Global and local, public and private: How climate-vulnerable countries can have the best in understanding risk

Global Risk Modelling Alliance

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have the best in understanding risk

To meet the goals set out in the 2030 Agenda for Sustainable Development, more financing is needed to strengthen adaptation and resilience against risks from climate change and other disasters. The increasing frequency and intensity of extreme weather events have significant impacts on lives and economic development already. This is especially true for vulnerable countries projected to experience significant additional risk in the coming years.

The need for greater financing for disaster risk reduction was highlighted at the *7th Session of the UN Global Platform on Disaster Risk Reduction* in May 2022. However, in order to develop sustainable and effective strategies to protect themselves against climate and disaster risks, countries need a comprehensive understanding of their risk, which many countries do not currently possess. As a pre-requisite of informed decisions, climate risk analysis is essential to identify existing protection gaps as well as effective climate and disaster risk financing and insurance (CDRFI) solutions.

Globally, access to risk understanding lags far behind the demand. The unequal distribution of risk understanding is a barrier to effective risk reduction and undermines sustainable development and macro-economic stability, especially in climate-vulnerable lower income countries. Insufficient local capacity also leaves many countries dependent on an imported view of their risk that lacks in-depth knowledge of either local operational contexts or the needs of the communities who live there.

New analysis[1] presented by the Global Risk Modelling Alliance (GRMA),[2] shows how using open-source risk models and freely available global data can provide the first step on a country's journey towards understanding, reducing and managing their current and projected risk. Fast-track climate risk audits conducted for Ghana and Uganda demonstrate the positive impact of investing in risk reduction using appropriate adaptation measures. Yet, as these measures will not eliminate risk entirely, the report also demonstrates how complementary CDRFI solutions can address remaining risk and fund vital response and recovery action.

The results also demonstrate why country-specific data and local expertise are crucial to gain risk insight that reflects the reality within countries and facilitate access to – and reduce the cost of – CDRFI. That is the essential next step.

Partnerships between the public and private sectors can build the capacity of governments to better understand their own risk and develop effective risk strategies that blend global best practices with local knowledge and data. This collaboration can empower governments and local institutions to take the next step and take control of their disaster risk reduction and financing.

That is why the Global Risk Modelling Alliance has been set up as a Public-Private Partnership combining private sector expertise in risk analysis with public sector operational capabilities. The goal is to help climate-vulnerable countries to build their capabilities in risk analysis, develop local risk strategies, and assess and choose CDRFI solutions adapted to their respective needs.

1. "Benefits of open risk tools for risk reduction and risk transfer policies", Global Risk Modelling Alliance and InsuResilience Solutions Fund, June 2022. Please refer to this technical report for more details and analysis on the findings summarised here.

2. The GRMA is a public-good service proposed by V20 members and co-developed with the Insurance Development Forum (IDF), funded by the German government and hosted by the InsuResilience Solutions Fund (ISF)

MAXIMISING VALUE THROUGH PUBLIC-PRIVATE PARTNERSHIPS

The public and private sectors bring complementary expertise to the challenge of increasing risk understanding and implementing effective risk reduction in the most climate-vulnerable countries. Combining them can maximise value and unlock potential.

Public sector entities bring extensive networks of operational projects and local staff working on the ground. Their experience in helping to reduce poverty, build livelihoods, prepare for disasters, and respond and recover from disasters when they happen, brings in-depth understanding of local contexts and the needs of communities.

The private sector brings expertise in risk assessment and developing financial mechanisms to transfer risk to others in the insurance and capital markets. Private sector catastrophe models, developed and improved over the last 30 years, have already proven to be a key tool in the global insurance industry's management of extreme events.

Risk analysis for the creation of disaster risk finance and insurance mechanisms has traditionally been the exclusive domain of private finance markets. To engage with international markets and develop domestic insurance markets, governments will need to communicate in the same language of risk used by the private sector. Partnerships between the public and private sectors can build the capacity of governments in this domain, allowing them to gain greater autonomy in deciding their own risk strategy.

In a virtuous cycle, increasing the quality of local risk information through public-private partnerships can reduce the cost to governments of accessing international capital, enabling increased investment in vital risk reduction, and reducing the cost of transferring the remaining risk using CDRFI.

THE POWER OF LOCAL RISK UNDERSTANDING FOR POLICY MAKING

There is growing demand for "locally owned" risk understanding to reduce risk and address the insurance protection gap that can leave climate-vulnerable countries exposed to huge losses. Local risk understanding can be applied in political decision making in many areas of government – from urban planning to agriculture, coastal development to transport. It is the foundation of effective risk strategies and policy making across government agencies and economic sectors.

Co-development of risk models through collaborative, transparent and open processes leads to better understanding and ownership of risk in vulnerable countries. It reduces reliance on global or regional data and assumptions, improves the quality of risk analysis, and builds greater trust in the methods and outputs. This can empower governments and local institutions to enact climate and disaster risk reduction, adaptation and transfer strategies.

Even a preliminary risk audit can catalyse dialogue about the risks faced, identifying regions, cities or sectors at most risk, and the "drivers of risk", including specific hazards (e.g., floods, storms and droughts) and vulnerabilities (e.g., poor infrastructure and lack of disaster preparedness). This enables governments to target further analysis and data collection, prioritise the most appropriate risk reduction strategies, and apply risk understanding in their National Adaptation Plans, Disaster Management Plans, and other policy levers.

Being based on global data and assumptions, the model uncertainty of this type of analysis is relatively high, which would translate into both challenges in accessing capital and a higher cost of that capital. However, recognising the limits to currently available information (observation data, records of disaster impacts, etc.), can itself catalyse investment in the data and analysis needed to improve the quality of risk insights over time.

Deeper, more localised analysis can facilitate benefit-cost assessments of different adaptation measures, the assessment of fiscal stability, and the planning of disaster risk financing strategies that maximise the benefits of budgetary measures, contingent risk financing, and market-based risk transfer.

RISK ANALYSIS TO INFORM CLIMATE POLICY

Risk analysis can help answer key questions related to managing disaster and climate risk:

- What is the present risk posed by disasters and how might that risk change in the future with climate and socio-economic change?
- What actions can be taken to prevent and reduce that risk to minimize financial losses and impacts on society?
- Which potential actions are most cost-effective and provide the greatest benefit-cost ratio?

By applying insurance methodologies to communicate risk in terms of the Annual Average Loss (or cost of damages), and the maximum potential loss in a given time period, that risk can be given a "price". This price is used to set insurance premiums, but it can also be used to compare the efficiency of different types of CDRFI and investments in risk reduction and adaptation.

Investment in risk reduction measures can potentially reduce the price of insurance. The reduced risk (i.e., reduced annual losses) resulting from improving the building stock through flood or cyclone proofing, for example, can be reflected in a lower price for purchasing risk financing.

The insurance sector has quantified risk in this way for decades and has invested in the data, models and capability needed to perform complex risk analysis. The development of local risk understanding to apply such analysis in low- and middle-income countries can inform climate policy and result in outputs that are more cost-effective and relevant to the local context than if produced remotely by international partners. This is another way that governments can gain greater control over their disaster risk reduction and financing and secure better outcomes for their citizens.

LEVERAGING PRIVATE CAPITAL FOR CLIMATE FINANCING

Private sector finance can help countries meet the Sustainable Development Goals and national climate commitments, but improved risk understanding is essential to effectively access that finance.

Accepting risks in climate-vulnerable countries can be attractive to international investors, insurers and reinsurers. However, a lack of local risk insight can reduce confidence in what risk is being taken on. This can prevent those risks being placed in the international market or result in a high premium being charged to cover them, to compensate for the uncertainty. Quantifying risk using established, market-accepted approaches gives private entities increased confidence to accept those new risks, and at a lower cost, releasing much-needed capital into the development and humanitarian sectors.

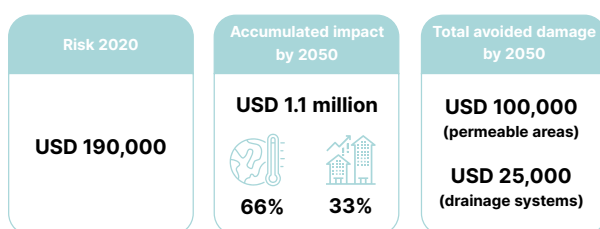## BENEFITS OF CLIMATE RISK ADAPTATION AND FINANCE IN VULNERABLE COUNTRIES

To illustrate the crucial role of risk understanding in developing climate policy, the GRMA uses the example of flood risk to building stock and public infrastructure in Ghana and Uganda to demonstrate how climate risk analysis can be used by countries to develop holistic risk management strategies. The tools applied here not only allow countries to prioritise and define effective climate adaptation and risk reduction policies but also reveal how remaining risk can be addressed with complementary CDRFI. The analysis was produced using off-the-shelf global models, in the absence of local data, to demonstrate what is possible right now, with a limited budget, in a risk data-poor context.

Expected damages and losses are quantified for floods under different climate and socio-economic development paths up to 2050, measured in terms of Average Annual Loss (AAL) representing the cost of damage to buildings and number of affected people. Under the IPCC 8.5 degree warming scenario, the national economic impact of flooding in Ghana will increase by a factor of 30, and in Uganda by 100, compared with historical losses. These estimates are based on the effects of climate and also on socio-economic growth. However, the drivers of this increase, and therefore the choice of effective adaptation measures to reduce this risk, differ significantly from place to place within each country. While flood
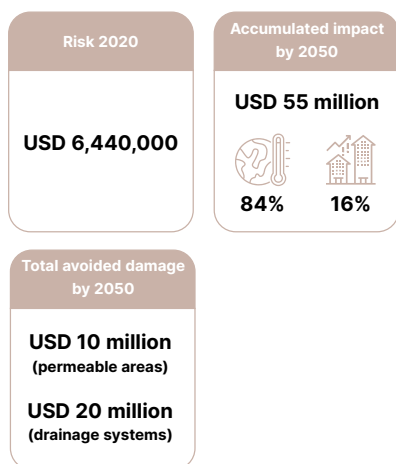
impacts are expected to increase by a factor of 23 in the region of Accra, for example, the region of Upper East and North East Ghana will see flood impacts increase by only 6 times by 2050.

The analysis shows that there is no "one-size fits all" solution to defining adaptation measures and highlights the importance of understanding local contexts. For example, across the three regions of Ghana analysed, the benefit-cost ratio of increasing permeable areas varied between 0.1 and 2.6. In all regions of Ghana, the creation of detention ponds resulted in a greater reduction of loss than improving river embankments, while in Uganda river embankments resulted in the greatest reduction. Increasing permeable areas and rehabilitating drainage systems were consistently the most effective measures in all five regions analysed (see figure below for more details on the assessment in Ghana). Ultimately, local factors – such as the type of hazard, level of existing risk, and expected future change in risk – will determine how effective different measures can be, and how much remaining risk will need to be addressed with CDRFI solutions.
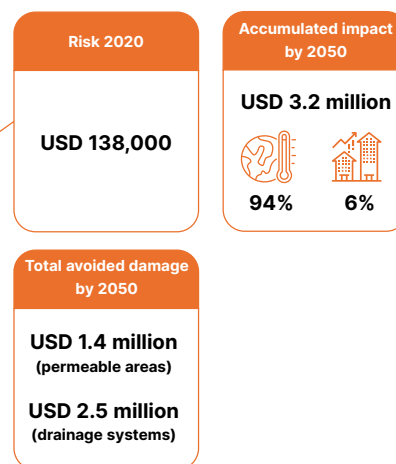
Upper East and north East

Risk 2020	Accumulated impact by 2050	Total avoided damage by 2050
USD 190,000	USD 1.1 million 66% 33%	USD 100,000 (permeable areas) USD 25,000 (drainage systems)

Western

Risk 2020	Accumulated impact by 2050
USD 6,440,000	USD 55 million 84% 16%

Total avoided damage by 2050

USD 10 million (permeable areas)

USD 20 million (drainage systems)

Accra

Risk 2020	Accumulated impact by 2050
USD 138,000	USD 3.2 million 94% 6%

Total avoided damage by 2050

USD 1.4 million (permeable areas)

USD 2.5 million (drainage systems)

Summary of risk in 2020, the accumulated impact of disasters by 2050 (and the relative contribution to increased risk from climate change and socioeconomic change), and risk reduction (avoided damages) of selected adaptation measures in three regions in Ghana.

Adaptation measures and CDRFI investments can work together to reduce the impacts of disasters on vulnerable countries. CDRFI is useful for managing the risk that remains after the effects of adaptation, and can provide funds to help people, businesses and economies to recover more effectively after disasters strike. Using simplified assumptions of premium cost for insurance of event losses with annual probability of between 1% and 10% (1 in 10-year to 1 in 100-year return period), it is estimated that adaptation measures could reduce the cost of insurance in 2050 for Western Ghana by 65%. However, the increased risk in 2050 compared to today means that, even with the effect of adaptation, CDRFI in 2050 would likely need to cover even more frequent losses to avoid a funding gap.

In the analysis of both Ghana and Uganda the impact of adaptation is clear: reducing climate risk via adaptation does not remove all risk, but it should make any complementary CDRFI cover more affordable.
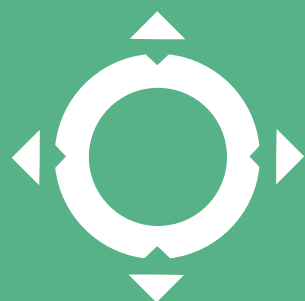
NEXT STEPS

Despite the valuable insights presented, this rapid climate and insurance analysis of Ghana and Uganda does not represent a locally informed and locally owned view of risk. In fact, the results demonstrate why country-specific data and local context are so crucial to gain more in-depth risk insight that reflects the reality and needs of specific countries. However, this analysis does provide information to catalyse dialogue and demonstrates the potential for initial risk understanding and exploration of adaptation and CDRFI benefits to be generated quickly.

The next step after such an analysis is to improve the risk insights by co-developing more localised data and models with country partners.

The GRMA programme is designed to help countries take this step. It will enable them to understand their own risk and design their own risk adaptation and transfer strategy, and to improve the quality of the risk analysis through integration of local knowledge and data. It will give risk-holders the tools they need to analyse their risk and communicate with international risk finance providers to improve the efficiency of transferring remaining risk. And ultimately it will help improve the availability and affordability of CDRFI solutions for vulnerable countries and communities.

Global Risk Modelling Alliance

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