear the additional burden of higher interest rates.

This financial burden exacerbates the present-day economic challenges of poorer countries. The magnitude of this burden is expected to at least double over the next decade. These credit-rating

downgrades can be expected to increase the cost of public borrowing, making it more expensive to make investments in recovery or building resilience for future impacts.

The increased public default to debt ratios undermine the ability of LDCs to finance investments in social protection programmes such as poverty reduction, livelihood security, food, nutrition, health and education. Resources needed to respond to the climate crisis, the COVID-19 pandemic and other national needs are increasingly being diverted to debt repayments.

Our analysis shows that countries with a higher sovereign default to debt ratio are likely to spend less on social assistance. The 27 LDCs considered for this analysis have an average default to debt ratio of 3.53 with average social assistance spending of 0.82% of GDP. In the case of LDCs, the projected regression value shows that social assistance spending decreases to 0.14% of GDP when the sovereign default to debt ratio is 10. The degree of negative association is particularly stark in the case of LDCs compared to developed and developing countries.

These diversions can have social impacts: without strong safety nets, the most vulnerable may not have adequate mechanisms to cope. LDCs already have lower ratings on human development, and economic and environmental vulnerability. They represent around 90% of the countries with poverty rates higher than 40% in 2021. Further reductions in social spending can thus have long-term negative impacts on human development indicators in LDCs, such as poverty, education and health outcomes.

Debt restructuring efforts are limited, postponing rather than cancelling debt payments, and making future recovery even more difficult for these countries. The role of climate finance is also under question. In 2020, out of US\$68.3 billion of climate finance provided by developed countries, 71% or US\$48.6 billion was in the form of loans (including both concessional and non-concessional).

Around half of climate finance provided to SIDS in 2017–2018 took the form of loans, which added still more debt. Furthermore, all SIDS received a combined US\$1.5 billion in climate finance between 2016 and 2020. But in the same period, 22 SIDS paid more than US\$26.6 billion to their external creditors — almost 18 times as much as they received in loans.

## What can be done to ensure sustainable debt servicing.

High sovereign debts can lead to reduced investment in social protection and resilience building. This, in turn, can lead to an even larger adaptation gap. It can prevent countries from breaking out of the downward spiral of multiple disasters that generates loss and damage and further debt.

Parametric insurance for sovereign debt can offer a sustainable option for moving from a vicious to a virtuous cycle and resolving the risks of a debt fallout for LDCs. This insurance would cover a country's debt repayment during a climate crisis, allowing them time to recover without repaying debt during that period. While parametric insurance may not be suited to all types of hazards, it is considered effective for diverse climate risks from loss and damage.

Parametric insurance for sovereign debts can help LDCs better manage the twin challenges of debt and climate crisis. It can act as a safeguard, provide immediate liquidity, reduce transaction costs, stabilise credit markets and attract private investments. Such a model has four essential elements:

- A mechanism to provide anticipatory support once the 'trigger' has been reached, regardless of losses.
- A risk-pooling approach that ensures premiums are affordable and coverage and duration of debt relief meet country requirements.
- Location-specific and comprehensive climate risk modelling to define triggers and thresholds for insurance pay-outs from a full range of events.
- A commitment from climate and other sources of finance to cover insurance premiums.

The trade-offs between fiscal costs and risk to growth, debt default and costs of debt restructuring would need to be weighed carefully. The ex post benefits of covering the insurance premium for debt relief can far exceed the investment in premiums. Direct support to LDCs for insurance costs would alleviate the financial constraints and help countries scale up financial resilience. It would also stabilise their growth, reduce poverty and allow them to invest in social protection.

A coordinated effort with support from G20 governments, other major developed countries and key institutions will be needed to operationalise parametric insurance for sovereign debts. This should cover the points below.

**Establish a global fund** to enable risk pooling of all LDCs and SIDS and offer a more diversified portfolio to insurance companies. In addition to covering premiums and guarantees for sovereign debts, the global fund can support longer-term adaptation and resilience building in LDCs. This would support risk reduction and therefore help reduce the magnitude of future losses and bring down the cost of premiums in the long run.

**Undertake comprehensive risk modelling and data analytics** to help in pricing, designing trigger thresholds and structuring the provision of adequate insurance coverage. Improved measurement will also help lower insurance costs.

**Establish collaboration between multiple stakeholders**, including LDC governments, major public and private sector lenders, Paris Club creditors, International Monetary Fund, World Bank and other international and regional development banks; the insurance and reinsurance industry; national technical agencies, data providers and the risk modelling community; and academia, centres of excellence and nongovernmental organisations.

## 1

# Climate change and financial stability of LDCs

Loss and damage concerns are urgent, driven by the increasingly harmful effects of climate change. Many countries are facing new types and forms of climate impact with higher intensity, which they are not equipped to handle. With global temperatures increasing due to climate change, many of these impacts are already 'locked in' and unavoidable. Rising sea levels have submerged many coastal areas; floods are increasing in magnitude and breaching the existing barriers, destroying lives, livestock and property; and more intense and frequent cyclones are leaving communities unable to protect themselves.

This loss and damage, which can exceed annual gross domestic product (GDP), is often felt most acutely by Least Developed Countries (LDCs) (Heinrich Boll Stiftung et al., 2021). LDCs and Small Island Developing States (SIDS) have limited capacity, resources and infrastructure to invest in climate resilience. This leaves them unable to recover from loss and damage in the same way as developed countries, exacerbating their indebtedness. The Emergency Events Database (EM-DAT), for example, recorded US\$2.97 trillion in losses from disasters between 2000 and 2019. As a percentage of GDP, losses to LDCs were three times greater than in high-income countries (CRED, 2020). Countries in the global South have seen their debts increase by 120% between 2010 and 2021, reaching their highest level since 2001 (Jones, 2022).

## What this paper is trying to achieve

The analysis presented in this paper has two aims:

First, it demonstrates how climate impacts are driving up sovereign debts in LDCs compared to other countries. It also illustrates how higher sovereign debts are having an impact on GDP and social spending of LDCs. This is compromising previous development efforts and undermining those to come, enhancing vulnerability. This co-relation helps make the case for providing vulnerable countries with the debt relief necessary to adapt to climate change impacts.

Second, it suggests practical solutions for managing the debt crisis in LDCs through parametric insurance of sovereign debts. To date, many solutions<sup>1</sup> have been proposed to help LDCs manage debt, but the role of parametric insurance for helping LDCs manage sovereign debt payment during crisis, has not been explored. In our paper we propose it as one of the viable options to consider along with others, so the LDCs are not forced into more debt for a crisis they did not create. This paper proposes establishing and delivering a new global financing facility to service parametric insurance for sovereign debts.

<sup>1</sup> Other existing and emerging instruments include nature for debt swaps (see more details at [www.iied.org/tackling-debt-climate-nature-crises-together](http://www.iied.org/tackling-debt-climate-nature-crises-together))

## BOX 1. WHY THIS ANALYSIS IS NEEDED NOW

The 'Summit for a new Global Financing Pact' proposed in June 2023 has the mandate for increasing access to financing for countries more exposed to shocks and/or facing debt vulnerabilities. Similarly, the Transitional Committee created under the United Nations Framework Convention on Climate Change is looking at establishing the modalities, structure and governance of a climate change loss and damage fund. This paper provides evidence for LDCs and SIDS to present a stronger case on how climate impacts are pushing them into over-indebtedness undermining ability to deal with climate impacts — and to push for creation of a separate global fund (with additional, adequate funding, commensurate to LDC needs) for dealing with debt issues. It also presents practical solutions for the Summit, Transitional Committee, governments of the G20 and key institutions such as the International Monetary Fund and World Bank to consider for dealing with debt issues through parametric insurance.

## 2

# How climate change is affecting levels of debt, growth and development in LDCs

Climate change is disrupting environmental, economic, institutional and social systems in LDCs. These disruptions are undermining poverty reduction efforts and food security, damaging infrastructure and jobs, and harming human health. But these impacts are unevenly distributed, with some countries facing far greater risks than others.

LDCs are more vulnerable to the effects of climate change due to their low levels of development, weak infrastructure, and reliance on agriculture and natural resources for income. They are more likely to face significant and long-lasting impacts of climate change on economic growth and development.

This section presents how climate change is increasing sovereign debts and risks of debt default in LDCs. These impacts, in turn, are reducing social spending, undermining countries' ability to cope and recover.

## Risks of climate impacts and sovereign debt default for LDCs

Recurring and high-intensity climate disasters can lead to a shortfall in government revenue and tax collections due to disrupted economic activities. But government

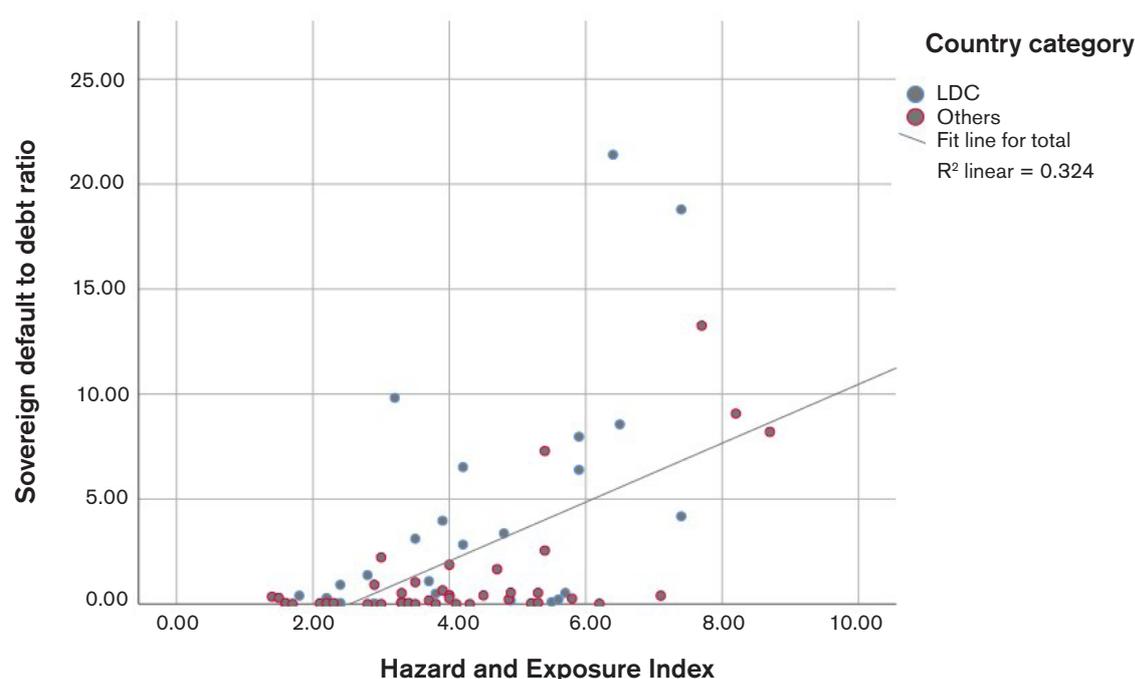
spending may also increase due to a sudden and significant increase in demand for its services. For example, government may need to fund an emergency response and invest in rebuilding and recovery. Consequently, to bridge this gap and continue to provide essential services and support to their citizens, governments may need to borrow money.

Figure 1 presents the association between the Hazard and Exposure Index and sovereign default to debt ratio. The Pearson's correlation coefficient values for the variables analysed are presented in Table 1.

The analysis shows that countries with a higher Hazard and Exposure Index are likely to have a higher sovereign default to debt ratio. The average default to debt ratio of 30 LDCs considered for this analysis is 3.45 with an average Hazard and Exposure Index of 4.16. The predicted values of regression modelling between these two variables are higher for LDCs than for the other countries. In the case of LDCs, a Hazard and Exposure Index of 10 can increase the chances of debt default<sup>2</sup> to 11.07 with countries including Niger, Myanmar, Sudan, Mozambique and Mali most at risk. Other countries have a debt default risk of 7.66. This finding resonates with findings by IMF (Cevik and Jalles, 2020). According to this study, the number of countries in the global South unable to pay their debts or at high risk

<sup>2</sup> Default risk: "Sovereign default risk represents the likelihood that a particular sovereign will default on its debt. While most debt defaults involve foreign debt, sovereigns may also default on domestic debt denominated in the national currency." [www.investopedia.com/terms/s/sovereign-default.asp](http://www.investopedia.com/terms/s/sovereign-default.asp)

Figure 1. Relationship between Hazard and Exposure Index to sovereign debt default



Notes: The sovereign default to debt ratio has been calculated as average sovereign default to loans from 2016–2020/sovereign debt in 2021 (Source: International Monetary Fund's Global Debt Database). The Hazard and Exposure index is calculated based on time series data from INFORM Risk database 2021.

Table 1. Correlation coefficients of Hazard and Exposure Index and sovereign default to debt ratio

DEVELOPMENT CATEGORY	CORRELATION COEFFICIENT	SIG.
All countries (N=71)	0.569	p=0.000
LDCs (N=30)	0.601	p=0.000
Other countries (N=41)	0.646	p=0.000

of default increased from 17 to 39 between 2013 and 2021, while the number of countries at low risk fell from 21 to just 7.

## Climate impacts forcing LDCs and SIDS to layer debt on debt

When a disaster strikes, LDCs and SIDS have to borrow additional money on top of the country's pre-existing debt load, which further increases their risk of over-indebtedness. It normally takes many years for LDCs and SIDS to recover from an extreme event. As the intensity and frequency of extreme events keeps increasing, these countries are more exposed to them every year. Each time, their response creates more debt, undermining capacity for the next crisis. They thus become trapped in an unsustainable debt cycle. For example, in Dominica, Tropical Storm Erika

caused damages equivalent to 96% of GDP in 2015, which increased the country's external debt. Two years later, while the country was still recovering from Erika, Hurricane Maria caused US\$1.3 billion in damages. This was equivalent to 226% of its GDP, resulting in declining fiscal performance and increased expenditure on recovery (Thomas and Theokritoff, 2021). Dominica had to take on more debt not just to service previous debts but also to spend on recovery from the hurricane.

Across Caribbean SIDS, extreme weather events resulted in average losses of 109% per unit GDP in 2019 (Thomas and Theokritoff, 2021). These losses pushed the countries into a vicious cycle of indebtedness with potential longer-term consequences on their ability to continue servicing or repaying additional debts. Meanwhile, without support from climate finance, sub-Saharan countries might be forced to take on almost US\$1 trillion in debt in the next decade (Woolfenden, 2022).

## Rising cost of capital for climate-vulnerable countries threatens debt sustainability

Climate vulnerability also has significant implications for sovereign borrowing costs. For credit-rating agencies, higher climate risks create a greater risk of default. This raises the cost of capital for climate-vulnerable countries and threatens debt sustainability. Consequently, poorer countries exposed to climate impacts have to bear the additional burden of higher interest rates. An assessment (Buhr et al., 2018) for the members of the Climate Vulnerable Forum<sup>3</sup> shows that for every US\$10 paid in interest by developing countries, an additional dollar will be spent due to climate vulnerability. This has also added more than US\$40 billion to the debt interest paid by the 40 most vulnerable nations between 2007 and 2016. Higher interest rates based on climate vulnerability are predicted to cost the most vulnerable countries US\$168 billion over the next decade. One study (Mohaddes et al., 2021) shows that 63 sovereigns may see their credit ratings downgraded by 2030 due to climate change. This could add more than US\$200 billion to their annual interest payments on public debt. An increasing proportion of global South debt is owed to private creditors, who tend to charge much higher interest rates than other lenders. Almost half of external debt and interest payments by low- and lower middle-income countries are to private lenders (Jones, 2022).

### BOX 2. WHY SUSTAINABLE DEBT SERVICING IS IMPORTANT

For countries, sovereign debt, or public debt, is an important way to finance investments in growth and development. But governments must also continue paying or servicing their debt and this debt burden must remain sustainable. In other words, debt payments must be in tune with growth projections and revenue mobilisation. This includes social spending needs and exposure to economic/climate shocks. Unsustainable debt burden can lead to debt distress, leaving a country unable to repay or service its debts.

Debt distress can be precarious for countries and threaten their macro-economic stability, setting back their development for years. It can also curtail public spending on basic services and social protection, resulting in increased poverty and vulnerability.

This financial burden exacerbates the present-day economic challenges of poorer countries (see Box 2). The magnitude of this burden is expected to at least double over the next decade. These credit-rating downgrades can be expected to increase the cost of public borrowing, making it more expensive to make investments in recovery or building resilience for future impacts. The rising cost of capital is expected to push LDCs into debt distress.<sup>4</sup>

## Impact of sovereign debt default on social spending of LDCs

The increased public default to debt ratios undermine the ability of LDCs to finance investments in social protection programmes such as poverty reduction, livelihood security, food, nutrition, health and education. Many of these investments are crucial to enhancing climate resilience in vulnerable communities. Resources needed to respond to the climate crisis, the COVID-19 pandemic and other national needs are increasingly being diverted to debt repayments. These diversions can have social impacts: without strong safety nets, the most vulnerable may not have adequate mechanisms to cope with climate crisis.

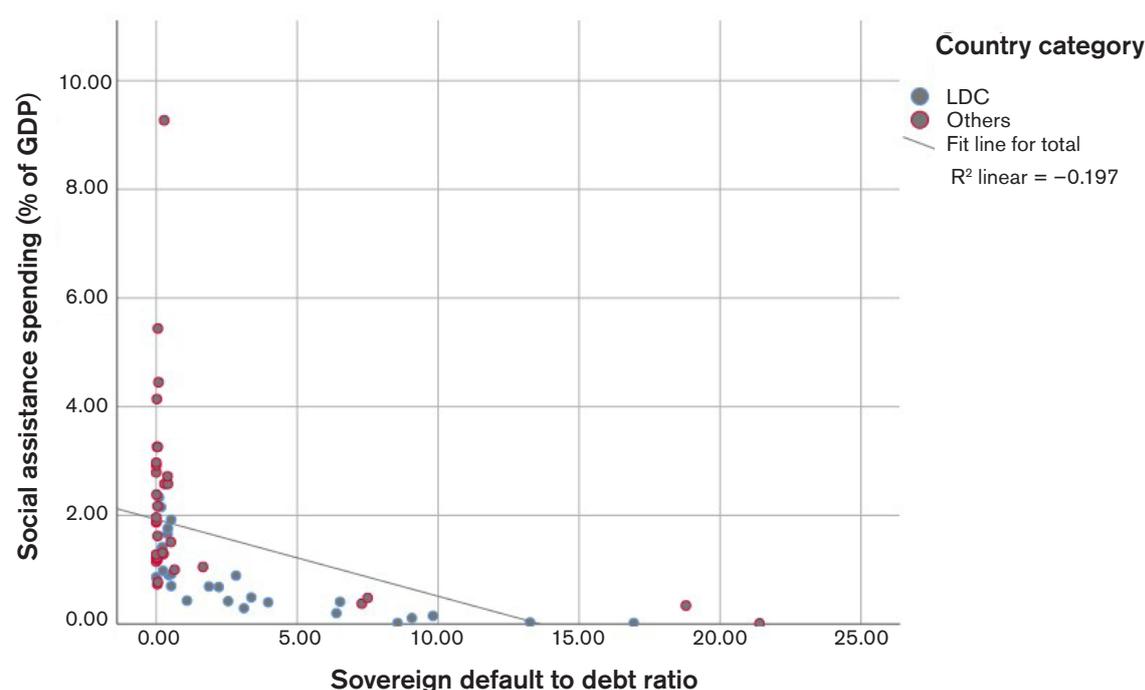
Figure 2 analyses the relationship between sovereign default to debt ratio and social assistance spending. Pearson's correlation coefficient values of these two variables are presented in Table 2.

The correlation analysis shows that countries with a higher sovereign default to debt ratio are likely to spend less on social assistance. The degree of negative association is particularly stark in the case of LDCs. The Pearson's correlation coefficient value for LDCs (-0.697) is significantly higher than the value for developed and developing countries (-0.366). The projected values based on the regression modelling confirms this pattern. The 27 LDCs considered for this analysis have an average default to debt ratio of 3.53 with average social assistance spending of 0.82% of GDP. In the case of LDCs, the projected value of social assistance spending decreases to 0.14% of GDP when the sovereign default to debt ratio is 10. For the same default to debt ratio, the projected social assistance spending is 1.08% for developed and developing countries. This projection based on the regression modelling lists Guinea-Bissau, Cambodia, Tanzania, Togo and Myanmar (all LDCs) as the countries most vulnerable to reducing their spending on social assistance.

<sup>3</sup> The Climate Vulnerable Forum is an international partnership of countries highly vulnerable to a warming planet. The Forum serves as a South-South platform for participating governments to act together on global climate change. <https://thecvf.org/>

<sup>4</sup> "Unsustainable debt can lead to debt distress — where a country is unable to fulfil its financial obligations and debt restructuring is required. Defaults can cause borrowing countries to lose market access and suffer higher borrowing costs, in addition to harming growth and investment." [www.imf.org/en/Publications/fandd/issues/2020/09/what-is-debt-sustainability-basics](http://www.imf.org/en/Publications/fandd/issues/2020/09/what-is-debt-sustainability-basics)

Figure 2. Relationship between sovereign default to debt ratio and social assistance spending



Note: Data on social spending were drawn from the World Bank's ASPIRE (The Atlas of Social Protection Indicators) database for the year 2021.

Table 2. Correlation coefficients of sovereign default to debt ratio and social assistance spending

DEVELOPMENT CATEGORY	CORRELATION COEFFICIENT	SIG.
All countries (N=61)	-0.443	p=0.000
LDCs (N=27)	-0.697	p=0.000
Other countries (N=34)	-0.366	p=0.033

This finding is in line with experience from the COVID-19 pandemic, which shows that governments have differing capacity and fiscal space to respond to crises. In all cases, social spending is the first to take the hit, contributing to a more protracted crisis in the case of LDCs. For example, developed countries, backstopped by their central banks, came up with huge fiscal response packages. These amounted to 18% of their GDP and that too at low interest rates (UN Inter-agency Task Force on Financing for Development, 2022). Availability of fiscal space enabled them to not only roll out measures immediately but also channel resources towards strengthening social protection. But developing countries, especially LDCs, were constrained in their social spending (Debrun, 2020).

LDCs already have lower ratings on human development, and economic and environmental vulnerability. They represent around 90% of the countries with poverty rates higher than 40% in 2021 (Development Initiatives, 2021). Further reductions in social spending can thus have long-term negative impacts on human development indicators in LDCs, such as poverty, education and health outcomes.

## Links between debt levels, debt default and multidimensional vulnerability in LDCs

Poorer and marginalised groups that depend on primary sector livelihoods such as fishing and agriculture are the most affected by natural disasters. Yet these are the very communities with the least capacity to cope. Fishers, for example, are most likely to lose their livelihood resource base because of disasters and cannot adapt as quickly to changing conditions. Similarly, as climate change affects agricultural yields and productivity, it will increase food prices. This, in turn, can increase poverty in LDCs. For example, in Malawi, households spend on average 63% of their income on food and beverages. Even a small increase in food price can throw them into deeper poverty. Exposure to cyclones, floods and other extreme events, for example, will lead to health shocks because of increased diarrhoeal diseases and displacements (Hallegatte and Walsh, 2020).

Similarly, certain communities, social groups and Indigenous Peoples may be at a higher risk of adverse consequences of climate impacts. Jafino et al. (2020) show that climate change will push 132 million people into extreme poverty by 2030. Factors such as poverty, marginalisation and lack of access to essential services may limit their capacity to cope with climate impacts, amplifying the impact of loss and damage.

Figure 3 analyses the relationship between sovereign default to debt ratio and multidimensional risk. Pearson's correlation coefficient values of these two variables are presented in Table 3.

The correlation analysis presented in Table 3 shows that countries with higher sovereign debt are likely to have a higher multidimensional risk index value. The projection analysis of regression modelling between these two variables shows that the multidimensional risk index value is higher for LDCs than for developed and developing countries. The projected multidimensional index is 5.77 in the case of LDCs when the sovereign default to debt ratio is kept at 10. The same projected value is 4.83 at a sovereign default to debt ratio of 10 for developed and developing countries.

The regression analysis presented in Figure 3 shows that countries with a higher sovereign default to debt ratio are likely to have a higher multidimensional risk value. In the case of LDCs, the multidimensional risks are expected to increase by 5.77% for a debt default ratio of 10 compared to 4.83% in other countries.

Figure 4 further unpacks multidimensional risks of LDCs compared to other developing countries and developed countries. It aggregates 54 core indicators across environmental, human, socioeconomic, institutional and infrastructure categories. These indicators envisage three dimensions of risk: hazards and exposure, vulnerability and lack of coping capacity.

Results from Figure 3 and 4 clearly show that social, environmental, institutional, infrastructural and economic development deficits in LDCs are more complex than in other developing countries and developed countries. Climate change and associated debt levels are acting as stress multipliers, compounding these deficits. This makes it difficult for these countries to anticipate, respond to and recover from climate impacts resulting in loss and damage.

Table 3. Correlation coefficient of sovereign default to debt ratio and multidimensional risk index

DEVELOPMENT CATEGORY	CORRELATION COEFFICIENT	SIG.
All countries (N=61)	0.611	p=0.000
LDCs (N=27)	0.645	p=0.000
Other countries (N=34)	0.644	p=0.000

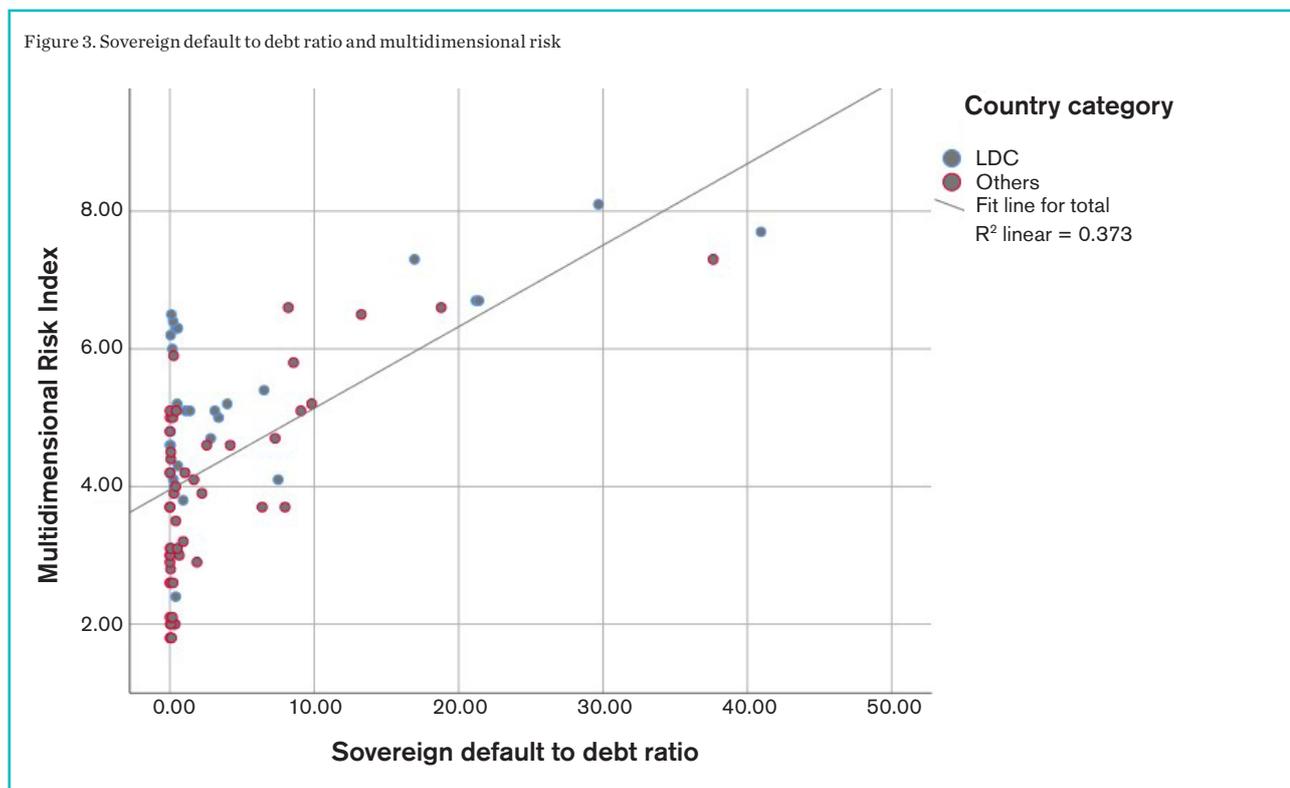
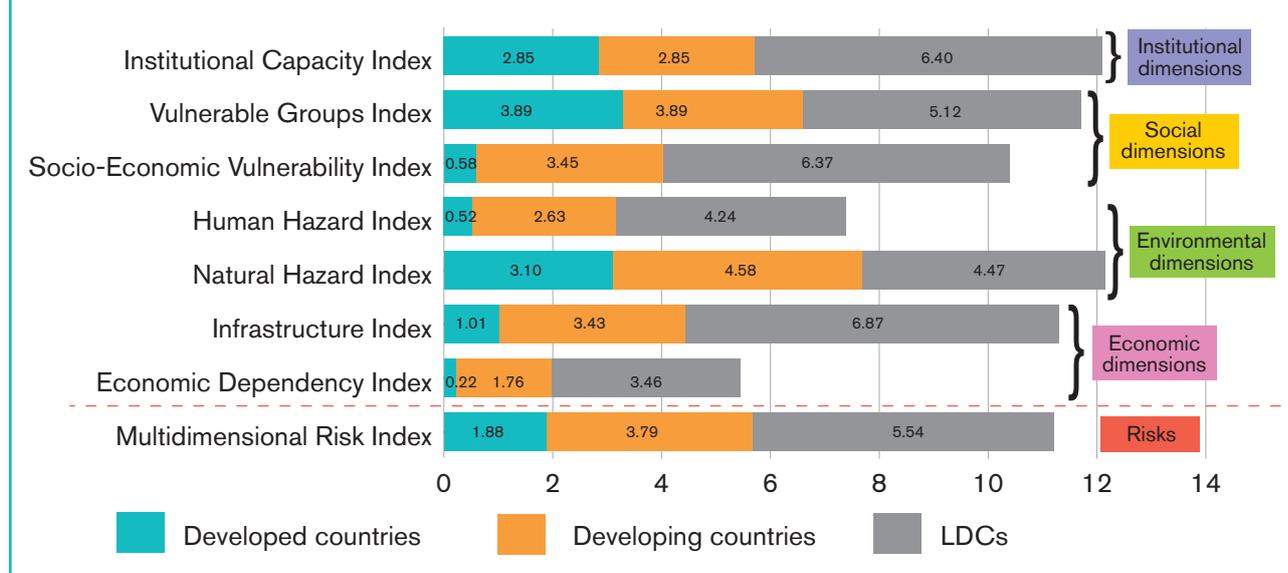


Figure 4. Multidimensional risks of LDCs compared to other developing countries and developed countries



Countries with debt defaults also experience more political instability as citizens lose faith in their government's ability to manage the economy or with cuts in social spending. Sri Lanka and Pakistan are recent examples of this phenomenon. Even in countries that are not LDCs, climate disaster, debt and fragility can prove to be a volatile combination. Together, they can lead to protests, civil unrest and even regime change, all of which can further hinder economic development.

The International Monetary Fund (IMF) classifies more than 40 economies as fragile and conflict affected. Fragile states are home to nearly 1 billion people and are on course to house 60% of the world's poor by 2030 (Corral, 2020). These countries have reduced institutional capacity and can provide limited services for the population during future crises. In these vulnerable economies, per capita GDP contracted 7.5% in 2021, while public debt rose by 17 percentage points to 78% of GDP in 2020 (Bousquet, 2022). In all, 22 or 45% of fragile states are LDCs, which are expected to be the worst affected by the triple crisis of disaster, debt and fragility.

## Increasing debt crisis and problems with debt restructuring

Debt restructuring efforts are limited and not fit for purpose. In response to the COVID-19 pandemic, the IMF offered support through the Catastrophe Containment and Relief Trust, while the G20 created the Debt Service Suspension Initiative (DSSI). DSSI

postponed rather than cancelling debt payments, making future recovery even more difficult for these countries. In November 2020, the G20 and the Paris Club<sup>5</sup> set up the Common Framework for Debt Treatments (MEF, n.d.). This sought to restructure sovereign debt according to traditional Paris Club terms (going beyond the postponement of debt payments under DSSI). But uptake of the Common Framework has been limited, with only three countries (Chad, Ethiopia and Zambia) seeking relief as it lacks clear steps and timelines for bringing the parties of debt restructuring together (Aboneaa et al., 2022). As a result, debt relief has also failed due to the lack of consensus between the main creditors. This is especially true of private creditors, who own the bulk of the debts. Without this group at the table, debt relief would only be limited.

Here, the role of climate finance is also under question. In 2020, out of US\$68.3 billion of climate finance provided by developed countries, 71% or US\$48.6 billion was in the form of loans (including both concessional and non-concessional) (OECD, 2022). Around half of climate finance provided to SIDS in 2017–2018 was in the form of loans, which added more debt. Furthermore, all SIDS received a combined US\$1.5 billion in climate finance between 2016 and 2020. But in the same period, 22 SIDS paid more than US\$26.6 billion to their external creditors — almost 18 times as much as they received in loans (Fresnillo and Crotti, 2022).

<sup>5</sup> The Paris Club is an informal group of creditor countries whose objective is to find sustainable solutions to sovereign debt payment difficulties. It operates according to six foundational principles: solidarity, consensus, information sharing, case-by-case, conditionality and comparability of treatment.

## 3

# Parametric insurance for sovereign debt

Analysis in the previous section illustrates how high sovereign debts can lead to reduced investment in social protection and resilience building. This, in turn, can lead to an even larger adaptation gap. It can prevent countries from breaking out of the downward spiral of multiple disasters that causes loss and damage and further debt. To break this cycle, sufficient government budgets need to be freed to allow them to invest in rebuilding after a disaster, enhancing long-term resilience, and thereby reducing vulnerability, limiting loss and regaining debt sustainability.

Parametric insurance for sovereign debt can offer a sustainable option for moving from this vicious to a virtuous cycle and resolving the risks of a debt fallout for LDCs. This would involve providing parametric

insurance cover for debt undertaken by a country. Where the insurance would cover debt repayment on behalf of the country during the period of climate crisis, allowing countries time to recover, without worrying about debt repayment during that period. While parametric insurance may not be suited to all types of hazards, it is considered effective for diverse climate risks from loss and damage (see Box 3). Loss and damage can be applied to climate events even without a sufficient history of losses captured as insurance-readable data (Unnava, 2020).

Such an approach will go far beyond a debt moratorium, where the debt remains and accumulates. Here, debt repayment would continue as usual through the insurance mechanism. The countries would be freed from that burden during the crisis, helping them to focus on relief and recovery. The period of repayment coverage through insurance can be predefined. It would be based on the nature and intensity of the climate crisis and the time needed by the country to recover and start repayment.

Post-disaster financial needs typically have three phases: immediate relief and support; recovery; and rehabilitation and resilience building. A country needs funding for all three phases. In the relief and support phase, it will require immediate access to funds for urgent rescue, shelter, food and clean water for those affected or displaced. Early recovery will require funding, within weeks, to restore livelihoods and help communities return to some level of normality and restart their economic activities. Reconstruction and resilience building will require mobilising more substantial funds for repairing and rebuilding damaged assets such as homes and infrastructure.

Different types of funding support will be needed on different timescales. The parametric insurance support can help countries use their budget for the first two phases of support without diverting their budgets for

## BOX 3. PARAMETRIC VERSUS TRADITIONAL INSURANCE

Parametric, or index-based, insurance, is a non-traditional insurance that provides pay-outs based on a trigger event. Trigger events can include environmental parameters such as wind speed or rainfall measurements. Once parameters are reached, the pay-out is processed without the need to verify losses. In comparison, traditional indemnity insurance reimburses for the total value of the loss after an event like a flood or storm. To quantify loss, a representative from the insurance company assesses the damage.

Parametric insurance is suited for hard-to-model, low-frequency but high-intensity losses. These include catastrophic perils, weather-related risks or economic activities. They can also cover risks that lack a sufficient history of losses captured as insurance-readable data.

debt payment. This is vital because delays in relief and recovery in the early phase can negatively impact the population and the economy.

Support from parametric insurance pay-out can create a certain level of liquidity. In this way, debt repayment will not push countries into a negative spiral that undermines their capacity to recover and makes them less creditworthy. With a more stable economy after disaster, countries can focus more effectively on longer-term rehabilitation and resilience building through access to climate funds, bilateral aid and so on.

While parametric insurance for sovereign debt relief may only work for certain hazards, there is value in considering it as part of the risk layering approach alongside other risk mitigation and support mechanisms to create more fiscal flexibility and less indebtedness through the disaster cycle. Even with insurance support for debt relief, countries will still need support from climate finance in the form of grants and highly concessional loan capital to build longer-term climate resilience.

## How parametric insurance can help LDCs manage debt and climate crises

Parametric insurance for sovereign debts can help LDCs better manage the twin challenges of debt and climate crisis in several ways.

**Act as a safeguarding mechanism.** Countries will not have to worry about bad surprises such as droughts, floods and so on that require emergency borrowing. Debt reduction through insurance will safeguard against financial-sector stress and strengthen contingency planning and crisis management capabilities. It will help in maintaining debts at levels that countries will be able to reasonably pay back. Being able to manage the unexpected and potentially large one-off costs of disasters will reduce the volatility of financial losses. This, in turn, will help governments cope more easily with the consequences of disasters.

**Provide immediate liquidity.** Parametric insurance can initiate debt repayment pay-out quickly as it is easier to verify if the trigger event has reached the threshold specified in the policy. These quick pay-outs can be especially beneficial to free up a country's resources that they would have otherwise used to repay debts. This would be the best way to help countries as the funds will remain in their budgets and can be invested directly and without delay to expand social protection and rescue support, among other priorities. While these funds may not be sufficient to meet all the relief and response measures needed by a country during crisis, it can save existing budgets from being diverted for debt servicing and provide immediate liquidity.

**Reduce transaction costs.** Parametric insurance for sovereign debt can reduce transaction costs compared to cumbersome and time-consuming sovereign debt restructuring, which often comes with several conditionalities. Debt relief through parametric insurance will also reduce the post-crisis transaction costs of humanitarian aid. Aid has high transaction costs and comes with several conditions. In contrast, debt payment relief will be like cash in hand, where the countries can exercise greater control and prioritise its use as per their needs (Aboneaaj et al., 2022).

**Stabilise credit markets and attract private investments.** Higher sovereign debt creates uncertainty about a government's finances and ability to deliver macroeconomic stability, which can drive away private investors. Parametric insurance will help in sustainable servicing of debts, bring stability in capital markets, improve a country's credit worthiness and credit rating, and effectively reduce borrowing costs and interest rates. It would also boost the confidence of private investors by providing a model for de-risking their investment. In the long run, this would help attract private investments in climate adaptation.

## Four essential elements of parametric insurance linked to debt support

### Anticipatory support

The insurance mechanisms can provide pre-agreed debt repayment relief in a timely and predictable manner. Based on reliable early warning information, the relief would kick in once a certain measure or 'trigger' is reached, regardless of actual losses. This mechanism may only work in the case of hazards where triggers can be adequately defined. These trigger events can include flood, cyclones or droughts of a certain intensity or frequency. Once the predefined trigger points are reached based on advanced warning the insurer can cover debt repayment on behalf of the country for a certain pre-agreed time frame depending on what has been agreed in the policy. The pre-agreed debt repayment period will need to be tailored and costed based on diverse contexts, including what is needed to help countries recover from a climate crisis.

Anticipatory support will enable countries to be better prepared for a climate crisis. In this way, they can use finance freed-up by debt relief for pre-emptive support under existing social protection programmes or other relief measures. Such ex ante efforts can also help ramp up support before a crisis — a more cost-effective approach than providing humanitarian assistance after disaster strikes. Ex post support can cost a lot more because the disaster has already inflicted

damage. Apart from financial costs associated with displaced communities, outbreak of diseases and food insecurity, disaster brings an unmeasurable human cost. Anticipatory parametric insurance will allow countries to avert the impacts of these disasters on both people and the economy.

### Risk pooling

As the intensity, scale and frequency of many disasters are increasing due to climate change, insurance premiums are getting pushed up, making it unaffordable, and many of these events are also being deemed as uninsurable. In response, several countries have established insurance risk pools. In many cases, these programmes have been established to provide affordable insurance coverage for ‘uninsurable’ risks through private markets. In others, they promote solidarity by establishing regional risk pools to spread out the impact of losses. The Caribbean, Pacific islands and African Union, for example, have set up the Caribbean Catastrophe Risk Insurance Facility (CCRIF SPC), the Pacific Catastrophe Risk Assessment and Financing Initiative (PCRAFI) and African Risk Capacity (ARC) Insurance Programme (see Box 4). These regional pools provide significant advantages (Cebotari and Youssef, 2020). First, they provide insurance coverage at significantly lower cost than if countries had to purchase it individually. Second, they provide quick pay-outs following disasters, which help members maintain essential government functions. Third, policy holders own the facility (CCRIF, PCRAFI, ARC), which allows benefits to accrue to members either through dividend payments or lower premiums.

Parametric insurance for debt relief will need a similar risk-pooling approach to ensure that the premiums are affordable, and that the coverage and duration of debt relief meets the requirements of the countries. By offloading some portion of risk, the insurance company reduces its overall risk and can keep premium costs lower for all of its clients (Cebotari and Youssef, 2020). As risk pools grow, the cost of operation and reinsurance in global capital markets drops, which

could in turn help lower premiums. Regional pools can also facilitate access of smaller countries to insurance and reinsurance markets by increasing the size of the aggregate portfolio, offering country-specific risk models and reducing administrative costs.

### Optimum coverage of risks

Parametric insurance, while has advantages, will only pay after a certain level of risk is reached. This trigger might not happen for several reasons. For example, the strength of a disaster might be measured in a different location from where it occurred. As a result, it might not reach the level needed to trigger the insurance. Similarly, the risk of actual losses might also exceed modelled losses. To address these issues, parametric insurance needs better location-specific and comprehensive climate risk modelling to define triggers and thresholds for insurance pay-outs.

The distribution of future climate impacts and their associated damages, from both slow-onset and extreme weather events in climate models, are generally shown as averages. High probability events, for example, tend to appear as a huge peak on a graph. Conversely, rare events with potentially disastrous effects appear with low probability as a tail to the curve. But even with relatively low probability, the outcomes of these rare tail events can be catastrophic and cause loss and damage.

Thus, countries need insurance protection against a full range of events. To do this, insurance products need to change how they consider climate modelling outputs. Taking an average of different global climate models is common practice, but this does not always provide the true scale of impacts. Averaging all the results obscures the range of likely impacts, and the range of less likely, more catastrophic events — the very ones that usually cause greater loss and damage — tend to get neglected.

The trigger measurement and design for insurance coverage should be fit for purpose for a range of these possible extreme weather events. The probability of these major disasters is small, but the fast — and

## BOX 4. RISK POOLING

Participating countries in the Caribbean, the Pacific islands and African Union have transferred their risks to three well-established regional pools that provide lower insurance premiums:

RISK-POOLING INITIATIVES	HAZARDS INSURED
CCRIF (2007)	Earthquake, tropical cyclone (hurricanes), excess rainfall, drought
PCRAFI (2013)	Tropical cyclone, earthquake/tsunami, excess rainfall
ARC (2013)	Drought, extreme weather (excess rainfall, heatwaves and tropical cyclones)

potentially large — insurance pay-outs are more valuable in mitigating their effects on possible debt default and its cascading effect on growth. Similarly, the higher frequency of smaller disasters may also require coverage to help countries rebuild because even recurring moderate events can cause significant damage. The design of the triggers will need to consider all the types of events that could have an impact on the country's fiscal performance.

### Climate and other sources of finance to cover insurance cost

Under the proposed model, parametric insurance is not expected to cover the full debt. Rather, it would provide emergency liquidity to help countries recover from disasters. But this coverage might be inadequate for several reasons. First, it might only cover debt payment for a short time. Second, it may not provide enough protection to help a country recover fully from a disaster.

Insurance coverage that adequately covers these possibilities would cost more. Conversely, less coverage would cost less but also provide limited protection in terms of debt relief. This is why LDCs and SIDS would need optimal financial protection. These countries are already facing tighter borrowing

constraints with higher interest rates and poor credit ratings because of their climate vulnerability. The benefits of risk transfer for debt sustainability are higher for them, but insurance costs can be prohibitive and would only add to their debt burden.

The cost of insurance premiums will therefore need to be covered through climate finance, members of the Paris Club and other sources proposed to provide debt relief to countries, such as the IMF and multilateral development banks, under the principles of climate justice and solidarity. The Global Shield initiative announced at COP 27 also opens up opportunities for piloting and scaling up parametric insurance for sovereign debt relief.

The trade-offs between fiscal costs and risk to growth, debt default and costs of debt restructuring would need to be weighed carefully. The ex post benefits of covering the insurance premium for debt relief can far exceed the investment in premiums. Direct support to LDCs for insurance costs would alleviate the financial constraints and help countries scale up financial resilience. It would also stabilise their growth, reduce poverty and allow them to invest in social protection.

## Delivering debt support linked to parametric insurance

A coordinated effort with support from G20 governments, other major developed countries and key institutions such as the IMF and World Bank will be needed to operationalise parametric insurance for sovereign debts. This should cover the points below.

### Establish a global fund

A global fund based on contribution from G20 countries, debt relief funds of the IMF and World Bank, and climate finance pledges from developed countries will be needed to service the insurance premium for LDCs. This fund will enable risk pooling of all LDCs and SIDS and offer a more diversified portfolio to insurance companies.

The fund may need to respond to some critical questions to make such a model work at scale, particularly for LDCs and SIDS:

- What conditions would be attractive to insurers and reinsurers to keep premiums as low as possible?
- How can the risk pool work for a diversified portfolio of countries given some will be at higher risk than others and may need access to insurance support more often than others?
- What conditions would allow international climate finance to support risk-pooled debt finance at scale?

## BOX 5. HOW MUCH INSURING GDP LOSSES CAN COST

To estimate the average insurance premium for a risk pool, we used the data of 49 LDCs on fatalities; absolute losses (in million US\$ purchasing power parity (PPP)); losses per unit GDP in percentage and Climate Risk Index (CRI); core from Global Climate Risk Index, 2021; and IMF estimate of actual GDP (in million US\$) and their forecasted GDP based on PPP (in million US\$) of these countries. The risk premiums were assigned by assuming probabilities for frequency of losses to GDP and hazard and vulnerability exposure based on CRI score. Based on composite function of these factors, the risk premium (for loss in GDP PPP) for 49 LDCs comes to US\$135 million. Using the same approach, the risk premium for Mozambique comes to US\$58.42 million (highest CRI score), if insured individually. The premium calculation has assumed factors like vulnerability to climate impacts, expected losses, expenses and profit margin of insurance company and deductibles. Although standardised rates have been assumed for calculation, the actual estimate of the probabilities of occurrence of climate events, as well as the resulting loss estimate, would require building complex and sophisticated models. These values should thus be viewed with those limitations in mind.

- How can non-insurability of some events be addressed? How might reinsurance or guarantee from the global fund work for high-severity events to limit the magnitude of potential losses for insurers?

In addition to covering premiums and guarantees for sovereign debts, the global fund can support longer-term adaptation and resilience building in LDCs. This would support risk reduction and therefore help reduce the magnitude of future losses and bring down the cost of premiums in the long run.

## Undertake comprehensive risk modelling and data analytics

The global fund will also need to play a leading role in developing risk analytics and modelling tools. What risks should insurance cover? What is the likely frequency and size of losses that will need to be covered? This assessment will help in pricing, designing trigger thresholds and structuring the provision of adequate insurance coverage. Improved measurement will also help lower insurance costs.

Catastrophe risk modelling, developed by the insurance industry, uses data on parameters that describe the magnitude, frequency and geographic distribution of potential losses. This enables insurance companies to price and structure coverage correctly. The development, calibration and use of such models require multidisciplinary technical expertise and experience with interpretation of model output, and the input data for such models are often unavailable or incomplete (UNISDR, 2017). Incomplete knowledge of hazard events and their impact means more uncertainty for insurance pricing. To address these needs and reduce uncertainties, the global fund will need to invest in collecting and modelling hazard, exposure and vulnerability data. This would support the design of appropriate trigger mechanisms and avoid basis risks.

The data collection and models could be developed in collaboration with national meteorological and climate modelling experts. These could include academics; national meteorological, hydrological and geological services; and other government and nongovernmental agencies that collect and maintain sectoral data such as national bureaus of statistics. The process could build capacity to promote sustainable maintenance of the risk data. Further, engaging in-country stakeholders will ensure that LDC government needs and requirements are considered in design of the triggers and thresholds. Stakeholders can also ensure that development of in-country technical and operational capacities for data collection and risk analytics feeds in to design of triggers and insurance coverage. Finally, an inclusive approach will help ensure transparency on source and analysis of risk parameters.

## Establish collaboration between multiple stakeholders

Collective buy-in will be crucial to make such a global fund work. Key partners, and their roles, are noted below:

- (i) Participating LDC governments, and their relevant finance and environment ministries — to understand their needs and requirements for debt relief and how to structure the debt relief to support adequate time for recovery from disasters.
- (ii) Major public and private sector creditors, Paris Club creditors, IMF, World Bank and other international and regional development banks — to bring them on board, seek funding support and design the structure and modality for retrofitting insurance with existing debts or imbedding it with those planned in future.
- (iii) Insurance and reinsurance industry — to help co-design the insurance product and risk-pooling arrangements that provide optimum coverage of risks.
- (iv) National technical agencies, data providers and the risk modelling community — to support availability of data and more accurate risk modelling.
- (v) Academia, centres of excellence and nongovernmental organisations — to bring in a local/grassroots perspective to understand the needs, vulnerabilities and priorities of local communities and incorporate them in design of insurance cover.

A range of creditors must come on board. In previous eras, the multilateral and Paris Club lenders owned the LDCs' debt, but today private creditors and China own the bulk of it. The participation of private creditors will increase capital and bring down insurance costs. But more than that, it is essential for success. If some creditors do not sign on and collect their debt payment in full when other parties provide relief, it would not free up all debt. This, in turn, would prevent LDCs/SIDS from focusing their budget on relief and rehabilitation following the disasters.

# 4.

## Looking ahead

The climate crisis is pushing vulnerable LDCs into over-indebtedness, amplifying their disparity with developed countries. A deeply unequal global system makes it difficult for them to graduate out of debt and poverty. Fundamental changes are needed to re-engineer, regulate and equalise global debt and growth.

The Global Financing Pact agenda and the commitment to create a loss and damage fund under the United Nations Framework Convention on Climate Change offer an opportunity to create a global fund for supporting debt relief of LDCs and SIDS. Such a fund could better respond to the needs of communities at the frontline of the crisis. Automatic debt payments before or in the aftermath of extreme weather events would cover both public and private lenders. In addition, such a mechanism would provide adequate and appropriate grant-based climate finance to help countries develop long-term resilience. We call upon the IMF, World Bank, G20 countries and developed countries to channel the needed climate finance and technical assistance into this global fund to help LDCs and SIDS better manage the twin challenges of climate and debt risks.

# Annexes

## List of countries considered for the correlation/regression analysis

### ANALYSIS: RELATIONSHIP BETWEEN HAZARD AND EXPOSURE INDEX AND SOVEREIGN DEFAULT TO DEBT RATIO

LDCs	Other countries	
Angola	Albania	Serbia
Benin	Argentina	Seychelles
Burkina Faso	Belarus	St Vincent and the Grenadines
Burundi	Belize	Syrian Arab Republic
Cambodia	Bolivia	Tajikistan
Congo, Rep.	Bosnia and Herzegovina	Tonga
Djibouti	Botswana	Tunisia
Equatorial Guinea	Cameroon	Ukraine
Ethiopia	Dominica	Uzbekistan
Gambia, The	Dominican Republic	Vietnam
Guinea	Ecuador	Zimbabwe
Guinea-Bissau	Fiji	
Haiti	Gabon	
Liberia	Georgia	
Madagascar	Ghana	
Malawi	Iran, Islamic Republic of	
Maldives	Iraq	
Mali	Jamaica	
Mauritania	Jordan	
Mozambique	Kazakhstan	
Myanmar	Kenya	
Niger	Korea, Republic of	
Rwanda	Kyrgyz Republic	
Senegal	Libya	
Sierra Leone	Mauritius	
Sudan	Mongolia	
Tanzania	Nicaragua	
Togo	Papua New Guinea	
Uganda	Peru	
Vanuatu	Romania	

## ANALYSIS: RELATIONSHIP BETWEEN SOVEREIGN DEFAULT TO DEBT RATIO AND SOCIAL ASSISTANCE SPENDING

LDCs	Other countries
Afghanistan	Albania
Angola	Argentina
Benin	Belarus
Burkina Faso	Bolivia
Burundi	Bosnia and Herzegovina
Cambodia	Botswana
Congo, Democratic Republic of	Brazil
Congo, Republic of	Cameroon
Djibouti	Dominica
Ethiopia	Dominican Republic
Guinea	Ecuador
Guinea-Bissau	Egypt, Arab Republic of
Maldives	Fiji
Mali	Georgia
Mauritania	Grenada
Mozambique	Iraq
Myanmar	Jamaica
Niger	Jordan
Rwanda	Kazakhstan
Senegal	Kenya
Sierra Leone	Kyrgyz Republic
Sudan	Libya
Tanzania	Mauritius
Togo	Mongolia
Uganda	Papua New Guinea
Zambia	Peru
	Romania
	Serbia
	Seychelles
	Tajikistan
	Tonga
	Tunisia
	Ukraine
	Vietnam
	Zimbabwe

## ANALYSIS: RELATIONSHIP BETWEEN SOVEREIGN DEFAULT TO DEBT RATIO AND MULTIDIMENSIONAL RISK INDEX

LDCs	Other countries	
Afghanistan	Albania	Kyrgyz Republic
Angola	Argentina	Lebanon
Benin	Barbados	Libya
Burkina Faso	Belarus	Mauritius
Burundi	Belize	Mongolia
Cambodia	Bolivia	Nauru
Congo, Democratic Republic of	Bosnia and Herzegovina	Nicaragua
Djibouti	Botswana	Papua New Guinea
Equatorial Guinea	Brazil	Peru
Ethiopia	Cameroon	Romania
Gambia, The	Congo, Rep.	Serbia
Haiti	Dominica	Seychelles
Liberia	Dominican Republic	St Vincent and the Grenadines
Madagascar	Ecuador	Syrian Arab Republic
Malawi	Egypt, Arab Republic of	Tajikistan
Maldives	Fiji	Tonga
Mali	Gabon	Tunisia
Mauritania	Georgia	Ukraine
Mozambique	Ghana	Uzbekistan
Myanmar	Greece	Vietnam
Niger	Grenada	Zimbabwe
Rwanda	Guinea	Ukraine
Senegal	Guinea-Bissau	Uzbekistan
Sierra Leone	Iran, Islamic Republic of	Vietnam
Sudan	Iraq	Zimbabwe
Tanzania	Jamaica	
Togo	Jordan	
Uganda	Kazakhstan	
Vanuatu	Kenya	
Zambia	Korea, Republic of	

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The climate crisis is pushing Least Developed Countries into over-indebtedness, amplifying their disparity with developed countries. Fundamental changes are needed to re-engineer, regulate, and equalise global debt and growth. Parametric insurance for sovereign debt can be one of the sustainable options for resolving the debt crisis. Insurance could cover debt repayment on behalf of the country during the period of climate crisis, helping them to focus their budget on relief and recovery, with the provision of a global fund to cover the insurance premiums.

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