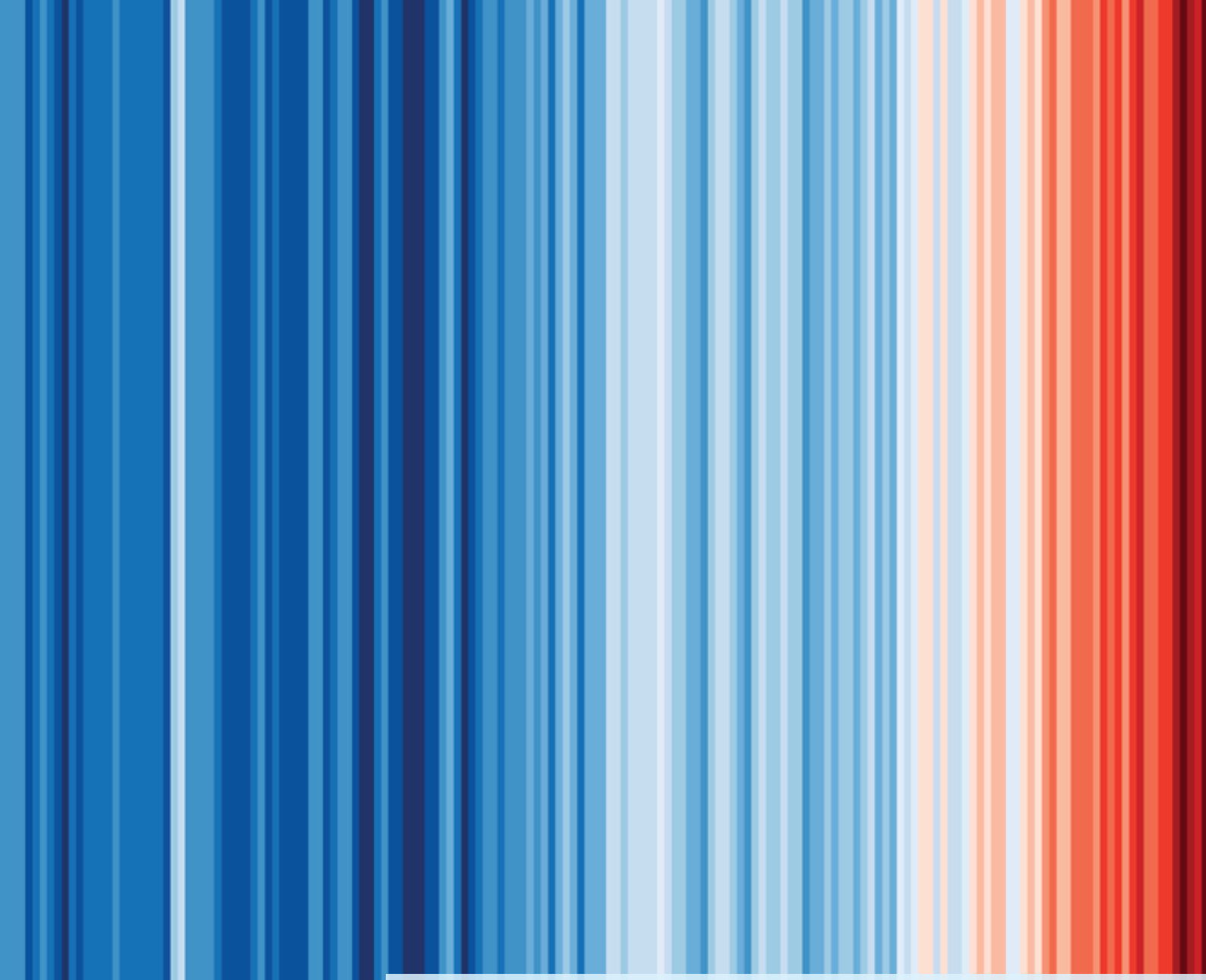

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Funding OUR FUTURE

Unlocking Resources for Adaptation Financing

Gopalika Arora

Editor

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On the cover: 'Warming stripes'. These stripes are a visual representation of the temperature changes globally over the last century. The shift from predominantly blue to red stripes highlights the urgency of climate change. Created by Prof. Ed Hawkins, University of Reading, UK. The image is used under CC-BY4.0 licence, and was accessed here: #ShowYourStripes.

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Foreword

CLIMATE CHANGE HAS EMERGED as one of the planet's biggest challenges, imposing unfortunate externalities on economic growth. The impact of this crisis is felt worldwide, but more acutely in the Global South, as these nations remain the most vulnerable and least resilient. This makes climate change not only an environmental issue but a social one too, as it disrupts fundamental aspects of human existence and hinders the provision of essential goods such as food, healthcare, and energy. India's plans for food security, energy security, and economic stability must therefore consider its impacts.

Policymakers and elected representatives in India are aware that the country is at the frontlines of this battle. Many Indian communities are particularly vulnerable, as their capacity to adapt to climate change is severely limited by overstretched state capacity and limited access to finance. This is a challenge they share with many other parts of the Global South.

As awareness of the physical, transitional, financial, and social risks posed by climate change grows, adaptation has rightfully taken centrestage as the imperative for countries of the Global South. From subnational to global levels, the adaptation challenge spans regions and sectors, demanding coordinated action and innovative solutions. While various measures can be undertaken to address the risks associated with climate change, many of these require substantial financial investments, which are difficult to mobilise given the dual mandates facing governments in the Global South—i.e., fostering economic development and addressing climate change.

A number of climate-related global commitments and pledges have already been made; just as many have been ignored. The developed world promised US$100 billion annually towards climate finance as part of the Paris Agreement. The pledge has yet to materialise, even as calls for emerging and developing economies to scale up investments in adaptation, natural capital, mitigation measures and greening the energy sector continue to grow louder. When the financing does flow, it may not come from public funds or at the expense of traditional development assistance. Further, given that there are no official guidelines on what constitutes climate finance, the ambiguity and lack of globally consistent standards result in funding being provided for reasons other than adaptation activities.

The 2021 Glasgow Climate Pact recognised the necessity of prioritising adaptation and urged developed economies to at least double their adaptation finance for developing countries from 2019 levels by 2025. This was in response to concerns that developing countries are struggling to meet their anticipated investment needs of US$130–US$415 billion annually by 2030.

Indeed, the global adaptation funding gap continues to widen at alarming levels. The factors include the difference between expected and realised returns from green investments, a limited shelf of bankable projects delivering high returns, limited capabilities of emerging economies to design and implement large-scale projects, accelerating climate impacts, and relatively slow growth in adaptation finance flows. As climate-related risks and impacts intensify, all countries face mounting pressure to invest in adaptation.

At more recent international climate negotiations like COP28, there was a palpable sense of anticipation regarding the adoption of a global adaptation goal. Although the outcome established a time-bound objective for adaptation action, it lacked quantified targets and adequate financial support. This shortfall is not unprecedented, as previous efforts to bolster adaptation have encountered similar challenges, primarily due to the localised and context-specific nature of adaptation measures. Unlike mitigation initiatives, whose returns are quantifiable and foreseeable in the near term, adaptation initiatives do not lend themselves to such straightforward assessments. Additionally, the public good nature of adaptation efforts deters private sector investment. Consequently, public financing, both international and domestic, remains the cornerstone of adaptation funding.

Moreover, as highlighted earlier, a persistent question remains: What counts as adaptation activity? The lack of an adaptation taxonomy, vagueness and equivocation around definitions leads to the absence of a shared understanding of requirements and capacities among investors, policymakers, and scholars. A large proportion of India's public money is already provided for activities, from the expansion of irrigation infrastructure to broader rural community resilience. This is motivated by the need to adapt to the effects of climate change.

This compendium published by the Observer Research Foundation brings together a diverse cohort of analysts and practitioners from different geographies to cover a wide range of issues and opportunities for harnessing greater flows of adaptation finance for developing economies. It examines the role of taxonomies, frameworks, and risk assessments; elucidates strategies to mobilise private sector finance for adaptation; and explores the role of multilateral finance institutions and mechanisms. It also delves into the modalities of loss and damage finance.

It is our hope that this collection of essays will enhance and streamline the efforts of development and climate professionals, policymakers, and investors in channelling increased financial flows towards adaptation. In this regard, it is useful to note that the Budget speech of the Indian Finance Minister for the financial year 2024-25 commits the Government to develop a climate finance taxonomy.

Looking ahead, challenges in this domain are expected to persist. Amidst sluggish global economic growth and increasing debt burdens, there is a pressing need to

explore novel and innovative approaches to these challenges. It is imperative for bilateral agencies, development finance institutions, multilateral development banks (MDBs), and climate funds to work more systematically with the beneficiary countries to boost the availability and mobilisation of adaptation finance. By strategically leveraging international public finance, we increase the chances of catalysing greater private-sector investment. However, it must be said that an international effort of this magnitude must be met through sovereign and multilateral efforts. The private sector has no track record of financing public goods sustainably at a reasonable cost.

To the extent that publications such as this compendium can make a difference to this track record, they would have served a useful purpose.

- V. Anantha Nageswaran
Chief Economic Adviser, Government of India
September 2024

Editor's Note

Gopalika Arora

THE CLIMATE CRISIS HAS EVOLVED from a looming threat to an undeniable reality that demands immediate attention. The compounding and cascading effects of climate-induced extreme weather events are increasingly being felt worldwide, with their growing frequency and intensity resulting in devastating loss of lives and livelihoods. Developing countries already burdened by economic disparities find themselves especially exposed to the escalating risks posed by climate change. Over 80 percent of the weather-related hazards reported in Asia in 2023 were floods and storms, affecting more than nine million people.[1] In Africa, climate-related disasters annually diminish the GDP by 2–5 percent.[2] As we increase our efforts to curb emissions, it is crucial to simultaneously invest in building climate resilience and adapting to the changes underway. Equally important is ensuring that financial resources are deployed effectively, reaching the most vulnerable communities to maximise their impact on the ground.

Adaptation finance has long been the neglected sibling of development and transition finance, facing challenges on both the

demand and supply sides. In developing countries, the projected cost of adaptation is estimated at US$215 billion annually for this decade, while the finance needed to meet domestic adaptation needs stands at US$387 billion per year.[3] Despite these pressing needs, public, multilateral, and bilateral adaptation finance to developing countries dropped by 15 percent in 2021, reaching just US$21 billion.[4] This shortfall, coupled with rising adaptation demands, has widened the current adaptation finance gap to an estimated US$194–366 billion per year.[5]

While adaptation finance can originate from both public and private sources, the vast majority has so far come from public funding. In 2022, the private sector contributed US$2 billion—representing a mere 2 percent of tracked adaptation finance.[6] This scarcity of private investment stems from well-documented challenges in tracking private adaptation finance as well as enduring barriers that inhibit private-sector engagement in this area.

Adaptation projects have historically struggled to secure financing compared to their mitigation counterparts for several reasons. First, mitigation investments tend to yield quicker returns, whereas the benefits of adaptation efforts are often realised over a longer timeframe. Second, the intrinsic 'public goods' nature of adaptation diminishes the private sector's interest in investing.[7] Additionally, aligning adaptive capacity with investors' risk and return expectations poses a significant challenge. The absence of a clear taxonomy for climate adaptation adds to the uncertainty, as there is no unified definition of what constitutes an adaptation activity. Furthermore, weak governance standards can lead to the misallocation of funds towards personal interests and maladaptation, exacerbating the plight of vulnerable nations.

Against this backdrop, this compendium, *Funding the Future: Unlocking Resources for Adaptation Financing*, brings together researchers and practitioners from around the globe to explore key issues and opportunities for increasing adaptation finance flows to developing economies. This collection of essays offers a comprehensive guide to innovative ideas and mechanisms that can help elevate adaptation finance within the broader climate finance agenda.

The volume opens with an essay by *Mikhail Korostikov*, who argues for a sector-specific framework for adaptation finance. The current diversity of interpretations and fragmented markets create confusion for investors. A localised adaptation finance

taxonomy would establish clear standards, enabling investors to compare opportunities and better assess environmental impacts.

The second essay, authored by *Suranjali Tandon*, highlights the critical role of domestic public funding—often fully supported by national and state budgets in driving adaptation initiatives. Public finance management systems can also act as catalysts for mobilising private finance for climate action. Given the importance of the Union Budget as a policy tool reflecting government accountability and priorities, integrating climate-responsive budgeting is imperative.

Paul Horrocks and Jens Sedemund then investigate the challenges that confront investors when financing adaptation projects. They highlight the potential of performance-based sustainability-linked bonds as a forward-looking instrument for attracting private investment.

In their piece, *Somit Dasgupta, Amrita Goldar, Sajal Jain, and Diya Dasgupta* discuss the role of innovative financial instruments and mechanisms in unlocking private investments and increasing the funding required to meet climate adaptation goals.

My essay then follows, focusing on mobilising the private finance for ecosystem-based adaptation through nature-based solutions. These approaches offer cost-effective and sustainable alternatives that complement national and subnational adaptation strategies. By leveraging the inherent benefits of nature, these solutions aim to tackle climate change, combat biodiversity loss, and mitigate land degradation, all while advancing sustainable development objectives.

In the sixth essay, *Adele Tanguy, Alexandre Magnan, and Lola Vallejo* examine the current strategies employed by multilateral development banks and the challenges they face in measuring the climate effectiveness of the adaptation financing they provide. It also investigates how innovative assessment methods could address these challenges.

It is followed by an essay by *Tom Kerr and Daphne Basangwa* which focuses on established financial instruments and de-risking mechanisms that can support adaptation financing.

Ornela Çuçi then offers her perspective on the current landscape of adaptation finance, and argues that it is at present marked by fragmentation. This fragmentation, characterised by diverse operational approaches, results in high transaction costs, a lack of unified goals and targets, varying application processes, and inadequate standardised monitoring and evaluation. These issues collectively undermine the overall effectiveness of climate finance initiatives.

In the penultimate essay, *Vera Songwe* explores the adaptation financing needs of African nations. *Nivedita Joshi and Harjeet Singh* close the contributions with an essay that addresses the progress and realities surrounding Loss and Damage (L&D) finance.

Nilanjan Ghosh rounds up the volume with his concluding essay, which underlines that the imperatives for adaptation financing are both epistemological and ethical.

As we strive for a resilient future, navigating the complexities of climate adaptation financing can feel like walking a tightrope. This compendium aims to serve as a beacon to illuminate the critical opportunities and challenges in mobilising public, private, and multilateral finance for climate adaptation.

I extend my heartfelt gratitude to all the authors for the valuable knowledge and insights that they have shared in their contributions to this compilation. Their unwavering commitment to the pursuit of climate resilience shines through in the depth of their research and the visionary perspectives articulated in their essays.

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Mobilising Adaptation Finance: The Case for an International Adaptation Taxonomy

Mikhail Korostikov

GLOBAL EXPENDITURE ON CLIMATE CHANGE adaptation is estimated to be up to 18 times less than required.[1] This disparity is even more pronounced than in the case of mitigation finance, which is already insufficient to meet the goals set out in the Paris Agreement.[2] Analysis by the Climate Bonds Initiative has found that only 19 percent of sustainable bonds issued worldwide by the end of 2022 were partially directed towards adaptation initiatives.[3] The underinvestment in adaptation projects can be attributed to multiple reasons, of which the OECD has identified 12 primary factors.[4] These reasons can be grouped into three themes.

First, countries most in need of climate adaptation often lack sufficient budgetary resources to implement relevant projects. According to the Notre Dame Global Adaptation Initiative Index,[5] the threat from climate change and the requirement of adaptation increase in a near-linear fashion with the decline in a country's income, highlighting the Global North-South divide.

Second, the lack of funds is compounded by poor institutional capacity to request adaptation funds from international donors and foundations. This challenge is exacerbated by the lengthy approval cycle within donor organisations, which often results in project funds becoming available well after a country's priorities have shifted.

Third, and perhaps the most acute challenge, is the lack of a common approach to measuring adaptation, the vagueness of definitions, and the absence of a common understanding of needs and capabilities among investors, policymakers, and scientists. A qualitative improvement in this area is not possible without clear definitions and an accurate assessment of how to calculate the risks and benefits of adaptation projects. The lack of standardisation in adaptation turns it into a private matter for local communities, which often lack the financial and technological resources to implement long-term projects. The lack of unified approaches leads to international funds, investors, and philanthropic organisations investing in simpler and more understandable mitigation, with a focus on areas such as transport and energy.

A credible international adaptation taxonomy or commonly used taxonomical principles in the area could be a solution. Green finance taxonomies have proven effective in climate change mitigation. These taxonomies serve as guides for market participants, allowing them to separate climate-positive projects from others and gain assurance against greenwashing.[a] National taxonomies are rarely free from the influence of politics and lobby groups. However, their level of credibility allows international investors to identify, verify, and invest in projects. Currently, taxonomies have been developed or are being developed in more than 40 countries and regions[6] of the world, including the European Union (EU),[7] China,[8] Russia,[9] and ASEAN countries.[10]

Climate Adaptation in Existing Taxonomies

Almost all developed taxonomies include activities related to climate change mitigation as well as other environmental objectives, including adaptation to climate change, although the latter is not well developed. For example, the taxonomies of Thailand[11] and Colombia[12] indicate that adaptation activities will be incorporated as climate science. In the EU taxonomy, which is mitigation-focused, adaptation criteria are

a 'Greenwashing' is the practice of misleading consumers by falsely portraying products, services, or companies as environment/climate friendly when they are not.

supplemented by 'do-no-significant-harm' rules aimed at preventing maladaptation.[b] These criteria serve as a stopgap for future developments in the domain.

The UNDP's Climate Change Adaptation Program[13] offers country- and sector-based studies that combine climate zones with available solutions. In 2020, the World Bank published guidelines containing six adaptation principles for the development of a robust adaptation taxonomy.[14] Despite credible adaptation principles and technologies, however, adaptation taxonomy development lags behind mitigation taxonomy. This can be attributed to various reasons.

First, adaptation is more country-specific than mitigation, and therefore draws less attention from international investors. Greenhouse gas emissions affect all countries, regardless of the source of the emissions, which motivates EU or US investors and philanthropists to fund emissions reductions in Africa and Asia (emissions produced in the Global South destabilise climate all over the world, including the Global North, and vice-versa). However, each country faces the consequences of climate change independently; for instance, floods in one part of the world often have little impact on another if no value chains are affected. The consequences of a lack of adaptive investments are no less severe than those of a lack of mitigation. Without sufficient investments in adaptation, many regions will become uninhabitable due to the effects of climate change, and the resulting waves of migration will cause political and economic challenges globally. A lack of adaptation in developing economies will also affect multinational businesses in these countries.

Second, countries have unique adaptation needs, and it is difficult to develop general recommendations for all. Unlike in the case of mitigation, it is difficult to arrive at a universal numerical criterion that can be used to classify an activity as beneficial for adaptation. For example, in most taxonomies, energy production that does not exceed 100 grams of CO_2 equivalent per kWh is considered to be green. However, the type of crops that farmers need to switch to in order to adapt to climate-zone changes varies across countries. This variation highlights the need for greater attention, as taxonomies are designed, specifically, to address these region-specific challenges.

b In a climate-change context,'maladaptation' refers to actions that are intended to reduce the impacts of climate change but which create more risk and vulnerability.

A Common Modular Framework

Various attempts to provide a general framework for the development of adaptation taxonomy have aimed to harmonise approaches and address the current adaptation finance crisis. For example, the Adaptation Solutions Taxonomy (AST),[15] created in 2020 by the Lightsmith Group and the Inter-American Development Bank, is focused on identifying small and medium-sized enterprises (SMEs) that offer adaptation solutions in developing countries and determining the support needs of these SMEs.[c] It is not scalable, however, and is structured around SMEs and their needs.

Another example is the Taxonomy of Climate Change Adaptation Technology,[16] developed by the UNEP Copenhagen Climate Centre in partnership with the Green Technology Centre of Korea. It aims to help "accurately understand the current status of technology demands in developing countries" and assist policymakers in defining what technologies they need to adopt to tackle certain problems. Seventy-nine technologies are recommended across six key sectors—agriculture, water, climate change forecasts and monitoring, marine economy, health, and forestry.[d] However, it does not provide a region-specific classification of technologies but prioritises technologies by their potential positive compound effect on the environment, society, and policy. The paper is also primarily based on material from the Republic of Korea and leans towards issues and technologies applicable to the region. This approach is almost exclusively applicable to policymaking and technical experts and is difficult to use in the broader market.

Additionally, both taxonomies lack quantitative thresholds and elements essential for a modern green taxonomy, such as do-no-significant-harm provisions and mechanisms to "connect" the taxonomy to the financial market.

In 2023, the Climate Bonds Initiative, in partnership with the UN Office for Disaster Risk Reduction (UNDRR) attempted[17] to create a common framework of definitions for adaptation activities. The framework[18] builds on the materials mentioned above but attempts to create a methodology for developing an investment-focused, full-scale

c AST has four elements: a definition of adaptation SMEs, eligibility criteria, classification of adaptation SMEs, and a climate resilience assessment framework for reporting results. It describes the results chain, including activities, inputs, outputs, outcomes, and impacts. Solutions are categorised by type, industry, risk type, and geographic region.

d The description for each technology contains general information, detailed technology description, the potential influence of its application on sustainable development, and its "paradigm shift potential".

adaptation taxonomy that contains all necessary elements and safeguards and serves the same purposes as the mitigation taxonomies.

The framework recommends applying future taxonomies to four types of investments: measures, assets, activities, and entities. Two options are available for each investment type: adapted investments (beneficial to the asset or activity in question) and enabling investments (beneficial to other assets or entities). For example, an adapted solution for the construction sector at the asset level would involve the installation of passive ventilation systems in buildings to maintain healthy interior temperatures during extreme heat episodes, while an enabling solution would involve the production of heat-tolerant building materials.

To be eligible, the investment must contribute to the taxonomy objectives and avoid contributing to maladaptation. The investment must demonstrate that it can directly respond to climate change impact (e.g., coastal defences), reduce pressures that exacerbate and/or are exacerbated by climate change impact (e.g., reducing water consumption in response to increasing water scarcity), or enable either of the two previous types. The investment should also not cause significant harm to other environmental or societal aspects, such as exacerbating social inequality or habitat destruction.

Furthermore, the framework proposes dividing all technologies, practices, and activities specified in the taxonomy into three categories based on the number of additional checks and criteria required. The first category comprises items that automatically fulfil the objectives of the taxonomy because the likelihood of maladaptation in their application is negligible. The second category is the “standardised checks” category, which includes investments that contribute to climate resilience and adaptation in various contexts but may cause significant harm, which must be assessed and managed. Investments that do not pass the test for inclusion in the standardised checks category fall into the further assessment category. These are investments that must be assessed against screening criteria to confirm eligibility.

Based on an analysis of existing papers on classifying adaptation activities, the framework highlights seven areas where resilience is required and where the categorisation can be applied: agrifood systems, cities, healthcare, infrastructure, industry, biodiversity, and society. The current lists of technologies, practices, and

criteria will be developed by the Resilience Technical Advisory Group under the aegis of the UNDRR, which will include representatives from NGOs, think tanks, investors, financial institutions, multilateral development banks, and rating agencies.[19] The group will work with the Resilience-Focused Bonds Issuers Club and Investors Working Group to ensure that the taxonomy is applicable to the financial market. Technical expert groups will develop all the criteria, thresholds, and metrics in line with the Climate Bonds Initiative methodology, which was used as a basis for the mitigation criteria.

Learning from Past Mistakes

Two crucial challenges associated with the development of taxonomy (i.e., international entities and nation-states) can be identified.

First, as adaptation needs vary between countries, creating a single set of practices and technologies for all nations will be difficult. This problem can be solved in two ways. United Nations (UN) agencies such as UNDP or UNEP, which are equipped to interact with both researchers and the financial market through initiatives like the UNEP Financial Initiative and are familiar with the adaptation needs of different regions, can identify climate zones with unique adaptation needs and, with support from specialised technical expert groups, develop recommendations for combining a common framework of adaptation taxonomy principles with technologies and practices specific to a climate zone. While this method would require refinement at the national level, it would remove the need for resource-constrained states of the Global South to develop a unique list of technologies and practices from scratch.

The second way is to create sector-specific but flexible criteria that can be varied according to local conditions. This approach is riskier because it creates room for abusive and maladaptive behaviour, but this risk can be minimised by proper checks and balances. Such general criteria can be developed for agricultural developments (including livestock and fisheries), infrastructure creation, land management, water management, health risk prevention, building adaptation, and others. For example, agricultural criteria could include universally applicable practices like intercropping or silvopasture promotion with some locally developed practices meant to mitigate the influence of changing precipitation patterns on local crops.

Second, the potential fragmentation due to different approaches to taxonomy development in different countries would slow the cross-border flow of capital and prevent the taxonomy from realising its full potential to reduce emissions. This problem is illustrated by mitigation taxonomies that differ in their activities and principles. Notably, the two largest taxonomies in terms of coverage, i.e., the Chinese and European taxonomies, are fundamentally different. While the Chinese taxonomy is industry-focused and includes a whitelist of approved technologies, the European taxonomy is investment-focused and includes screening criteria, a do-no-significant-harm principle, and minimum social safeguards. The International Platform on Sustainable Finance is working towards the unification of these taxonomies, but this process is not fast, and the status of the final document is unclear.[20]

The development of adaptation taxonomy can help avoid this scenario. The best option may be to entrust a single international structure with developing and upholding taxonomy principles and mechanisms. This can either be a structure like the World Bank or the International Financial Corporation, which has substantial research and outreach capacities to develop and maintain "an adaptation core" of mechanisms and practices, or an impartial UN agency like UNEP, UNDRR, or UNDP. These principles and approaches should be updated in line with recommendations for work on the United Nations Framework Convention on Climate Change global adaptation goal.

National entities like central banks and finance ministries that usually manage the development of mitigation taxonomies could also adopt this framework and, in cooperation with technical experts, identify specific technologies and activities that correspond to local conditions. This can help investors ensure that all necessary checks are in place so that, for instance, regardless of the size of the flood wall, its construction will aid adaptation without harming either the environment or the people. Therefore, the overall conceptual framework, which is aimed at ensuring transparency in the assessment process, makes it possible to integrate the national priorities of various states without compromising the system's credibility.

Additionally, national technical working groups will need to compile lists of specific technologies in accordance with the specified categories (i.e., automatically compliant, small checks, checks plus criteria) and provide recommendations for their applicability in various conditions. The resulting documents should be usable by financial market players to facilitate the issuance of adaptation financial instruments, the verification of

exchange-traded funds targeting adaptation, and the disclosure by companies investing in this area.

As climate change worsens and extreme natural phenomena become more frequent, the need for adaptation finance will increase. It will become necessary to create the conditions to reduce the impact of climate change on societies and economies, and creating a full-fledged international adaptation taxonomy can be an important step in this direction.

Mikhail Korostikov is Taxonomy Manager at Climate Bonds Initiative and is developer of taxonomies for Thailand, Hong Kong, Rwanda, Singapore, and Russia.

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Finance for a Resilient Future: Transforming Public Finance Management Systems

Suranjali Tandon

The Context

Article 7.1 of the Paris Agreement highlights the global goal on adaptation.[1] To support the work towards this goal, signatories to the agreement created the Glasgow-Sharm El-Sheikh work programme at COP26.[2] The two-year work programme was carried out by two technical bodies that support the Meeting of Parties to the Paris Agreement CMA—the Subsidiary Body for Scientific and Technological Advice and the Subsidiary Body for Implementation.[3] While the work programme highlighted that adaptation action has a time-bound goal, the adoption of the global goal at COP28 fell short due to a lack of quantified targets and financial support.[4]

Previous attempts to define the targets of adaptation have had limited success, as adaptation actions have been local and context specific.[5] While these challenges may persist, there are ongoing efforts to create indicators to measure success and collect data to support adaptation planning. Finance remains the key challenge. The COP28 decision reiterates that, by 2025,

Parties need to double their collective climate finance for adaptation to developing countries from 2019 levels.[6]

Efforts to address climate change risks have largely focused on mitigation, resulting in a shortfall in adaptation action. Consequently, the COP28 decision advocates for a balance between mitigation and adaptation.[7] According to a 2023 United Nations Environment Programme report, the financing gap for adaptation is anywhere between US$194 billion and US$366 billion per year, with developing countries requiring 10-18 times the current global public adaptation financial flows.[8]

At the international level, the number of adaptation actions supported by the Green Climate Fund (GCF), Global Environment Facility's Least Developed Countries Fund, Special Climate Change Fund, and Adaptation Fund was lower in 2022 than 2021, despite a rise in total funding.[9] The Organisation for Economic Co-operation and Development (OECD) estimates that, between 2016 and 2021, only 25 percent of climate finance, amounting to an average of US$19 billion per year, was mobilised by developed countries for climate adaptation action in developing countries.[10] Within developing countries, adaptation finance prioritised middle-income countries with large populations. Multilateral Development Banks were the largest source of public climate finance for adaptation, providing 89 percent of funding during the 2016-21 period, followed by bilateral arrangements. Financial flows were concentrated in three sectors: water supply and sanitation (21 percent), agriculture (19 percent), and transport and storage (10 percent). Loans were the most frequently used instrument, although concessional finance was also sought.[11]

Initiatives such as the 2021 Glasgow Climate Pact have attempted to remedy the shortfall in finance. The OECD Development Assistance Committee (DAC) also declared that it would strengthen support for climate adaptation and resilience in developing countries.[12] Whether these will materialise into enhanced financial support for countries in need of adaptation finance remains to be seen.

Key Challenges

Although international public finance has been emphasised as the primary support mechanism for adaptation funding, the current state of flows is sobering. The bulk of adaptation flows are concentrated in East Asia and the Pacific. While public

finance is predominant in Sub-Saharan Africa (88 percent) and the East Asia Pacific (60 percent),[13] private finance comprises the biggest share in Western Europe (54 percent), the Middle East and North Africa (56 percent), and the United States (US) and Canada (81 percent). Among public finance funders, multilateral DFIs contribute to about 63 percent of the funds.[14]

The qualitative elements of financial flows, i.e., the extent of debt and the contributions of developed countries, are also important factors. For example, there are limits to scaling up MDB finance, and deviating from business-as-usual requires a shift in shareholder expectations. Therefore, domestic resources will be key to ensuring that adaptation needs are met.

Since adaptation action is aimed at safeguarding societies and economies from the adverse impacts of climate change, it is considered to be the government's responsibility.[15] However, government expenditures are dictated by fiscal discipline. As countries work within prescribed fiscal limits, enhanced spending can only come from higher tax collections or higher borrowing for the purpose of adaptation, although the latter is less likely due to increased government debt; two years after the COVID-19 pandemic, debt levels have remained elevated, at 238 percent of global GDP,[16] despite economic rebounds and continuing inflation. Additionally, climate change has worsened the debt burden in the Global South.[17] The IMF has found that, in the aftermath of 11 natural disasters that hit developing countries between 1992 and 2016, public debt levels increased significantly and stayed elevated for three years afterwards.[18]

Therefore, countries may find it challenging to scale up finance. The alternative is reforming tax systems and/or expenditures. The reform of tax systems is dependent on a myriad of administrative, compliance, and policy factors. In many developing countries, which experience sharp economic slowdowns and resource/capacity constraints, the ability to raise taxes may be limited. The United Nations Development Programme's financing SDGs program provides a framework for tax reforms.[19] In the short term, better fiscal management, i.e., assessment of expenditures and tagging of adaptation spend, may be more effective. State governments in India, including those of Maharashtra, Assam, Chhattisgarh, Bihar, Odisha, and Kerala, have incorporated climate budgeting in the public finance management,[20] with Odisha being the first Indian state to disclose sector-wise budgetary requirements and the climate sensitivity of the budget.[21]

Recent efforts have aimed to ensure corporate and private-sector support for adaptation action. For example, the ACT Adaptation methodology provides a framework for physical climate risk assessments.[22] Another way for scaling private finance in a space that is largely considered the domain of public finance is through the proliferation of insurance-based products. The OECD provides a useful framework for sectors where commercial finance may be more suitable. Table 1 provides a list of adaptation-related activities and potential sources of finance. The shaded boxes represent the kind of finance available for a particular activity. Commercially viable capital may be available for credit and insurance, consultancy services, afforestation and reforestation, water-efficient irrigation, changes in production towards better adapted crops, and disaster-resilient infrastructure spend. A large share of adaptation-related activities require either public funding or below-market financial returns. Therefore, it is imperative to devise instruments to scale public finance.

Table 1: Adaptation Activities and Expected Financial Returns

Adaptation activity	Examples of activities	Usually publicly funded	Mixed (Below-market)	Commercially viable
Enabling environments	Development of national adaptation plans and strategies	■		
	Provision of climate-related data and risk maps	■		
	Implementing early warning systems covering climate-related events	■		
	Development of new technologies and services for adaptation		■	
	Development of financial services to support adaptation (e.g., credit and insurance)		■	■
	Consultancy services for adaptation			■

Adaptation activity	Examples of activities	Usually publicly funded	Mixed (Below-market)	Commercially viable
Agriculture	Afforestation and reforestation			
	Changing production towards better-adapted crops and varieties			
	Installing water-efficient irrigation			
Coastal zones	Restoration of coastal wetlands			
	Relocation of properties from high-risk areas			
	Beach nourishment			
	Flood defences			
Infrastructure	Integrating climate resilience into new infrastructure			
	Increasing backup systems in infrastructure networks			
	Making existing infrastructure resilient			
Water	Expanding water storage capacity			
	Desalination			
	Reducing leaks in existing infrastructure			
	Protecting watersheds			
	Improving water efficiency of major water users			

Source: OECD[23]

Solutions Beyond Public Finance

Despite growing pressure on developed countries to pay their fair share of the required adaptation finance, a more pragmatic approach may be to acknowledge

that domestic resources will be the first, if not only, source of capital. Responding to urgent adaptation needs would require emergency access to funds. The GCF has been a crucial source of emergency relief funds. Launched in 2021 to shield clean energy companies in developing countries from COVID-19 shocks,[24] the GCF has been accessed by countries such as India,[25] although the provision has been slow and the process complex.[26] Moreover, even as we approach the deadline for a new collective quantified goal, there is less agreement on the appropriate share of finance from developed countries. Although the loss and damage fund at COP28[27] holds promise, more strategic ways to tap into funds beyond pure play budgetary allocation are required.

Insurance

Insurance emerged as a preferred instrument after developed countries expressed their discomfort over the use of the term 'compensation' in the Paris Agreement.[28] At COP21, loss and damage was a highly debated topic, with developed countries refusing public international climate liability or any reference to compensation.[29] The Agreement was then modified to include terms such as "Comprehensive Assessment and Management" and "Risk Insurance facilities, climate risk pooling and other insurance solutions".[30]

There have been multiple efforts to fund insurance in vulnerable countries. The US announced US$30 million[31] for a climate risk insurance initiative, and the G7 announced public funds to support the InsuResilience initiative.[32] The InsuResilience Global Partnership supports programmes and projects related to the Climate and Disaster Risk Finance and Insurance (CDRFI), with 324 projects in 108 countries. The Global Shield Program launched at Sharm El-Sheikh by the G7 aims to support the most vulnerable countries. In its initial phase, it supported Bangladesh, Costa Rica, Jamaica, Malawi, Pakistan, the Philippines, Senegal, and the Pacific countries.

Insurance, unlike other international funding facilities, ensures fast access to funds. A notable example is the CCRIF PCS,[33] which assists Caribbean countries in the case of natural disasters that include hurricanes and excess rainfall. This is a parametric insurance facility that helps subsidise insurance policies. For example, in 2023, the European Union (EU) provided CCRIF with US$4.7 million to support 12 Official Development Assistance-eligible Caribbean members.[34] It is estimated that,

through the World Bank-administered programme, the EU enabled discounts of 14 percent on gross premium.[35]

Parametric insurance—which is insurance against the probability or threshold of an event as against the occurrence of the event—can help insure against disruptions to business-as-usual. However, countries seeking to use this as a funding option need to consider the fact that the premium and the terms and conditions are not fixed and can contextually differ. Such a product can be useful not just for the flow of international finance but may also be used at the national or subnational levels with potential for public-private partnerships. Examples in India include pilot crop-based insurance in 50 districts during 2007-16 and Nagaland's financial protection against excess rainfall.[36] Given the potential for risk sharing, it is possible to explore the potential for supporting vulnerable communities and disaster management by pooling public funds with private funds.

Regulatory changes

Public funding has limited fiscal space to implement insurance-based schemes on a wider scale. Therefore, private finance may still be necessary to fund adaptation, though it may not be easily available. To nudge private capital to move into adaptation activities, it may be important to demonstrate the risks from inaction to businesses. This would ensure that economic activity is organised so that risks arising from extreme weather events may be mitigated to some extent. In countries such as India, which place greater reliance on bank-based financing, it is expected that the flow of funds to higher risk activities can be moderated. The disclosure of physical risks to central banks is one of the ways in which banks can compel businesses to change their investment and operations. While existing business disclosures such as ACT are already addressing adaptation, a shift in banking-sector disclosure requirements may enable debt-based financial flows to better align with adaptation goals.

Conclusion

Public finance is considered to be the mainstay for adaptation finance at the international and national levels. However, given the slow global growth and debt buildup, there is need to rethink ways of funding the gap between the required adaptation finance and what public finance can provide. While the global goal for adaptation has received widespread support, the commitment on finance remains

unclear. In these circumstances, countries can pursue the long-term goal of revenue and expenditure reforms. However, time is limited as costs for adaptation continue to accumulate. In this context, practices such as budget tagging and the climate risk assessment of budgets provide a way forward. More importantly, the use of instruments such as parametric insurance, which is a form of concessional international public finance, may be a viable option for financing adaptation, as has been the case in the Caribbean countries. Lastly, reforming business-as-usual would necessitate regulatory changes such as the disclosure of physical risks.

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Unlocking Private Finance for Adaptation: Challenges and Solutions

Paul Horrocks and Jens Sedemund

AMID BROAD CONSENSUS ABOUT THE URGENT need to scale financing for adaptation, there is also agreement that unlocking private finance for adaptation has to be part of the solution. At the same time, there are concerns that private finance for adaptation falls short of the needs. For example, data from the Organisation for Economic Co-operation and Development (OECD) finds that, of the US$120.8 billion in private finance mobilised for climate action during 2016-21, US$97.7 billion (81 percent) targeted climate change mitigation exclusively, US$9.5 billion (8 percent) supported both mitigation and adaptation objectives, while only US$13.7 billion (11 percent) was mobilised exclusively for adaptation.

Adaptation finance may suffer from private finance being viewed through the lens of project finance. Additionally, a focus on delineating adaptation finance may detract from the original goal of unlocking more finance for adaptation. The challenge of private investment and finance is less due to the specificities of climate change adaptation and more a reflection of the financing constraints experienced by developing countries.

The Investment Perspective

Low levels of private finance for adaptation are at odds with findings that private businesses adjust their business operations and practices in response to a changing climate, i.e., by investing in adaptation. However, businesses, especially Micro, Small and Medium Enterprises (MSMEs), often make these investments to serve their business interests rather than as conscious measure towards adaptation.[1,2]

To remain viable, businesses must continuously adapt to a changing external environment and various factors, including climate change, evolving terms of trade, technological progress, and changes to demand and competition. The market aims to incentivise effective solutions and replace inefficient adaptation, investments, and practices such that well-adapted businesses continue to be profitable.[a]

Adaptation activities at the firm level may materialise as either dedicated activities towards achieving greater resilience—such as changing crops or protecting production lines—or as activities that enable adaptation, including developing early warning systems or weather forecasting operations.[3,4] However, with private enterprises adapting their business practices to sustain profitable operations, their standard investment will not be in project finance but will take place on the balance sheet.

As private investors seek to finance adaptation projects, project finance seems to be the inevitable option. Project finance is often directed towards large-scale infrastructure that is planned, constructed, and operated with the help of special purpose vehicles (SPVs).[5] SPVs serve a single purpose, such as the construction of a discrete infrastructure asset for the production and provision of renewable energy. While project finance is a common approach in official development finance, it is a highly specific area that is limited to infrastructure financing and, where private investors are involved, typically implies public-private partnerships.

The most common way for private enterprises to raise funds via the balance sheet is as either equity or debt: financing is raised at the corporate level and not for a

a As with other factors shaping private business responses to market dynamics, the process of responding to climate-related risks and opportunities may generate responses that are rational for the firm but ultimately result in overall economically inefficient or undesirable outcomes. Public policy plays a central role in setting markets that avoid negative externalities and support market outcomes are effective and efficient for economies and society overall (Mullan 2022).

specific project. Access to external finance is necessary to ensure that businesses can adapt to climate change when internal funds prove insufficient. However, it is rare for a private enterprise to seek adaptation finance. Similarly, efforts to raise debt capital for adaptation investments would typically be part of broader corporate finance efforts. That is, for every loan application that a bank receives, a creditworthiness assessment (or rating, in the case of large corporates) of the enterprise and its underlying business operations will be carried out, including screening the application against climate change risks to understand whether they can adapt to future changes.

There is both a clear economic rationale as well as qualitative and quantitative evidence of private investment in adaptation, especially at very high aggregate levels. However, the processes around private investment make it nearly impossible to delineate and trace. Access to finance is a key factor and service input for private sector productivity[6,7] and therefore for adaptation activities, enabling growth in a changing environment.[8,9] However, informal MSMEs continue to find it difficult to access finance for climate-related projects and other purposes.[10]

The Financing Perspective

Despite the inherent rationale for private enterprises investing in adaptation, the supply of finance for such investments remains a challenge. Similar to enterprises adapting to optimise their performance, external financiers would prefer to invest in businesses that are well adapted. For example, adaptation projects in an agricultural corporation in Africa will typically be part of maintenance and development in business operations. Investors fund such activities as they are considered to contribute to the bottom line, where adaptation may be challenging without an SPV.

The supply side of finance generally aims to invest in products that contribute to climate and sustainability objectives: financial products that have a sustainability dimension are heavily oversubscribed compared to products without a sustainability focus. This reflects the existence of supply-side finance, with excess supply often translating into a slightly lower premium, i.e., the “greenium”, for the issuer.

The use of greenium is evident in the green, social, sustainability and sustainability-linked bonds for both corporates and sovereign issuers.[11] An improvement in yield for the issuer has been observed in developed markets, notably in Germany’s twin

bond structure, where comparable green and non-green bonds are issued at the same time. Among developing countries, Egypt, Thailand, Indonesia, and Chile have also experienced a greenium.[12] Whether the issuance is placed in hard currencies and international markets or local currencies in local bond markets can affect the existence and size of the greenium; the greenium is often higher in the case of the former due to higher interest in SDGs- and ESG-related investment opportunities from international investors.[13] International investors will typically prefer hard currency bonds due to the depth and size of these markets. The greater the number of bidders at the auction of bonds, the more likely that there is a greenium, as greenium is created by excess interest from investors in the issuance.

The future will be defined by supply and demand as well as by policy messaging around the sustainable transition of economies. However, one common argument is that many investments cannot be financed because they do not generate a cash flow; for example, a seawall for enhanced flood protection will not generate revenues that can be used to repay external financing. Therefore, a large share of adaptation action will need to take the form of climate-resilient infrastructure that are an inherent domain of public investment. Mitigation-related infrastructure, especially in the energy sector, is often bankable, but this is an exception to the rule; they are not purely private and rely on PPP arrangements, while providing the basis for private investment and financing.

At the core of public investment is its ability to generate economic benefits. While these benefits may not generate direct cash flow that can be modelled into financial returns for a particular investment, they underpin overall economic activity that contributes to economic growth. This further translates to growth in the tax base and enhanced government revenue. This in turn allows for public investment to be financed by using sovereign debt, with the enhanced government revenue being used to repay the debt.

There is a quasi-unlimited supply of private finance for public investment through sovereign debt issued in capital markets. High-income countries do not face problems in mobilising resources from capital markets. Countries should be rewarded for investing in adaptation as such investments are aimed at optimising the performance and resilience of their economies against climate change impacts. However, rather than experiencing constraints to potential supply due to adaptation-specific factors,

developing countries are unable to tap into private finance seeking to allocate investments for adaptation purposes. It is not clear whether there are specific constraints to financing adaptation; rather, these constraints are defined by the development context of a country.

The key constraints to public and private investment for adaptation in developing countries are the limited development of their financial systems and the associated high costs of capital.[b] Developing countries often lack the capital to fund public infrastructure projects for adaptation at scale and therefore require international capital, which creates additional constraints for investors, such as political and foreign exchange exposure.

In order to unlock private finance, the focus should be on increasing the availability of finance in developing countries—i.e., on unlocking more finance for adaptation rather than tightly ring-fencing adaptation investments[14]—and reducing its cost. Finding ways to ensure clear adaptation or resilience will be key for providing incentives to the public or private issuer or recipient and to generate a mechanism to respond to the supply-side opportunity. It also needs to be noted that private and public investment depend not on the product but on the level of interest on the part of the private or public investor.

Leveraging Sustainability-Linked Bonds

Sustainability-linked bonds (SLBs) highlight how funds are raised and spent for private and public investment in accordance with sustainability and specific adaptation incentives and benchmark.[15] SLBs are a forward-looking performance-based instrument wherein issuers commit to future improvements in sustainability outcomes within a predefined timeline. Proceeds raised through SLBs do not have to be directly used for green or social assets or projects. However, they relate to the performance of certain sustainability key performance indicators in achieving predefined Sustainability Performance Targets. They have typically been used in corporates but they also

b Discussions are ongoing on the extent to which excessive perceived or risk, or factors related to rating methodologies or regulatory measures can result in premia that exceed real risk. Blended Finance aims to reduce cost of capital through financial structuring, not regulatory measures. As such, it is not a regulatory mechanism, while it also should not compensate for regulatory shortcomings. Advancing these issues will be critical to effectively addressing the challenge of high cost of capital for developing countries.

have the potential to raise funds for public investment in adaptation in developing countries.

Despite the potential of SLBs, the market is highly concentrated in developed countries, even though the sustainable financing need of developing countries is far greater. In 2021, issuers from official development assistance (ODA) eligible countries accounted for 13 percent of total issued SLBs, and their share dropped to 5 percent in 2022.[16] In countries that are looking to fund their transition to net zero and attract new investors, SLBs signal the credibility of a sovereign's commitments towards the SDGs and the Paris Agreement, especially since sovereigns are typically the primarily actors responsible for the implementation of these goals.

SLBs are often viewed as an intermediary step in the transition to full-fledged alignment with the SDGs and the Paris Agreement for an issuer that may not have enough projects for a GSS bond tied to assets with green, social, or sustainability objectives. For sovereigns, SLBs are highly relevant for climate change adaptation and social outcomes that have strong financing needs but lack bankable assets and are therefore harder to finance. However, despite the advantages of SLBs for public sector issuers, the SLB market is dominated by corporate issuers, which make up 98 percent of issuances till date.

Public sector issuances of SLBs could allow donors to provide enhanced support to finance adaptation in developing countries. Developing SLBs where the bond funds adaptation projects at the federal or municipal levels could attract domestic funds as well as international flows in hard currency. Donors can ensure that a bond is successfully placed in the market in multiple ways. One key approach is to ensure that the key performance indicators and Sustainability Performance Targets are developed with an adaptation focus as these will determine the coupon payments made by the issuer. Coupon step-ups or step-downs can be used to reward or punish the performance of the issuer; for example, if the issuer does not meet its predetermined sustainability targets by the target observation date, subsequent interest payments will be increased by a predetermined penalty amount (which is usually quoted in basis points).

A recent example of donor support for an SLB issuance can be found in Rwanda. In September 2023, the Development Bank of Rwanda (BRD), which plays a key

role in financing climate-resilient infrastructure in the country, launched its first SLB, with a seven-year tenure and a target size of FRW 30 billion (equivalent to US$24.8 million). The bond was oversubscribed and well received by investors and allowed the BRD to increase and diversify its funding. Issued in local currency, the SLB also reduced risks related to foreign exchange fluctuations. Crucially, the bond benefited from an innovative credit enhancement mechanism from the World Bank International Development Association (IDA) funds. The government of Rwanda used the IDA funds to collateralise the bond, reducing the risk for investors and lowering the cost of borrowing.[17]

As highlighted by this example, although donors support innovative transactions, the SLB market is unlikely to scale to its full potential, especially in developing countries, without coordinated and ambitious interventions. This is why donor engagement is critical at this early stage in the market's development. Donors have limited financing capacity to support bond market developments but their involvement in a transaction can have an important signalling effect. This is critical as new sustainable markets are being developed and clear expectations are being established by donors. In the context of adaptation, there are not many sizeable financing pools outside bonds markets, and SLBs have demonstrated their ability to incentivise and reward performance. Donors need to recognise that SLBs can contribute to addressing the adaptation challenge use the SLB market to address the funding shortfall. A forthcoming OECD report will provide more insights into blockages in the SLB market and the role of donors in addressing them.

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Instruments for Catalysing Private Finance for Adaptation

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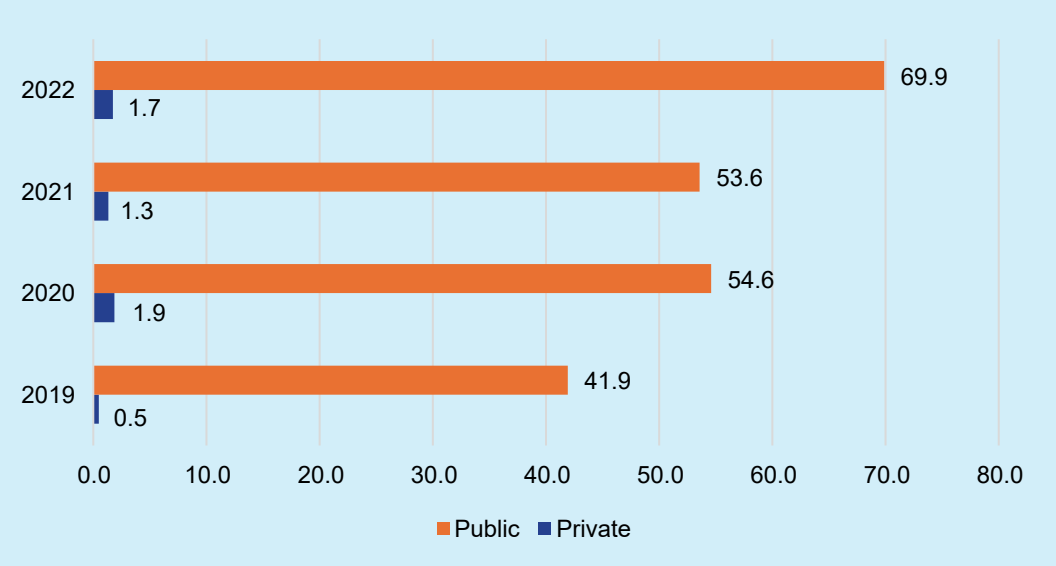
CLIMATE FINANCING IS A GLOBAL CONCERN that has yielded multiple commitments from the international community. The 2009 commitment by developed countries to mobilise US$100 billion annually to support climate action in developing countries was achieved only in 2022, with US$115.9 billion.[1] This reinforces the need to focus on the quality issues as well as the quantum of climate financing being provided. Even with the renewed focus on adaptation, much of the global climate financing remains directed towards the mitigation sector.[2]

As of 2021-22, total annual average global climate finance was estimated at US$1.3 trillion, with renewable energy and transport receiving the maximum influx of funds.[3] The quantum of global adaptation finance reached US$63 billion in 2021-22, recording a 28-percent increase from 2019-20 levels. Despite this rise, the adaptation financing gap is widening, and developing countries will need US$212 billion per annum to meet their adaptation needs till 2030.[4] Additionally, global adaptation finance has been primarily supported by public sources, with the share of private finance remaining negligible (see Figure 1).[5]

Figure 1: Global Adaptation Finance: Private and Public (in US$ Billion)



Source: Authors' own, using data from CPI (2023)[6]

India's total adaptation-relevant domestic expenditure stood at INR 13.35 trillion in 2021-22 or 5.6 percent of the GDP for the period.[7] This assessment was based on the developmental expenditures of several ministries/departments in their budgetary provisions and highlighted the significant share of public sector spending in adaptation in the country.[8]

Barriers to Private Investment in the Adaptation Sector

Diverse barriers impede private sector investments in adaptation. One obstacle is the non-availability of climate risk data and other tools. The private sector has limited capabilities to integrate physical climate risks in their decision-making. The lack of information symmetry and knowledge gaps, coupled with a limited understanding of climate issues and uncertainty regarding investment directions in the climate sector, compound the woes of the private sector. Private investors also face challenges in capturing the environmental and social benefits of their investments.[9] The assessment of potential climate-related impacts and proposed risk management approaches in adaptation studies often has 'blind spots'.[10] Additionally, there is usually a mismatch between the shorter time periods expected by investors and the long-term approach of climate change adaptation planning.[11] Therefore, improving the availability of information on long-term climate change adaptation is essential for enhancing the quality of investments.

The second hurdle to private investment is the absence of institutional arrangements and policies for adaptation. Without concrete policies, allocated budgets, and investment programmes focused on adaptation, private financiers are unlikely to be interested in such investments.[12] Public entities in many developing countries lack the necessary financial and technical expertise for climate-related planning as well as streamlined clearance mechanisms.[13] Clear policy objectives and commitments are crucial for investors, who view government strategies as signs of intent.[14]

The third obstacle stems from the absence of financial incentives, such as tax breaks or concessional finance. Investing in adaptation is perceived as less remunerative due to the high upfront costs and potentially low returns.[15] Therefore, such incentives will be crucial for attracting private-sector investments in the sector, where costs are front-loaded and returns may be spread over several years, which would making the estimation of gains challenging. Incentives like grants, tax breaks, and blended finance can support adaptation projects that may appear to have lower returns. Notably, financial instruments should not be limited to individual projects but should also facilitate broader initiatives like financial sector reform, fiscal policy changes, and innovation.[16] Since financial institutions like commercial banks may be hesitant to fund such projects or champion financial sector reform, it becomes imperative for the government to play a direct role in providing this assistance.

These barriers warrant the need for concerted efforts at the government level to mobilise a steady flow of financing for adaptation activities from the private sector. With the public sector being the major source of climate finance for adaptation, it is vital to maintain an optimum balance between the two to ensure a smooth entry for new private players in the arena.

A World Bank and Global Facility for Disaster Reduction and Recovery (GFDRR) report outlines actions to encourage private-sector involvement in.[17] The first step involves the formulation of an adaptation plan in order to ensure the alignment of private investments. The adaptation plan should also align with the nationally determined contributions (NDCs) of a country. Ideally, the adaptation plan should adopt a sectoral approach, recognising that not all sectors are equally positioned to achieve net-zero. Moreover, a bottom-up approach is preferable, which would ensure that the plan addresses the needs of populations that are directly affected.

Another possible solution is the identification of projects for both the public and private sectors. Private-sector investments often necessitate a reliable revenue stream. This may be challenging in various adaptation projects. In such instances, the revenue stream needs to be substituted by innovative measures and incentives, which can encourage private sector involvement and mitigate their risk in adaptation projects. Examples include the provisioning of grants or concessional loans. Public-private partnerships can also allow the sharing of risks based on strengths and weaknesses.

There is also a need to finalise project particulars and recognise potential private-sector investors. In this case, the government will also need to identify bilateral donors who can provide technical assistance and aid in project structuring. This solution entails assessing potential gaps and ensuring that necessary policies, regulations, and other metrics are established to minimise project risks.

Financing Instruments for Adaptation

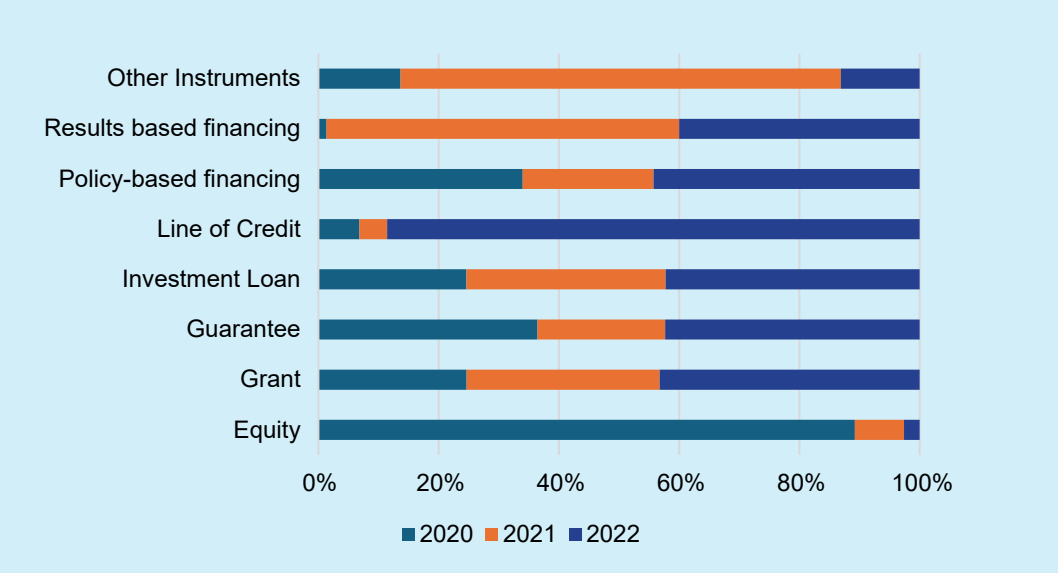
Climate financing employs numerous financing instruments, the most prominent of which are discussed in the following paragraphs.

Multilateral Climate Funds (MCF)

As of February 2023, support pledged to the MCF amounted to US$46.74 billion, of which mitigation accounted for 30.4 percent and adaptation, 11.8 percent; the remaining was directed towards other projects.[18] The top five contributors were the United Kingdom (US$7.6 billion), the United States (US$7 billion), Germany (US$6.3 billion), Japan (US$5 billion), France (US$3.6 billion), and Norway (US$3.5 billion). Out of the total funds disbursed in the adaptation sector, grants amounted to 88.3 percent, followed by concessional loans, equity, and guarantees at 7.5 percent, 3.6 percent, and 0.6 percent, respectively.[19]

In 2022, multilateral development banks (MDBs) committed US$60.9 billion to low- and middle-income countries (LMICs), of which 63 percent was directed towards mitigation and the remaining for adaptation.[20] For adaptation finance, while there has been sustained increase in grant-based financing, financing via the equity route has fallen significantly (see Figure 2). Investment loans have the highest share, at 62-63 percent, and there has been a marked increase in funding provided via lines of credit.[21]

Figure 2: MDB Adaptation Finance and Financing Instrument in LMICs



Source: Authors' own, using data from multiple joint MDB climate finance reports[22,23]

Green Bonds

Green bonds[a] are another promising channel for financing climate change adaptation and leveraging private-sector investments. They have several advantages, such as facilitating access to low-cost capital to issuers for financing their investment pipelines and helping broaden the investor base, given the high demand for green bonds. This is well suited for large-scale adaptation projects that require upfront capital investment and generate modest revenue over an extended investment horizon.[24]

The green bond market has experienced substantial growth, from less than US$40 billion in 2014 to over US$250 billion in 2019.[25] The global value of traded green bonds is projected to reach US$2.36 trillion by 2030.[26] While adaptation projects alone may struggle to attract private capital, the issuance of bonds by reputable organisations increases the likelihood of private capital participation. Encouraging investments in green bonds could also involve utilising public funds to mitigate risk and improve the risk profile of the bond. Public entities can offer de-risking support through credit enhancement instruments, including guarantees, subordinate debt, insurance coverage, and similar measures.

a Green bonds, as defined by the World Bank, are fixed-income and liquid financial instruments designed to generate funds dedicated to projects focused on climate mitigation, adaptation, and other environment-friendly initiatives.

Furthermore, investor interest in thematic 'social' bonds has increased in the post-COVID-19 period.[27] These social bonds derive from the green bonds' "use of proceeds" format to facilitate a medium to realise the potential of capital markets. They have helped fund post-pandemic recovery initiatives as well as deliver social benefits. The volume of issued social bonds globally increased from 2019 levels to reach US$249 billion in 2020.[28] These bonds could be categorised as 'green bonds for climate resilience', propagating the value of investments that cater to the development of resilient economies, ecosystems, and communities. These resilience-related bonds can be utilised to tap the potential of green bonds to enable greater investor engagement in adaptation and resilience.[29]

A subset of green bonds comprises catastrophe bonds, also known as CAT bonds. CAT bonds were initially employed in the 1990s following Hurricane Andrew and the Northridge earthquake in the United States and are a crucial source of re-insurance. In this mechanism, an insurance company establishes a special purpose vehicle (SPV) that issues bonds to investors. CAT bonds offer several advantages such as being 100 percent collateralised, structured to eliminate counterparty risk, and insulated from the prevailing economic conditions.

Green Foreign Direct Investment

Green foreign direct investment, or green FDI, could serve as an additional source for boosting private financial support for adaptation. However, there is yet to be a universal definition of green FDI, with most existing definitions favouring mitigation and being based on investments in the renewable energy, transportation, and environmental technology and services sectors. In the last decade, green FDI has tripled to reach US$252 billion as of 2022, although a significant share of this amount flows to developed countries.[30]

Current green FDI flows underline the potential of this instrument for climate investments, which could include adaptation. However, the private sector demonstrates similar inhibitions regarding venturing into adaptation projects in the case of green FDI as well. Catalysing private-sector investments through this instrument will require support from public funds to de-risk in the form of blended finance structures. Part of the responsibility could rest with development finance institutions (DFIs) and MDBs at the initial stage, which may be extended to include other players.[31]

Debt-for-Climate (DFC) Swaps

In the case of debt-for-climate (DFC) swaps, the debtor nation that has borrowed internationally has the provision to make payments in the form of domestic financing for domestic climate projects under agreed-upon terms. These funds can then be diverted to climate adaptation and resilience projects.

Debt swaps are not novel. Debt-for-nature (DFN) swaps have been utilised in Bolivia, Ecuador, Indonesia, and the Seychelles since the 1980s.[32] Debt swaps can take various forms, including bilateral or tripartite swaps. In the case of the former, previously allocated debt service is redirected to financing projects that have been mutually agreed upon. Tripartite arrangements involve the buy-back of privately held debt, funded by donors and/or new lenders, often facilitated by an international non-government organisation (NGO). Typically, the NGO provides the debtor country with a loan at concessional interest rates, on the condition that the debtor country repurchases the debt at a discount.[33]

Debt swaps have gained significance due to the escalating debt levels in developing countries, which were exacerbated by the COVID-19 pandemic, coupled with a decline in economic activity. Fluctuating exchange rates have added to the complexity of debt servicing.[34] DFC swaps would enable debt stress to be relieved and channel greater funding to adaptation. However, the complex nature of debt swaps has limited their utilisation, and current figures are relatively small, typically within the double-digit million-dollar range.[35]

Global Derivatives Market

The global derivatives market, valued at over US$100 trillion, offers potential for financing climate adaptation.[36] Derivatives are commonly employed as a market-based tool for transferring risk from a party exposed to risk to another party willing and able to bear it. The party creating the contract commits to the investor with respect to a predetermined index. In return, the investor provides an initial payment to the contract writer. Derivatives allow investors with varying risk exposures and perspectives on future climate impacts to engage in transactions.[37]

Conclusion

With the US$100-billion commitment in climate financing remaining unmet, the focus needs to account for both the quantity and quality of financing. While there is a renewed emphasis on adaptation, a substantial portion of global climate financing remains directed to mitigation efforts. Addressing barriers to private investment necessitates improved climate information availability, concrete policies, and financial incentives. The public sector remains a major source of adaptation finance; to achieve a balanced approach, it is vital to facilitate private-sector entry.

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Mobilising Private Finance for Ecosystem-Based Adaptation Through Nature-Based Solutions

Gopalika Arora

THE IMPACTS OF CLIMATE CHANGE are becoming increasingly evident, and societies are facing massive threats from rising temperatures, erratic rainfall patterns, and frequent extreme weather events. Additionally, natural resources are deteriorating at an alarming rate, and human-induced biodiversity loss is escalating.[1] Approximately 40 percent of the planet's land is already degraded, and more than half of the world's Gross Domestic Product (approximately US$44 trillion) is at immediate risk due to nature loss.[2] By 2030, this loss of natural capital could reduce global GDP by 2.3 percent annually (to US$2.7 trillion), with poorer countries bearing the brunt of this decline due to their low adaptive capacity, dependence on climate-sensitive sectors, and already fragile ecosystems.[3] These issues are exacerbated by the impact of changing weather patterns on natural ecosystems.

This necessitates ecosystem-based approaches that can provide cost-effective and sustainable solutions to complement national and subnational adaptation interventions.[4] In this context, nature-based solutions can be used to harness the benefits of nature to

address climate change, biodiversity loss, and land degradation while making headway towards sustainable development.

Recent studies reveal that halting nature loss and investing in nature-positive outcomes can unlock new business opportunities worth up to US$10 trillion annually and generate 395 million jobs by 2030.[5] Despite this potential, integrating nature considerations into corporate decision-making is still at a nascent stage. Therefore, there is an urgent need to unlock finance to arrest and reverse the loss of natural assets and thus accelerate the transition to a net-zero and nature-positive future.

Ecosystem-Based Adaptation: The Rise of Nature-Based Solutions

The IPBES Global Assessment Report,[6] the IPCC AR6 report,[7] and the Global Adaptation Commission Report[8] have highlighted the critical role of natural ecosystems in reducing vulnerability to climate-related extreme events and other economic, social, and environmental shocks and disasters. In this regard, nature-based solutions[a] are being viewed as strategic and cost-effective approaches. These solutions also have the potential to tackle both climate mitigation and adaptation challenges in a cost-effective way while providing additional benefits (amounting to US$170 billion annually) through various ecosystem services.[9]

Losses from climate-induced disasters reached a decade high of US$45 billion in the first quarter of 2024.[10] Nature-based solutions (NbS) like preserving healthy mangrove forests and coral reefs have the potential to reduce these costs while serving as economically viable alternatives that can prevent the damage caused by ecosystem destruction. NbS is estimated to prevent US$57 billion in annual flood damages.[11] Additionally, a cost-benefit analysis of conserving peatlands in Indonesia demonstrated that every dollar invested in conservation yielded a return of US$19 in avoided fire damage.[12] NbS are also being actively integrated into adaptation strategies as they have the potential to reduce socio-economic exposure and sensitivity and support

a Nature-based solutions are defined as “actions to protect, sustainably manage, and restore natural and modified ecosystems that address societal challenges effectively and adaptively, simultaneously benefiting people and nature.” The concept is rooted in finding innovative and economically viable solutions to manage natural resources in a way that balances the benefits to both nature and society. See: https://iucn.org/sites/default/files/2022-11/nbs-in-gbf-targets-brief-november-2022.pdf

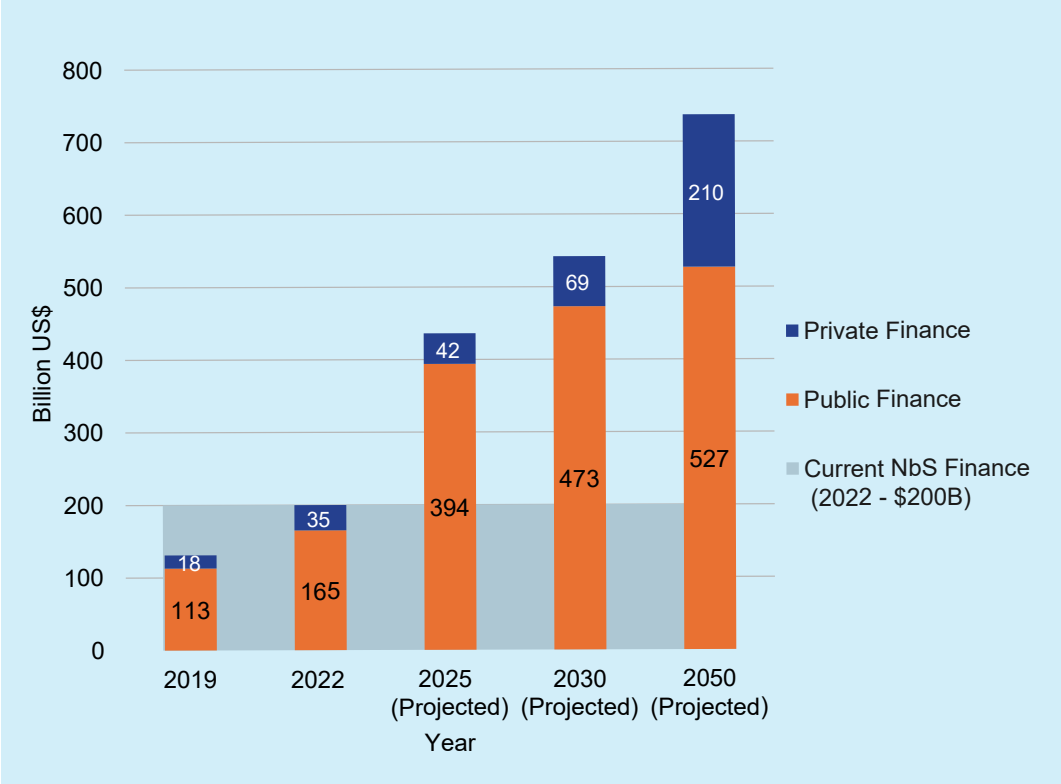
adaptive capacity.[13] Other than their crucial contributions to climate-change mitigation and adaptation, well-designed and well-implemented NbS can provide a range of co-benefits, such as economic development, ecosystem protection, land restoration, and food and water security.[14]

Persisting Funding Gaps

To be sure, there is increasing international recognition and commitments through initiatives like the Sendai Framework,[15] the Convention on Biological Diversity,[16] the United Nations Convention to Combat Desertification (UNCCD),[17] the Bonn Challenge,[18] and the Paris Agreement under the United Nations Framework Convention on Climate Change.[19] Investments in NbS, however, remain insufficient. According to the 2023 State of Nature Finance Report, annual financial flows to NbS in 2022 amounted to approximately US$200 billion, which represents only a third of the funding required by 2030 to meet climate, biodiversity, and land degradation targets.[20]

The public sector dominated this investment, contributing 82 percent (US$165 billion), mostly for biodiversity and landscape protection. For their part, the private sector contributed a disproportionately low share, at 17 percent (US$35 billion), with a focus on sustainable supply chains, biodiversity offsets, and payments for ecosystem services. Although private investments in NbS have nearly doubled from the 2019 levels (US$18 billion), there is a vast gap that needs to be filled to achieve the Rio-aligned goals by 2030 and 2050[21] (see Figure 1). This underscores the need for robust strategies to mobilise private finance for NbS on a larger scale.

Figure 1: Public and Private Finance Flows to NbS, Current and Projected



Source: Author's own, using data from SFN (2021)[22] and SFN (2023)[23]

Factors Limiting Private-Sector Investment in NbS

Private-sector investments in sustainable interventions including NbS remain limited. Despite NbS having been defined by the IUCN for over a decade and gaining traction following the Paris Agreement and the Convention on Biological Diversity, its understanding and adoption among investors and stakeholders remains low. These challenges are exacerbated because of the public-good nature of NbS, which provides benefits and co-benefits that cannot be restricted to specific users.[24] Another challenge is the high upfront capital investment required in the initial stages of NbS projects.

The success of these projects also relies on the commitment and coordinated efforts of all stakeholders, including project developers and local communities. Additionally, NbS investments often clash with investor preferences for immediate returns and shorter gestation periods. The uncertainties and high risks associated with NbS projects, coupled with a lack of evidence for their economic, environmental, and social returns,

further deters investment.[25] Unlike sectors such as agriculture, which have well-defined revenue streams, projects like mangrove restoration may not generate traditional income,[26] though they can yield multiple benefits and positive externalities such as landslide prevention and reduced flood risks, which are often overlooked in economic assessments.[27] Quantifying the outcomes of NbS requires complex methodologies, sophisticated techniques, and resources, which further contributes to the high costs and perceived risks associated with NbS investments.

While advancements have been made in assessing climate risks, evaluating nature risks is more complex due to local factors. Additionally, there is a lack of transparent and publicly available data on the impacts and benefits of NbS at national and sub-national levels, which are critical for informed project development, investment strategies, and policy formulation.[28] This issue is exacerbated by the absence of universal definitions, metrics, and widely accepted risk and reporting frameworks for NbS investments. The lack of standardisation complicates the evaluation of project outcomes, creating inconsistencies across the market.[29] Consequently, investors struggle to identify sectors in which impact can be effectively measured. The information gaps and lack of standardisation also make the sector vulnerable to greenwashing, undermining trust and slowing the progress of NbS projects.

Despite efforts to accelerate project development, there is no comprehensive pipeline of NbS projects categorised by sector. These projects are often localised, making them difficult to replicate and scale.[30] The current volume of NbS projects is insufficient to meet the demand, and existing initiatives often require additional development and aggregation for scalability.[31] Additionally, the lack of skills and expertise within the project-development community, the financial sector, and other relevant stakeholders hinder the scaling up of NbS to attract investment.

Another hurdle to private investment is the absence of institutional arrangements and policies for NbS. Without concrete policies and programmes focused on NbS, private financiers are unlikely to invest. There is also the lack of an integrated approach to govern these solutions. NbS often include a range of activities across landscapes and jurisdictional boundaries. Effective NbS governance requires coordination and collaboration among different stakeholders across sectors.[32] For instance, implementing nature-based approaches for effective storm-water drainage across watersheds necessitates collaborative decision-making involving various levels of governance and multiple ministries.[33]

Recommendations

Despite their ecological and socio-economic potential, NbS continues to receive critically low funding from the private sector. This issue is driven by the high perceived risks and information asymmetry. The following paragraphs discuss potential avenues for mobilising private sector finance for NbS.

Promoting Accessible Data-Sharing, Standardised Metrics, and Innovative Tools

There is a need to establish universal definitions, specific metrics, robust data-collection methodologies, and transparent disclosure tools to effectively measure the impacts of NbS projects. While certain carbon-specific metrics and standards exist, a comprehensive methodology to compare NbS projects and impacts, especially those related to biodiversity, is lacking. The language of policy, standards, and metrices also needs to be harmonised across jurisdictions and geographies to ensure a system-wide alignment and to eschew any greenwashing concerns.

Improving data availability, accessibility, and quality is also crucial. Current NbS data sources are fragmented and inconsistent across platforms. Initiatives such as the 'Guidelines for Nature-Based Solutions Data' by Nature4Climate and the OpenEarth Foundation[34] are steps in the right direction; however, comprehensive data and information management systems are required for transparent reporting and regular updating of data. A dedicated common platform for data dissemination would be beneficial. Coordinated and collaborative efforts among different stakeholders like government agencies, research institutions, and the private sector are essential to ensure the development and implementation of effective data standards for NbS.

Establishing robust disclosure and reporting frameworks is another crucial requirement to attract investments towards Nbs. Initiatives like the Taskforce for Nature-related Financial Disclosures (TNFD)[35] and the Science-Based Targets Network (SBTN)[36] help investors understand the environmental impact of their investments and set nature- and climate-related targets. However, these initiatives currently do not assure the quality of NbS projects. Investors must engage and build on these taskforces and networks to create international standards and common metrics appropriate for NbS markets.

Innovative Financial Instruments and Mechanisms

Nature finance represents a small fraction of the sustainable finance market, presenting a significant missed opportunity. Bridging the financing gap for NbS in developing economies will require looking beyond traditional funding sources. An array of innovative financial instruments and mechanisms has emerged to fund the conservation of natural capital, from debt-based instruments and grants to risk management mechanisms.

Debt-based mechanisms like Sustainability-Linked Bonds (SLBs) are gaining traction as effective instruments to finance NbS. Unlike other thematic bonds such as green and blue bonds, SLBs are forward-looking performance-based instruments that are based on achieving certain predetermined environmental indicators, rather than being tied to a specific project. This offers greater flexibility in using the proceeds compared to other bonds that are restricted to funding specific "green projects";[37] a notable example is Uruguay's 2022 SLB issuance linked to its Nationally Determined Contributions (NDCs) goals for GHG emissions, and native forest maintenance.[38] However, as of July 2023, SLBs still represented a small portion of the sustainable debt market, making up only 4 percent of issuances.[39]

Another emerging instrument for mobilising private finance for NbS is debt-for-nature swaps. These swaps allow countries to convert their debt into investments in nature conservation and other social interventions and development projects. Since the first swap in 1987 between Bolivia and Conservation International, over 30 countries have implemented similar swaps, restructuring US$2.5 billion in debt and releasing US$1.2 billion for conservation projects.[40] Historically, these transactions have been relatively modest in size and total volume; however, recent swaps in Belize and Ecuador indicate a trend towards larger-scale transactions.[41]

Innovative financing mechanisms such as blended finance are essential to address the perception of NbS as being high-risk. Blended finance has already proven to be effective in leveraging development finance to attract additional investment for sustainable development in emerging economies. It can similarly enhance the bankability of NbS projects by strategically deploying public capital as technical assistance, guarantees, or as first-loss capital, thereby reducing perceived risks for private investors.[42] Blended finance funds can also aggregate smaller NbS projects into a larger portfolio, thereby diversifying risk and enabling larger-scale investments.

Well-Functioning Carbon Markets

Carbon is a crucial source of income for NbS projects.[43] The global carbon market currently covers almost one-fifth of global emissions and is valued at nearly US$850 billion annually as of 2023.[44] Despite this, there has been minimal investment in NbS sectors.[45] Voluntary Carbon Markets (VCM), valued at nearly US$2 billion, can play a significant role in mitigating this phenomenon.[46] VCM certify credits from forestry, agriculture, and wetlands, with forestry activities providing most NbS credits. The introduction of nature and biodiversity credits into the VCM has further increased interest in financing NbS. However, these markets remain underdeveloped. Blue economy credits are still at a nascent stage, limited to mangrove conservation and restoration projects. Carbon markets are fragmented across different jurisdictions and sectors, reducing transparency, increasing transaction costs, and decreasing market efficiency.[47] Therefore, industry-wide efforts to enhance carbon market functionality are essential to make NbS a viable asset class.

Training and Capacity Building

NbS is a relatively novel concept. Despite recent efforts to integrate natural capital considerations into private-sector investment portfolios, financial institutions and the private sector often lack the necessary skills and tools to accurately assess the risks and returns of NbS projects and to structure investments effectively. Training and knowledge resources are limited, necessitating capacity building in identifying nature-related interventions, improving reporting and disclosure, supporting NbS-related innovative financial instruments and formulating related policies. The private sector needs to enhance its internal capacity to establish relevant frameworks to bridge existing knowledge gaps. Fostering transdisciplinary, bottom-up processes and maintaining continuous, creative dialogue among key stakeholders and communities is crucial. This approach can further lead to collaborative knowledge creation, innovative solutions, and the sharing of best practices. Establishing a common platform that contains a repository of NbS projects and other related data for diverse stakeholders would facilitate funding, raise awareness, and promote wider adoption of NbS. This platform could also feature successful case studies, types of financial instruments available, and the role of blended finance in NbS transactions.

Conclusion

The international policy discourse is increasingly recognising NbS as cost-effective measures for addressing a multitude of environmental and social issues, including disaster risk reduction, climate change mitigation and adaptation, food and water security, and biodiversity protection. These solutions present a growing array of investment opportunities. However, private finance flows into NbS initiatives remain inadequate due to market and information failures. Challenges in measuring the effectiveness of NbS contribute to high uncertainty regarding their cost effectiveness compared to alternatives. The key outcomes from implementing the recommendations in this chapter include a focused NbS project pipeline, a strong business case and understanding of the business viability of these projects, and closing the knowledge gap to unlock large-scale financing.

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MDBs in Financing Adaptation: New Approaches to Assess the Effectiveness of Adaptation Interventions

Adele Tanguy, Alexandre Magnan, and Lola Vallejo

THE NEEDS OF DEVELOPING COUNTRIES for adaptation finance are up to 18 times higher than current flows of public finance from developed countries.[1] The costs of adaptation for developing countries in this decade are estimated to be around US$215 billion per year. The absolute costs are higher for upper and lower middle-income countries, East Asia and the Pacific, and Latin America and the Caribbean. However, in terms of the proportion of gross domestic product (GDP), low-income countries have the highest estimated costs (at 3.09 percent of GDP), as do least developed countries (2.67 percent), and small island developing states (3.39 percent).

To close this gap, developed countries have committed to provide adaptation finance to developing countries through the 1992 United Nations Framework Convention on Climate Change and the Paris Agreement (Article 9 paragraph 1), further reiterated through the Glasgow Climate Pact of 2021, which "urges developed country Parties to at least double their collective provision of climate finance for adaptation to developing country Parties from 2019

levels by 2025."[2] Despite this, international public finance for adaptation to developing countries has decreased since 2020.[3] Multilateral Development Banks (MDBs) channel public finance for adaptation, as acknowledged in the 2023 first Global Stocktake (GST) decision, which "call[s] on multilateral development banks and other financial institutions to further scale up investments in climate action."[4]

Barriers to adaptation have led to MDBs being hesitant to finance adaptation projects. These barriers include low returns on investments, lack of knowledge and common definitions of adaptation and what makes it efficient, and its links with development and disaster risk reduction.[5] MDBs have taken steps towards integrating adaptation financing in their activities; since 2018, nine MDBs as well as the International Development Finance Club (IDFC) have committed to align with the Paris Agreement through a joint declaration based on six building blocks, of which Building Block 2 requires MDBs to contribute to adaptation by enhancing the resilience of their investments and Building Block 5 relates to the reporting on climate finance and the harmonisation of approaches among MDBs.[6]

An annual Joint Report on Multilateral Development Banks' Climate Finance tracks adaptation finance activities in MDBs with a view to reduce double counting.[7] The report, however, focuses on mapping flows while neglecting to question their effectiveness in reducing climate risks and supporting adaptation.[8] Effectiveness is generally overlooked in discussions around the adaptation finance gap. This essay addresses this issue by asking the following questions: What are MDBs' current approaches and challenges to measure the climate effectiveness of the adaptation finance they provide? To what extent can innovative assessment methods help respond to these challenges?

Assessing Adaptation Outcomes Beyond Tracking Flows

The quantity of climate finance flows and the associated adaptation gap in vulnerable and developing countries is part of the issue. The first GST demonstrated a lack of collective progress towards achieving the Paris Agreement goals and highlighted difficulties in tracking the progress on the Global Goal on Adaptation (GGA), with discussions around measuring such progress being heavily debated.[9] Negotiations for the "new collective quantified goal", which is set to be adopted at COP29, are centred around better defining a needs-based target,[10] along with potential sub-goals

that can be linked to the GGA to consolidate a clearer climate finance strategy and move beyond the US$100-billion goal set in Copenhagen in 2009.[11]

The quality of finance is also an important factor. It includes the types of financial instruments used for funding adaptation (i.e., grants instead of loans, no debt burdening, increased adaptation, and providing little returns on investment). The funding outcomes on the ground are also vital. A consequent reform agenda of the financial architecture has led to the adoption of a number of initiatives in the last year (e.g., Summit for a New Financial Pact,[12] World Bank Roadmap,[13] Bridgetown Agenda, Accra-Marrakech Agenda[14]). Donors, MDBs, and recipients are making efforts to survey ways to assess whether existing financing is resulting in greater adaptation on the ground and increased resilience for climate-vulnerable communities.[15] To date, however, there is a lack of tracking outcomes (and not just outputs), especially for the long-term benefits of projects, such as outcomes that address root drivers of vulnerability. Monitoring and evaluation methodologies and frameworks are also fragmented.[16]

These circumstances raise some critical questions: how are adaptation actions assessed and over which time period? Additionally, how are the outcomes on climate risk drivers evaluated? These questions attempt to understand whether interventions and financial support prioritise effective risk reduction and minimise the risk of maladaptation. The cost of an intervention does not necessarily reflect the adaptation benefits of the intervention.

In addition, the benefits of an adaptation project could be realised beyond the project timeline and available funding. For example, planting mangroves, restoring ecosystem services, and cascading benefits towards livelihoods and well-being may take over five years, whereas project lifecycles are often carried out within three years. Further, adaptation benefits may be qualitative and therefore harder to include in indices;[17] these benefits include livelihood securing and diversification, increased access to resources, community empowerment, governance strengthening, and enhanced well-being. The intersectional nature of adaptation outcomes[18] adds to the assessment challenge, as benefits may vary depending on factors such as age, gender, identity, and cultural context.

This raises the question of what effectiveness means and the desirable outcomes of effectiveness. It also raises the question of whether process-based and outcome-based approaches should be systematically combined. This last question reflects a difference between two approaches of effectiveness in the development sphere: a deontological approach, which considers "aid as a principle" evaluated on the basis of the quantity of finance provided and the fairness of allocation, and a consequentialist approach, which considers the efficiency for creating results and long-term impact.[19]

Despite the differences, metrics are required to provide guidance at the project level, monitor and track progress at the portfolio level, and possibly undertake analyses across multiple funding sources, including MDBs. Till date, however, there is no universally accepted impact/outcome adaptation metric system, which results in various funding bodies using different metrics.

MDBs' Current Approaches to Effectiveness

MDBs usually assess the effectiveness of their interventions at both the project and portfolio levels. At the project level, MDBs have developed tools for the screening and assessment of climate change vulnerability, in line with the MDBs' joint methodology for tracking climate change adaptation finance,[20] to ensure that interventions are resilient to current and future climate risks. However, the lack of common guidelines on whether adaptation/resilience has increased (or climate risk decreased) due to a project has led to some MDBs developing their own methods. While this hampers the availability of cross-MDB insights on the outcomes of MDB-driven adaptation finance, some initiatives by MDBs provide useful insights towards defining common assessment principles (see Table 1).

Table 1: Aspects of Climate Resilience Measured by MDBs

Type of Indicator	Indicator Captures	Metric Example	Reference
Quality of project design metrics at the project level	Physical climate risks in projects	Budget committed to resilience measures (**input**) Early warning system implemented and operational (**output**) Road section built with climate resilience measures (**output**) Road and transport service along corridor linking two capitals resilient to climate change (**outcome**)	African Development Bank Climate Safeguards System
Quality of project design and results at the project level	How effectively the project aligns with predefined climate change mainstreaming objectives	Bronze rating (B) for the Smallholder Agricultural Productivity Enhancement Program for Sub-Saharan Africa	Islamic Development Bank's Simplified Verification Tool
Quality of project design metrics at the project (asset or system) level	The quality of the inclusion of climate-related risks in the economic and financial assessment and the disclosure of risk reduction measures implemented (as relevant)	Project score of A+	World Bank Group RRS

Type of Indicator	Indicator Captures	Metric Example	Reference
Input metric at the project or portfolio level	Volume and distribution of the costs of addressing climate change vulnerabilities	Volume in adaptation financing in an MDB education project	MDB/IDFC Adaptation Finance Tracking
Output metric at the project level	Outputs that directly contribute to climate resilience	Length of improved drains constructed Number of cyclone shelters constructed with separate and safe facilities for women	Asian Development Bank's Coastal Towns Environmental Infrastructure Project
Output metric at the project and portfolio level	Residual physical climate risk of each investment loan and the overall cumulative residual climate risk in the EIB investment loan portfolio	Residual climate risk of project's financed underground power transmission lines	EIB Climate Risk Assessment System (2019)
Output and outcome metrics at the project level	Climate resilience outcome generated by project activities	Rain gauge stations installed and in operation in the project area (**output**) Days per year with severe traffic restriction due to landslides in road sections (**outcome**)	Inter-American Development Bank Disaster and Climate Change Risk Assessment Methodology
Output and outcome metrics at the project level	Climate resilience outcome generated by project activities: water savings in arid zones	Volume of annual water savings **(physical outcome)** Climate resilience benefit per year **(valorised outcome)**	AfDB Climate Safeguards System

Type of Indicator	Indicator Captures	Metric Example	Reference
Outcome metrics at the project level	Climate resilience outcome generated by project activities	Estimated days per year of avoided weather-related disruption to relevant road section and increased road lifespan compared to pre-project baseline **(physical outcomes)** Combined economic value of savings per year **(valorised outcome)**	EBRD Climate Resilience Outcome Approach, Green Economy Transition (2018)

Source: Adapted from IDB[21]

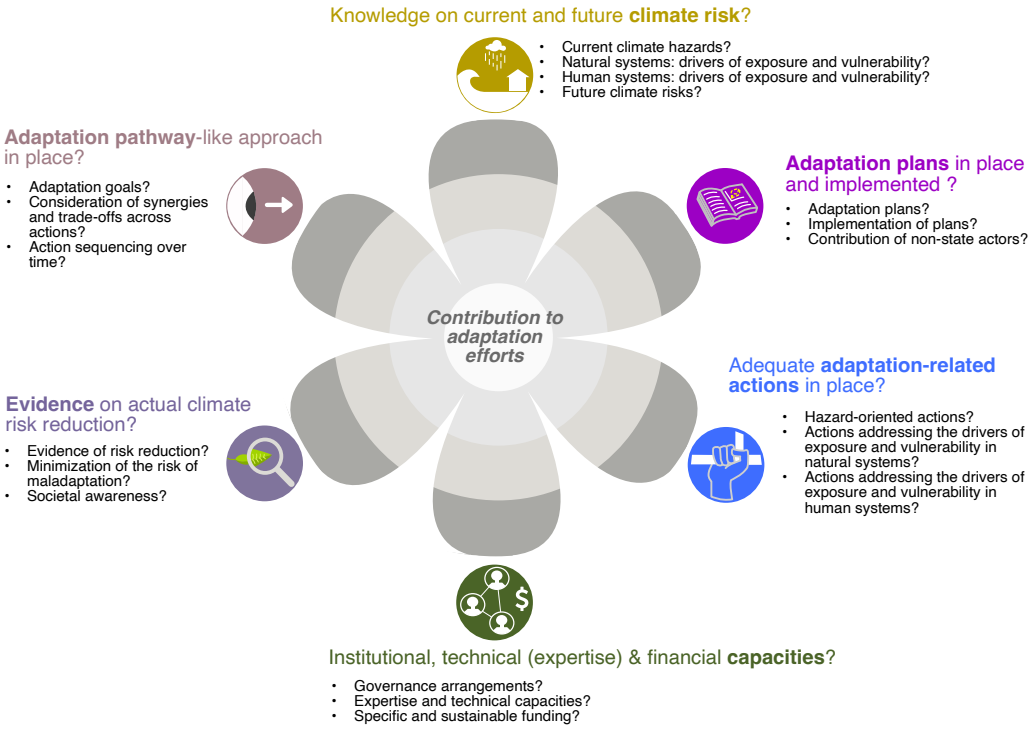
Table 1 suggests that MDBs' approaches to assess adaptation outcomes either rely on quantitative metrics, which can be hard to monitor and provide a narrow vision of outcomes (restricted to indicators for which data already exists), or less frequently on qualitative rating systems such as the Resilience Rating System (RRS) developed by the World Bank, which focus on project design metrics. Both approaches would benefit from delving further into adaptation impact and outcomes.

The fragmentation of MDBs' approaches to climate finance reporting beyond tracking flows could partly be attributed to the complexity of monitoring and evaluating adaptation effectiveness towards achieving long-term goals.[22] Measuring adaptation through single metrics can be challenging due to the context-specificity of adaptation effectiveness and adequacy, which makes it difficult to develop universal climate resilience indicators that could be applicable across projects, scales, and contexts.[23] Although projects are time-bound and relatively isolated from broader implementation challenges, accounting for the long-term outcomes and impacts of investments towards increased resilience and adaptive capacity or reduced risks, especially in the context of uncertain climate-change scenarios, can be difficult. However, there is space for greater harmonised practices among MDBs.

Innovative Approaches to Assess Adaptation Outcomes: GAP-Track

A combination of quantitative and qualitative information is required to overcome the methodological barriers to assess the outcomes and impact of MDBs' finance and support for adaptation. Recent experiments have highlighted that there is potential for building on innovative methodologies. For instance, the Global Adaptation Progress Tracker (GAP-Track) incorporates qualitative information and structured expert judgement methods to respond to six overarching questions about the physical and human dimensions of adaptation (knowledge, planning, actions, capacities, evidence, and forecasting[24]), which are further divided into 19 sub-questions (see Figure 1). For specific case studies (e.g., local coastal areas[25]), each sub-question is answered on a 0-4 scoring system (with each score being described for each question) by using expert judgement methods supported by textual justifications and levels of confidence that reflect the amount of evidence.

Figure 1: The GAP-Track Approach



Source: Magnan et al.[26]

The GAP-Track approach could benefit MDBs in assessing the effectiveness of their investments from an outcome perspective. Its six overarching questions, address a broad range of adaptation dimensions, which supports increased comprehensiveness in the assessment of adaptation benefits depending on the type of interventions considered. Table 2 highlights the relationship between the type of activities that MDBs consider to be adaptation-related and the GAP-Track categories. It also offers great flexibility: indeed, the framework does not have to be applied in a blind way but can be refined and adapted to the needs of MDBs for assessing the adaptation outcomes of their interventions. As a result, it is also a tool that can be adjusted over time and depending on the contexts of intervention. Moreover, the multi-scale and multi-system approach can bring consistency across interventions operating at various scales and across various territories therefore allowing for both aggregation of results and context-specificity.

Table 2: Relevance of GAP-Track Questions for Different Types of MDB Adaptation Interventions

Aspects of MDBs' Contribution to Adaptation	Resilience of Investments	Resilience through Investments	
	Type of activities (adapted from the Joint Methodology for Tracking Climate Change Adaptation Finance[27])		
	Activities that integrate measures to manage physical climate risks and ensure that the project's intended objectives are realised despite these risks	Activities that directly reduce physical climate risk and build the adaptive capacity of the system within which the activity takes place	Activities that contribute to reducing the underlying causes of vulnerability to climate change at the systemic level and/or removing knowledge, capacity, technological, and other barriers to adaptation
GAP-Track Adaptation Dimensions			
Knowledge on current and future risks	✓✓	✓✓	✓✓
Adaptation plans in place and implemented	✓	✓	✓✓

Aspects of MDBs' Contribution to Adaptation	Resilience of Investments	Resilience through Investments	
Adequate adaptation-related options in place	✓✓	✓✓	✓✓
Institutional, technical (expertise), and financial capacities in place	✓	✓✓	✓✓
Evidence of actual climate risk reduction	✓	✓✓	✓✓
Adaptation-pathway like approach in place		✓	✓

Note: One tick represents potential relevance depending on the context, and two ticks represent a fully relevant area.

Source: Authors' own.

The GAP-Track method relies on the triangulation of information and can ensure inclusivity in the assessment of adaptation outcomes by enabling input from a broader set of stakeholders, including beneficiaries of interventions, and by including a wide range of information. Therefore, it is important to ensure that finance flows are targeted towards processes and results that increase adaptive capacity (e.g., through the six dimensions of the GAP-Track) and correspond to beneficiaries' vision and needs. This requires the participation of developing countries in the framing of adaptation results and outcomes—such as the six dimensions of the GAP-Track. The method lays the foundation for monitoring outcomes over time, at the project level as well as at portfolio level, through the aggregation of project-specific results. Regular assessments can offer the opportunity to track the progress of adaptation objectives in uncertain climate futures to address whether financial support contributes effectively to climate risk reduction.

Conclusion

The Glasgow pledge aims to double adaptation finance by 2025. Climate finance negotiations this year, particularly on the new collective quantified goal for 2030, will be key to closing the adaptation finance gap and better define needs, determine the

role of private and public actors, and break down barriers of accessibility. Current trends demonstrate that an increase in international finance for adaptation is unlikely to achieve the required scale, especially in developing countries. Therefore, it is essential to ensure that the impact of the mobilised finance is maximised and that adequacy and effectiveness are treated as two sides of the same coin. Further, there is need for a qualitative prism to be added to the current methodologies of MDBs for assessing adaptation projects, outcomes, and impacts to allow for their aggregation, similar to tracking of flows. Methods such as the GAP-Track could help arrive at an agreement on outcome/impact metrics to track the effectiveness of adaptation finance by MDBs. These metrics can then be used to complement other existing approaches, such as reporting towards result frameworks and developing quantitative indicators for adaptation. Using approaches inspired by structured expert judgement methods will allow for greater inclusiveness, context-specificity, and flexibility, which are essential to assess adaptation across scales and across contexts. This would also allow tracking the extent of MDBs' contribution to real adaptation outcomes on the ground to inform the targeting and design of adaptation interventions.

Thus, innovative methods such as the GAP-Track can enable a more comprehensive understanding of effectiveness by integrating qualitative factors. Such methods can feed into policy processes around adaptation such as the GGA, such as by incorporating the two-year work programme on indicators that emerged from the first GST at COP28, therefore enhancing clarity on the adaptation goals of the Paris Agreement.

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Tools for Tomorrow: Financing Climate Adaptation and Resilience

Tom Kerr and Daphne Basangwa

RISING GREENHOUSE GAS (GHG) emissions are causing more frequent and extreme weather events, such as floods, heat, droughts, and wildfires,[1] which hinders countries' ability to protect their development gains and achieve improvements in living standards.[2] As global temperatures rise, more frequent and severe high-temperature and precipitation events are expected, which underscores the need for urgent action.

While the Paris Agreement has spurred global action on climate change and reduced future warming forecasts, current national commitments fall short of the levels required to limit warming to 1.5°C above pre-industrial levels by 2030.[3] Therefore, action to simultaneously reduce GHG emissions and enhance adaptation and resilience is imperative. While there has been some progress in scaling up finance for climate change mitigation—notably for renewable energy, energy efficiency, and e-mobility[4]—the US$63 billion annual flows in adaptation financing fall short of the estimated US$212 billion per year required by developing countries alone till 2030.[5]

Most adaptation and resilience projects have unfavourable risk-return profiles. They are also longer-term investments with benefits that are difficult to quantify and monetise. As a result, projects are largely funded by public actors. This is especially true in emerging regions, where government budgets are constrained due to growing debt burdens. While governments and private companies worldwide have expressed their commitments to increasing resilience, deployment remains slow, hindering progress in building resilience and adapting to the changing climate.

The World Bank[a,6] has provided a whole-of-economy framework for countries seeking to advance adaptation. The framework has six pillars of action for strengthening adaptive capacity, reducing vulnerability, and building resilience, first of which is to aim for rapid, robust, and inclusive development. The other pillars are the following:

- **Facilitate the adaptation of firms and people** through measures such as making disaster/climate risk assessments publicly available; clarifying responsibilities and aligning incentives; facilitating access to technologies; making financing available; and facilitating structural change from sectors that are losing their competitiveness to emerging growth sectors.

- **Adapt land use and protect critical public assets and services** by identifying critical sectors and assets vulnerable to climate impacts; implementing a government-wide strategy to increase resilience of infrastructure and public assets; and revising land use and urban plans to make them risk-informed.

- **Help firms and people cope with and recover from disasters and shocks** by establishing life-saving hydromet, early warning, and emergency management systems; providing risk management instruments to households and firms; developing the insurance sector, including through public-private partnerships; building a shock-resistant social protection system; helping firms develop business continuity plans with financial preparedness; and providing contingency plans for disasters.

- **Anticipate and manage macroeconomic and fiscal risks** through the inclusion of contingent liabilities from natural disasters and climate shocks in the budgeting

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process; developing a multipronged financial strategy to manage contingent liabilities; anticipating long-term macroeconomic impacts; and communicating and mitigating the disaster and climate risk exposure of the financial sector and pension systems.

- **Prioritise, implement, and monitor interventions** by creating a strong institutional and legal framework with appropriate stakeholder involvement; developing an adaptation/resilience strategy with prioritised actions; setting up sector targets to guide implementation by line ministries; screening public policies for climate risks and aligning policies with resilience aims; allocating budgets for adaptation; and tracking/reviewing progress over time to adapt the strategy as needed.

Most of the funding for adaptation is required for sectoral interventions, such as building more resilient roads, investments in irrigation, and financial protection instruments. To fund such interventions, governments can create dedicated funds from various sources, including state budgets and foreign aid. For example, Bangladesh's Climate Change Trust Act 2010 created a Climate Change Trust Fund as the designated mechanism to fund actions to address the adverse impacts of climate change.[7] Tuvalu's Climate Change and Disaster Survival Fund Act 2015 created a fund to provide vital services to reduce climate change and natural disaster risks.[8] Guatemala's 2013 Climate Change Framework Law created the National Fund for Climate Change to support natural risk management plans, programs, and projects for climate change adaptation, mitigation, capacity building, and payment for ecosystem services for carbon sinks.[9]

Integrating adaptation and resilience funding into sectoral budgets may be more preferable than creating dedicated budgets. For example, funding resilience in the transport system by utilising the transport infrastructure budget would ensure that investments in the transport system and its resilience are consistent and aligned. An example of an integrated approach is the Resilient Kerala project supported by the World Bank and several development institutions.[10] The 2018 flood in Kerala affected almost 5.4 million people (about 16 percent of the population), with total recovery needs amounting to US$4.4 billion. The government recognised that a traditional approach to recovery and reconstruction may not ensure comprehensive preparedness for future disasters and that there was a need to ensure better standards of living for all sections of society.

The Resilient Kerala project aims to enhance the state's resilience through holistic river basin management, sustainable and climate-resilient agriculture, risk-informed land-use and disaster management planning at the local levels, and the creation of a dedicated institutional modality.[11] The Rebuild Kerala Initiative will oversee the rollout of the Rebuild Kerala Development Programme.[12] Ongoing support will mainstream sector resilience, including urban services and solid waste, agriculture, transport, and health.

Financial risk management instruments for financing resilience have been successfully tested. Climate and disaster risk insurance is a proven instrument to mobilise private capital and protect households, firms, banks, and governments from climate-related and other natural hazards. Sovereign disaster risk financing—which includes the mobilisation, allocation, and disbursement of funds following disasters—helps increase the financial response capacity of governments and their access to effective funding for rapid response and reconstruction. It draws in private capital to meet financing needs by transferring risk to international financial markets, such as through catastrophe (CAT) bonds, catastrophe swaps, or reinsurance. Contingent credit, such as the World Bank's CAT DDO (Catastrophe Deferred Drawdown Option), is helping governments secure funds before a disaster and can finance emergency response to disasters. It has also been successful in supporting a dialogue on broader issues of disaster risk management and engaging ministries of finance in this agenda.

Even cost-effective investments in adaptation and resilience can be difficult to fund and finance. Many countries with high vulnerability to natural hazards and climate change already have steep debt levels that make it challenging to finance investments—for resilience or any other purpose. Constraints on investment capacity also tend to make countries more vulnerable, increasing their debt level every time a disaster forces them to invest heavily in reconstruction. The International Monetary Fund has proposed that vulnerable countries develop comprehensive disaster resilience prioritisation strategies in consultation with development partners and other stakeholders to facilitate donor coordination and make it easier to decide on the value of various investments in high-risk and high-vulnerability contexts.[13]

Further, not all benefits from adaptation and resilience investments can be readily transformed into a financial flow that can be used to reimburse loans. Benefits tend to be far in the future—sometimes beyond the borrowing time horizon. Transforming

avoided losses into actual cash flow is also a complicated process. Unlike monetary benefits (such as from a road toll), it is difficult to monetise avoided losses or gains in well-being from better health or quality of life and transform them into finance that can be used to support upfront costs. In such cases, financing adaptation and resilience investments needs to rely on general taxation rather than the direct benefit of each investment.[14]

While domestic funds are critical to close the funding gap, international finance continues to be vital in developing regions, given the current disparity in fund accessibility and concentration. Historically, international funds have served as the primary source of concessional and grant funds for development and climate action. Multilateral and bilateral development banks also play an important role, particularly in building capacity and integrating development initiatives with climate action. International financial institutions can provide concessionary and grant funds by partnering with other organisations.

An important outcome of COP28 in Dubai in late 2023 was the agreement on the operationalisation of a loss and damage fund at the World Bank for an interim period of four years.[15] The purpose of the fund is to assist particularly vulnerable developing countries in responding to economic and non-economic loss and damage associated with the adverse effects of climate change, including extreme-weather and slow-onset events. As a new channel for multilateral finance, the fund seeks to provide new, additional, predictable, and adequate financial resources for such countries and assist in mobilising external finance to address loss and damage, while supporting sustainable development and the eradication of poverty. The fund—which has over US$661 million in initial commitments—is expected to be operationalised in the following months, with final approvals to be made at COP29 in late 2024.[16]

Public international finance interventions for adaptation can unlock private finance through a variety of blended finance instruments, including debt, equity, credit enhancement, and grants. Developing country governments can issue adaptation bonds. In 2019, the European Bank for Reconstruction and Development (EBRD) issued a climate resilience bond and raised over US$700 million with demand from 40 investors across various countries.[17] The proceeds were used to finance climate-resilient projects within the EBRD's Climate Resilience Portfolio.

Adaptation and resilience co-benefits can be used as an incentive to mainstream adaptation elements into other projects such as those on clean energy. Incorporating resilience elements into infrastructure projects can enhance their bankability and attract private investors. Another alternative could be to make existing infrastructure resilient, such as by using heat-proof concrete to refurbish a motor route. The CI2 fund, for example, provides financial resources for communities to reduce the risks and harm from climate change impacts.[18] This fund finances actions such as building stronger housing, developing more drought-tolerant crops, establishing social safety nets, and improving decision-making around climate-related risks. It also has a mandate to mobilise private finance and harnesses spillover effects through its explicit focus on both adaptation and mitigation.

There is also a potential to scale up results-based finance instruments that repay investors based on an adaptation or resilience outcome. For example, in 2023, the World Bank issued a US$50-million outcome bond to finance a project that will make clean water available to two million school children in Vietnam and reduce GHG emissions by almost three million tonnes of carbon dioxide over the five-year period of the bond.[19] Another example is the World Bank's 2022 Rhino Bond.[20] The US$150-million five-year bond leverages private-sector investments to increase black rhino populations in the Addo Elephant National Park and the Great Fish River Nature Reserve in South Africa. Investors in the bond forgo coupon payments in favour of receiving a conservation success payment based on the final rhino population growth rate at maturity. The bond's structure ensures that funds are directed towards conservation activities, such as improving rhino protection, water supply, staffing, and training.

Domestic capital that is housed within pension funds is also considered to be able to mobilise private investment in resilience.[21] Despite pension funds in emerging regions experiencing rapid growth, they remain largely untapped for climate action. However, the local knowledge and interest in local economic growth among domestic pension fund managers can be leveraged for investing in small and medium enterprises and promoting locally crafted solutions that advance climate adaptation and resilience. That their investments are in the local currency adds a layer of security. Public development banks can also be partners in utilising this domestic capital, and scaling up their involvement will require building mandates and governance in line with sustainable development goals, enabling their access to low-cost credit, and building capacity for collaboration with local and international stakeholders.

The mounting demand for climate resilience technologies and solutions creates opportunities for private-sector investment in existing and new companies that produce these products and services. The increasing demand for technologies and solutions that can reduce the risks and impacts of climate change has generated multiple growth opportunities for investors. However, practical frameworks are required that can help investors take advantage of these opportunities and better understand climate resilience investments. A recent framework by the Global Resilience and Adaptation Working Group uses established, market-driven approaches to help investors identify companies that provide climate resilience and adaptation solutions, and accordingly create investment products to provide their clients with exposure to resilience and adaptation.[22]

The need to evaluate resilience attributes and impacts/outcomes associated with investments is a massive challenge. To help address this, the World Bank is working with other stakeholders to develop resilience metrics or frameworks, including via a Resilience Rating System that evaluates the quality and process of climate risk management and resilience building in investment activities. Another helpful resource to guide investments is the Climate Bond Initiative's recent Resilience Classification Framework[23] and resilience taxonomy[24] for different sectors.

As unprecedented climatic changes continue to impact global economic development, particularly in the most vulnerable nations, building resilience is imperative. Strong government leadership is required to prioritise resilience planning, budgeting, and communication of risk to the public, especially to affected communities. While finance for climate-resilient development is available, it is fragmented and limited. While there have been some promising developments in creating policy-enabling environments, innovative financing instruments, and resilience indicators to support public and private investments in adaptation and resilience, these examples must be built upon and scaled up through a coordinated, multi-stakeholder approach that involves governments, development partners, and the private sector.

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Multilateral Climate Funds as Catalyst for Adaptation Finance

Ornela Çuçi

THE HEADLINES OF 2023 WERE ALARMING, highlighting the massive toll of worsening climate change. They spoke of town squares turning into lakes due to heavy rain; of wildfires and storms leaving homes in ruins; of economies shattered and thousands of lives disrupted or lost. The reports continued before, during, and after the annual Conference of the Parties (COP28) on climate change held in Dubai in December 2023.

Our failure to ensure a safe planet for future generations is clear. 2023 has been recorded as the warmest year in history;[1] it is also the year in which floods, wildfires, cyclones, storms, and landslides peaked, killing 12,000 people globally—30 percent more than in 2022.[2] In the United States alone, climate change-induced events in 2023 led to trillions of dollars in losses.[3] Italy experienced its worst flood in a century, which was preceded by a drought.[4] There were also severe floods in African countries such as Somalia, Ethiopia, and Kenya, which affected 3.5 million people.[5]

Indeed, the situation has been worsening for half a century. According to the World Meteorological Organization (WMO), weather, climate and water-related hazards caused nearly 12,000 disasters between 1970 and 2021, with developing countries being the hardest hit. Nine out of every 10 deaths, and 60 percent of economic losses from climate shocks and extreme weather events,[6] were recorded in these countries.

To ensure our long-term existence on Planet Earth, its natural resources have to be conserved. Adopting sustainable practices is the only answer. Climate change is an emergency for every country, large or small. This has been globally recognised, culminating in the creation of the Green Climate Fund (GCF) in 2010 and adoption of its governing structure at the next COP in Durban (COP17) in 2011.

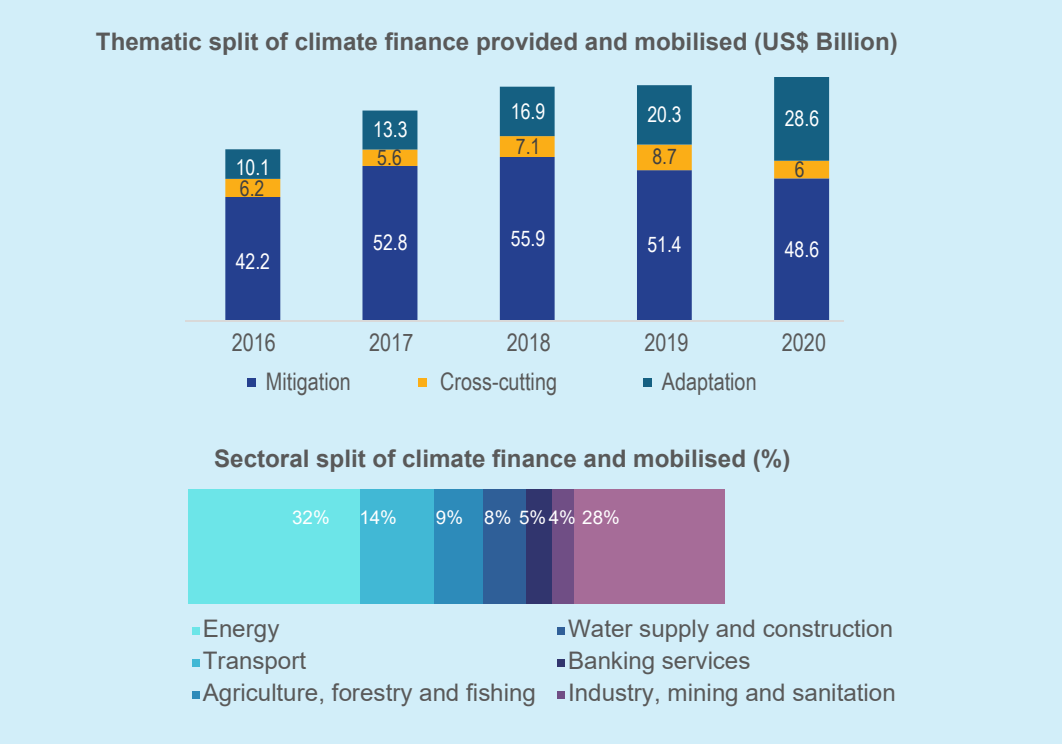
While primary funding focused on mitigation projects, with dedicated finances channelled through the Global Environmental Facility (GEF) and the Special Climate Change Fund (SCCF), the number of other climate-related funds has also grown substantially.

Data Gaps and Performance Metrics

At the COP16, held in Cancun in 2010, nations pledged to increase funding for "meaningful mitigation actions and transparency on implementation"[7] to US$100 billion every year by 2020. Though this target has not been achieved, it was reiterated at the COP21 in Paris in 2015[8] with the deadline, however, being extended to 2025.

Countries worldwide now need a new strategy to safeguard and sustain their natural resources, focusing on adaptive measures that tackle immediate dangers as well as ensure long-term ecological stability. In 2021, the climate finance provided by developed nations to developing ones rose to US$89.6 billion, an increase of 7.6 percent from the previous year and nearly double of what was disbursed in 2013.[9]

Figure 1: Overview of Climate Financing, 2016-2020



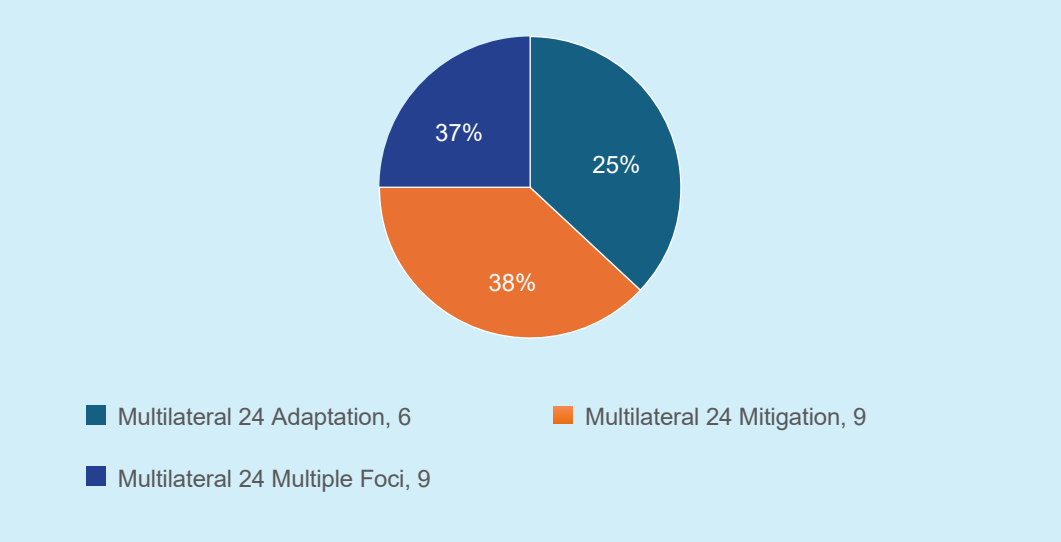
Source: OECD[10]

Total global climate finance has also risen, breaching US$1.3 trillion in 2022,[11] with substantial clean energy investments by countries such as China, the United States, Japan, and India.[12]

While this increase is a hopeful sign, the allocation of climate funds is not equitable for all aspects of climate change, especially adaptation financing. Adaptation finance has struggled to keep pace with the overall growth of climate finance, constituting only 28 percent of total climate financing in 2021-2022. An analysis of international public adaptation finance flows to developing countries estimated these flows at US$21 billion in 2021—marking a 15-percent drop from 2020.[13]

Indeed, funding of global adaptation also declined from 7 percent in 2019-20 to 5 percent in 2021-22.[14] It raises concerns about the importance implementing institutions are giving to adaptation finance.

Figure 2: State and Trends in Climate Adaptation Finance, 2023



Source: Climate Policy Initiative

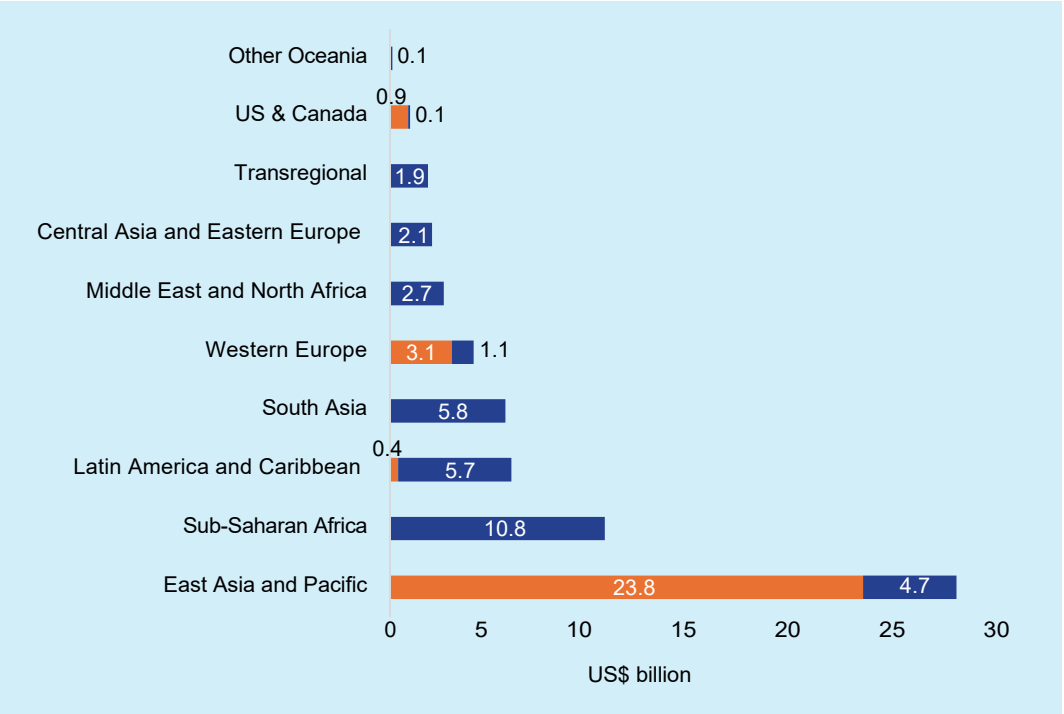
No doubt mitigation is important, but the reduced emphasis on adaptation finance is worrying, given the escalating physical and transitory risks posed by climate change. The absolute value of expenditure on adaptation finance so far has been US$63 billion, which is significantly lower than the annual estimated need of US$212 billion for developing countries by 2030.[15]

This huge gap is due to three reasons.

1. Unequal distribution between regions

Africa, the continent most affected by climate change, receives only 20 percent of global adaptation financial flows. In comparison, East Asia and the Pacific region receive 45 percent. The modest 14-percent increase in adaptation financing in Africa since 2019–20 shows the slow response to the region's urgent needs.[16]

Figure 3: Global Adaptation Finance, by Region and Sources (2021-22, in US$B)



Source: Climate Policy Update

2. Adaptation remains the priority of governments but not the private sector

The continued lack of engagement of the private sector in adaptation financing, which contributes less than 3 percent[17] to it, highlights an untapped potential. Providing incentives for private enterprises to invest in adaptation solutions can significantly increase available funds and promote innovative approaches to meet this pressing need.[18]

There is urgent need to give equal importance to adaptation and mitigation. It is found that only 1.4 percent of the US$94 billion made available between 2019 and 2021 under emergency response funding was used for adaptation funding, indicating a missed opportunity to integrate adaptation into emergency response more comprehensively.

3. Limited commitment of public financial institutions

The limited commitment by public financial institutions to adaptation finance also suggests the need for a more concerted effort.[19] While multilateral climate funds have led adaptation commitments in recent years, there is room for improvement, especially among multilateral development agencies, including equity funds and banks.

Impact on Sustainable Adaptation

As noted earlier, there is significant disparity between the adaptation needs of developing countries, mainly the least developed countries (LDCs) and the Small Island Developing States (SIDS), and the internationally funded budget made available to them. A 2023 report from the United Nations Environment Programme (UNEP) noted that the adaptation finance gap had been underestimated by nearly 50 percent earlier, and that it in fact stood between US$215 billion and US$387 billion per year.[20] What makes the situation worse is that although, as noted earlier, overall climate financing increased in 2020-21, the US$21 billion that went into adapatation was 15 percent less than in the previous year.

Adaptation finance needs a fresh approach to bridge the gap between planning and implementation. National efforts are not enough; it must be a global endeavour. It should include focusing on domestic budgets, international private finance, and innovative solutions, particularly the creation of a new fund for loss and damage due to climate change. The UNEP 2023 report showed that a little more than half of all global climate finance came from internal financing by the countries themselves.[21] This underscores the need for all countries, especially the developing ones, to build domestic capacity. But international support is also needed, not only in terms of funding, but also in helping LDCs and SIDS to formulate their Nationally Determined Contributions (NDCs) and develop the necessary standards of transparency and reporting.

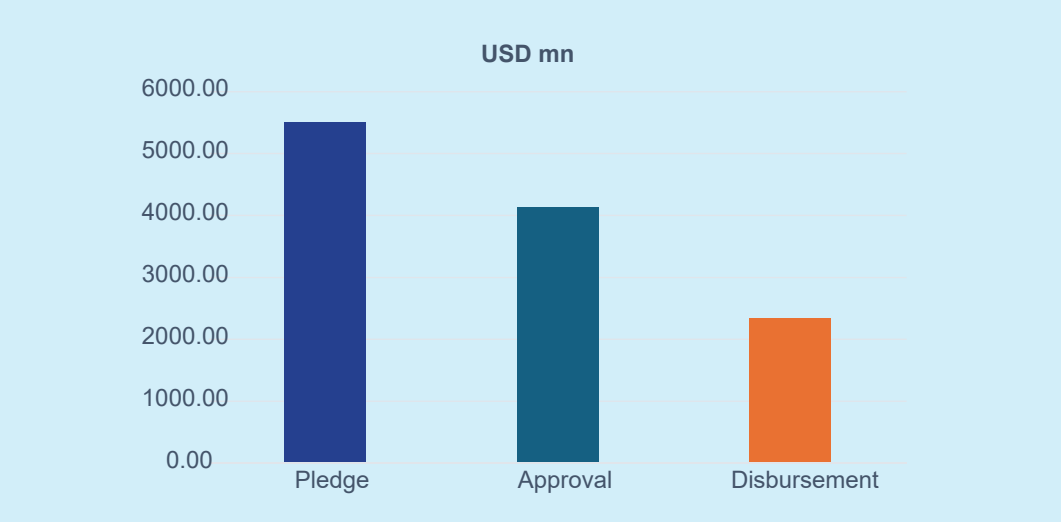
New adaptation projects worth US$559 million have been started in 2022 with grants from major climate funds. This is a positive trend, being a 10-percent increase over the average of 2017-2021.[22] The average size of grant-funded adaptation projects has increased, reflecting a possible shift towards more impactful initiatives. So far, however, research and evaluation on the impact of the adaptation initiatives have been far less than on mitigation-related projects.

The challenges confronting developing countries are not limited to getting financing alone, but also extend to regulatory and policy barriers as outlined in the following points:

- They face a constant conflict between ecosystem protection and economic development and need to find a balance between the two.
- They need to understand better how regulatory frameworks affect investment decisions.
- They need regulatory incentives in place for climate-friendly smart agriculture.
- There is lack of substantial fiscal autonomy related to negative social impacts from investments in infrastructure.
- They are hampered by inadequate understanding of data related to disaster losses and how infrastructure improvements can prevent them.
- There is private sector reluctance to invest in adaptation finance because of high initial costs.
- Adaptation requires multi-stakeholder solutions, which in turn introduce complexity and increase coordination challenges.
- Project preparation costs are often too high.
- There is lack of quality projects.

Some of these aspects can be visualised from the following diagrams.

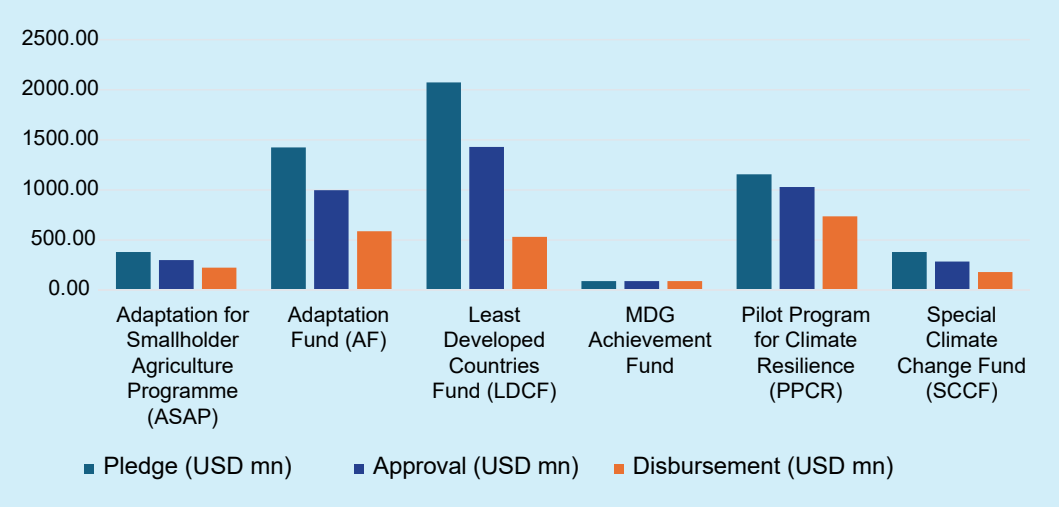
Figure 4: Adaptation Finance: Pledged, Approved, and Disbursed



Source: State and Trends in Climate Adaptation Finance 2023/Climate Policy Update

Figure 4 shows that though the discourse on adaptation keeps emphasising that funding is scarce, the difference between finances pledged and actually disbursed is also considerable.

Figure 5: Mobilisation, Allocation and Disbursement of Six Dedicated Adaptation Funds, 2023



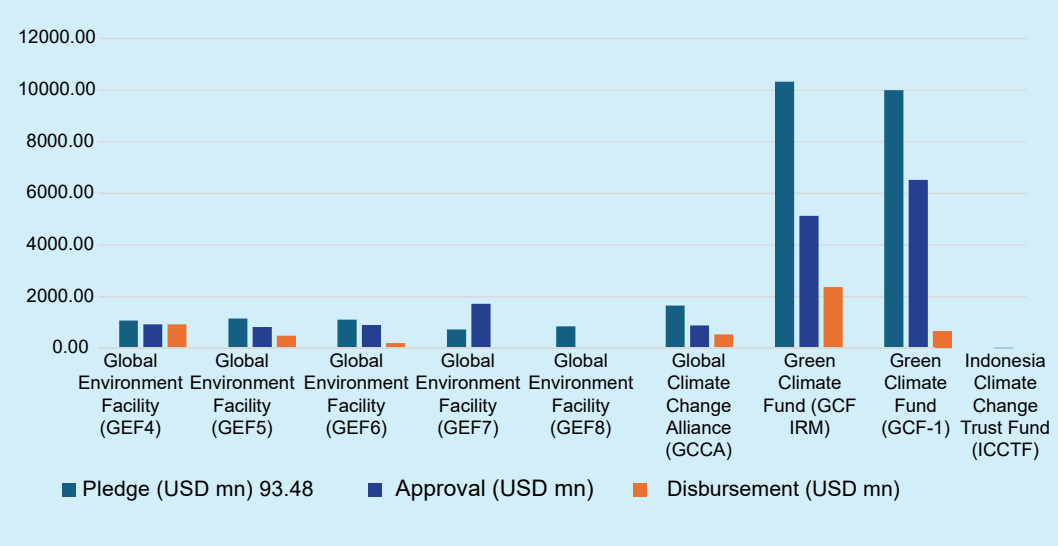
Source: State and Trends in Climate Adaptation Finance 2023/ Climate Policy Update

The graphs show that while the need for adaptation finance has been recognised and six dedicated funds set up, there is still fragmentation of the scarce resources provided. Once again, much less has been disbursed than promised.

The disparity becomes more glaring when the multilateral funds (Figure 6) allocated to adaptation alone are looked at.

This was recognised at the COP28, where the four main climate funds announced their joint commitment to increase the collective impact of climate finance. They aim to simplify access to funds, encourage joint programming and mobilize private sector finance for developing countries.

Figure 6: Source Mobilisation and Allocation for Adaptation Interventions by Multilateral Funds, 2023



Source: State and Trends in Climate Adaptation Finance 2023/Climate Policy Update

Recommendations

Global financial reforms are urgently needed to foster robust multilateral cooperation to effectively tackle the complex challenges associated with climate adaptation finance.

Adaptation finance is currently marked by fragmentation of funds, which creates hurdles in coordination. The fragmentation is seen in the diverse operational approaches, and leads to high transactional costs, lack of unified goals and targets, varied application processes, and lack of standardised monitoring and evaluation. This undermines the overall effectiveness of climate finance initiatives.

This article makes the following recommendations:

1. Consolidate adaptation finances under a single entity with strategically placed regional offices. This will optimise their management, fostering a more efficient, cohesive, and impactful approach. It will:

    a. Mitigate fragmentation: As noted, centralising adaptation finances will avoid unnecessary fragmentation of available funds, significantly reducing transactional costs and overhead expenses associated with managing multiple fund instruments.
    b. Prevent overlap: A unified entity will prevent inadvertent overlap of initiatives and investments, ensuring a more streamlined and effective allocation of resources.

2. Enforce unified accreditation and funding requirements. This will:

    a. Simplify the process for all entities seeking financial support, facilitate easier access to funding and promotes a more transparent and efficient allocation process.
    b. A unified approach will enable standardised reporting mechanisms, making it easier to measure the impact of financial contributions. This will ensure accountability and provide valuable insights into the effectiveness of climate finance initiatives.

3. Advance a robust and cohesive global adaptation agenda by leveraging unified country strategies.

4. Encourage the private sector to subsidise adaptation measures to bolster system stability and bring about advancements in knowledge and technology.

5. Empower developing countries with extensive know-how, technology, and resources to access climate adaptation finance.

Ornela Çuçi has 17 years of experience in environmental governance, climate diplomacy, climate financing, and has been a leading advocate for sustainable development and gender equity in the international climate dialogue.

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Financing Adaptation in Low-Income Countries: The African Perspective

Vera Songwe

THE GLOBAL COST OF CLIMATE CHANGE, if not reversed, could reach 12 percent of global GDP by 2030.[1] The burden, however, is not equal. In Africa, for example, many countries are today spending between 2 to 9 percent of their budgets on unplanned allocations to respond to extreme weather events.[2] Building climate-resilient societies through adaptation measures is economically more efficient and profitable for all.

Yet, despite global agreement on the importance of building resilience, funding remains inadequate, particularly in many developing countries. Adaptation investments, estimated to exceed US$250 billion annually until 2030,[3] are erroneously considered the primary responsibility of the public sector, with minimal or no profit margins, while emerging market economies prioritise investments in growth-oriented mitigation activities. There is evidence, however, that adaptation spending not only protects and enhances growth but also fosters climate-resilient economic development, which is crucial for achieving sustainable and equitable growth.

In the private sector, climate investments are increasingly seen as a lucrative asset class. The establishment of the Glasgow Financial Alliance for Net Zero (GFANZ) in 2021, representing 40 percent of global financial assets (US$150 trillion), underscores this shift. The challenge now is to mobilise capital towards adaptation efforts and resilience building in low-income and emerging market economies, rather than focusing solely on mitigation activities prevalent in advanced economies.

Effective adaptation efforts are the best value-for-money spending category in the climate challenge. They require collective action from countries, cities, development partners, and the private sector. These efforts must first focus on the development of vulnerability assessments of the relevant physical, social, and human infrastructure. For most developing countries the vulnerabilities are increasingly to agriculture; for coastal regions, meanwhile, the challenges are in marine and coastal life and infrastructure. Protecting the worlds peatlands,[a] for example—which cover only 3 percent of the world's land area but stores nearly 30 percent of its soil carbon equivalent to two times the world's forests[4]—is one of the most efficient adaptation expenses. By implementing comprehensive climate adaptation strategies, societies can enhance their resilience to climate change, protect vulnerable populations and ecosystems, and ensure sustainable development.

The Scale of the Challenge

Adaptation finance is estimated at US$250 billion annually.[5] Adaptation finance would continue to depend largely on the availability of public concessional resources until a clear investment case is adopted by the private sector. The 2021 Glasgow Climate Pact adopted at COP26 urged developed nations to at least double their collective provision of adaptation finance from 2019 levels by 2025. As weather events amplify, the costs of adaptation will increase, and countries and regions that are less prepared will suffer the highest costs. The costs may even differ within countries and between municipalities in the same country.

For the developing world, and Africa in particular, strategies for building adaptation and resilience must be linked to those for green growth. Africa, and South Asia too, both remain lacking in some of the most basic development infrastructure. They can therefore use the exercise of building resilience and climate proofing their economies

a The peatlands are a natural flood control and water supply canal and are an important biodiversity store.

as a growth driver which simultaneously provides more resilient infrastructure and protects valuable ecosystems while providing jobs and protecting the planet.

Even as adaptation efforts are needed by all, countries in low-lying coastal areas are particularly vulnerable to sea-level rise, storm surges, and coastal erosion. Small island developing states (SIDS) are especially at risk due to their exposure to extreme weather events, saline intrusion into freshwater sources, and limited land area for adaptation measures. Arid and semi-arid regions, such as those in Africa and parts of Asia, face challenges related to water scarcity, desertification, and agricultural productivity losses, increasing food insecurity and livelihoods risks.

Regions that experience more frequent and intense extreme weather events—such as those in the Asia-Pacific, Africa, and the Caribbean—face massive adaptation challenges and costs. These include small island developing states (Maldives, Seychelles, and Kiribati); coastal nations with densely populated coastal areas, including Bangladesh, Vietnam, and the Philippines; and African countries in the Sahel region and Sub-Saharan Africa (e.g., Niger, Chad, and Somalia). Yet, the consequences of extreme weather events have spillover effects on the entire global community.

Sectoral Investment Needs for Climate Adaptation

Investing in resilient infrastructure, such as disaster-resistant buildings, improved agriculture flood defences, coastal protection measures, and water management systems can help reduce vulnerability to climate-related hazards and ensure critical services continue during extreme events.

Africa is facing pressures on housing availability and cost, and the risks of destruction due to extreme weather events. According to the Centre for Affordable Housing Finance,[6] Africa is experiencing a massive housing deficit of over 51 million units, creating hardship and vulnerability for individuals, families, and communities, while most of the built houses do not respond to climate-resilient specifications. The countries with the largest housing shortages are Nigeria, with a deficit of 28 million units, the Democratic Republic of Congo, with a deficit of 3.9 million units, and South Africa, with a deficit of 3.7 million units. There is opportunity for collaboration between the public and private sectors to develop resilient technologies that improve outcomes after floods and better withstand heat waves.

Resilient green housing finance remains in its infancy; a patchwork of mainly private-sector green building initiatives using hard-to-compare criteria has hindered market integrity. Promoting greater international comparability and transparency of green building standards would facilitate the alignment of green real estate assets with the net-zero emission target.

Countries need to undertake assessments of their housing vulnerability and develop guidelines for how to address the weaknesses identified. This should include amendments to building codes, regulation concerning the issuance of building permits linked to geo analysis of location. Mandating of insurance coverage and other risk mitigation measures. Housing and environmental policies are highly decentralised in many countries so this will require extensive coordination and monitoring. However, only if this level of coordination and oversight exists can governments support the development of more resilient housing for their citizens.

The energy sector is typically seen as a mitigation sector and a lot of the current literature has focused on how changes in energy use and energy sources can help reduce or slow the impact of climate change. In more recent years, there has been increasing agreement in the literature that energy can also play a role in the adaptation front. Many climate change adaptation strategies require considerable energy use, yet the role of reliable, affordable, and modern renewable energy services in climate adaptation is not widely acknowledged in policymaking or practice.[7]

Renewable energy can serve as a technology for adaptation in a number of areas such as water, food, agriculture, forestry, remote locations, small islands, and coastal areas. The principal way is by allowing for the development of resilient energy systems in hard-to-reach areas, providing adequate capacity to small rural communities for the electrification of their homes and storage of food and medicines. Communities that are prone to natural disasters can migrate to renewable energy devices as a means of adapting to the uncertainties. An example is hurricane-prone communities who move from centralised grid connections to more micro grid dependence powered by renewable energy.

With the increasing affordability and accessibility to renewable energy, the use of renewable energy solutions for adaptation has increased substantially.

In the housing and energy sectors, as the examples above show, even as improvements are being made to either change and improve practices to better adapt or build from the ground, more resilient infrastructure, extreme weather events may still pose substantial risks. Innovative technologies and insurance will be needed to help address persistent shocks.

In each decade over the last century there have been more natural disasters than in the preceding one. Over 4.2 billion people have been affected by these disasters with an economic cost of about US$2.9 trillion.[8] The last 20 years have seen the number of massive floods more than double, from 1,389 to 3,254, while the incidence of storms increased from 1,457 to 2,034. Floods and storms were the most prevalent events. While adaptation efforts are important, disasters will continue to impact lives and livelihoods.

Disaster prevention activity can save lives and reduce costs. Investing US$800 million in Multi-Hazard Early Warning Systems (MHEWS) in developing countries would prevent losses of US$3 to US$16 billion annually.[9] Torrential rains and flash floods ripped through parts of East Africa in 2023, killing more than 350 people and displacing over one million across Somalia, Kenya, Ethiopia, and Tanzania.[10] These floods affect countries across the globe. India, for example, suffered the third highest losses in the region on account of flooding, amounting to over US$4.2 billion in 2022.[11] Flooding has the greatest impact in Asia in terms of fatalities and economic damages.

Effective MHEWS system can prevent losses and help with adaptation. Improving access to climate information, early warning systems, and risk assessments can enable timely decision-making and proactive responses to climate-related hazards, reducing vulnerability and enhancing preparedness. Understanding these recurrent patterns allows for accurate information dissemination in a timely manner.

Financing the Adaptation Gap

The adaptation finance gap in developing countries is likely five to 10 times greater than current international adaptation finance flows and continues to widen. Country-owned adaptation transition plans that integrate climate resilience, sustainable development,

and low-carbon transitions are becoming commonplace in Africa. Some examples of countries with notable adaptation transition plans are South Africa and Rwanda.

South Africa has adopted a National Climate Change Response Policy (NCCRP) that emphasises adaptation as a priority for climate action. The NCCRP aims to mainstream climate adaptation into policy, planning, and implementation processes across sectors. South Africa's adaptation efforts focus on sectors such as water resources, agriculture, biodiversity, human settlements, and disaster risk reduction, incorporating climate resilience into development planning and decision-making.

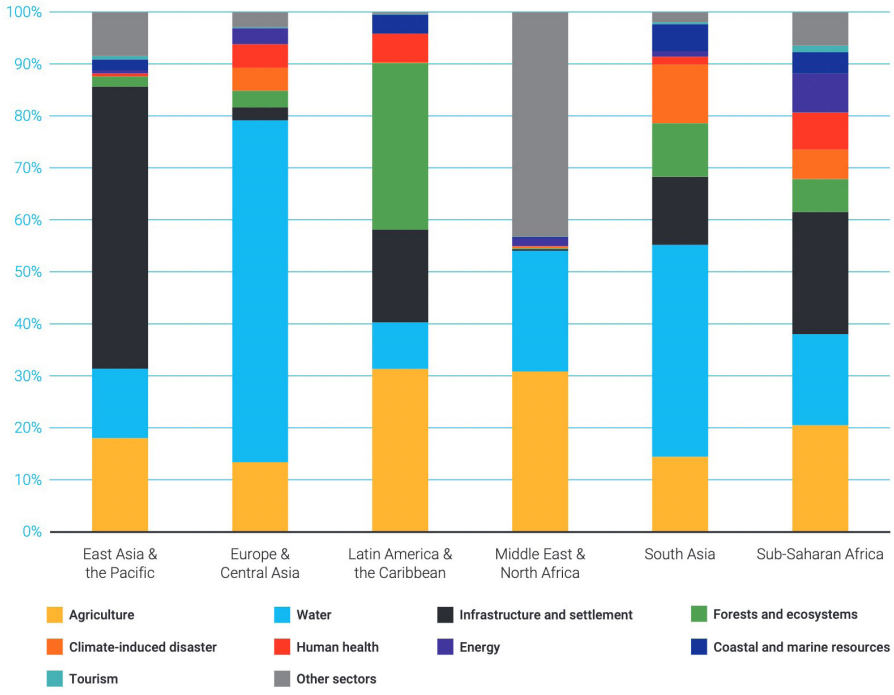
Rwanda, for its part, has put in place a National Climate Change and Environment Management Policy that emphasises adaptation as a key priority for climate action. The policy aims to mainstream climate adaptation into sectoral policies and strategies, enhance resilience in vulnerable communities, and promote ecosystem-based adaptation approaches. Rwanda has also developed a National Adaptation Plan (NAP) that identifies adaptation priorities and actions across sectors such as agriculture, water resources, infrastructure, and health.

Financing of adaptation plans, however, is a barrier. UNEP's 2022 Adaptation Gap Report[12] estimates that the annual cost of adaptation in developing countries alone will be between US$160-340 billion by 2030, which suggests that public budgets alone will not be able to address the financing challenge.

Developing innovative financial instruments, such as climate risk insurance, catastrophe bonds, and microfinance schemes, can help transfer and manage climate-related risks, providing financial protection to vulnerable communities and sectors.

Bridging the adaptation finance gap requires more international, domestic and private finance, ideally a reform of the global financial architecture, and better international cooperation. Domestic expenditure and private finance are important sources of adaptation finance, but quantitative estimates are not yet available because their flows remain difficult to track. Nonetheless, domestic budgets are likely to be a large source of funding for adaptation in many developing countries.

Figure 1: Sectoral distribution of adaptation finance needs by world regions, presented as a percentage of total finance needs for the respective region



The figure above shows that all countries need to address issues of adaptation. However, different regions must address different parts of the challenge. Most important is the need for global collaboration to support sharing solutions and techniques. Africa, Asia and Europe and Central Asia still have important segments of their economies that need to adapt proportionately. Tourism stands out in Latin America; infrastructure in East Asia; and water in Europe and Central Asia.

Mobilising financial resources, technology transfer, and capacity-building support from developed countries, international organisations, and the private sector is important. Yet most essential will be ensuring the right resources are going to the right areas to fund the right solutions.

Despite increasing recognition of the importance of climate adaptation, funding for adaptation projects remains insufficient compared to those for mitigation. Many vulnerable countries, particularly the LLMICs, lack the financial resources and technical capacity to implement adaptation measures effectively. International climate finance mechanisms, such as the Green Climate Fund, have struggled to mobilise adequate resources for adaptation projects, leading to significant gaps in funding.

Climate adaptation is inherently complex and context-specific, requiring tailored approaches that address diverse climate risks, vulnerabilities, and socioeconomic conditions across regions and sectors. Uncertainty about future climate scenarios, the timing and magnitude of climate impacts, and the effectiveness of adaptation measures complicates decision-making and planning efforts, often leading to inertia and delays in action.

Countries, particularly LMICs, face challenges in accessing and applying climate science, data, and tools to inform adaptation planning and decision-making. Weak institutional capacity, governance structures, and absence of technical expertise in vulnerable countries impede the design, implementation, and monitoring of adaptation measures, exacerbating their vulnerability to climate change.

The international multilateral system plays a crucial role in funding climate adaptation plans and projects in developing countries through various mechanisms and initiatives. The following are some of the funds dedicated to climate action.

The Green Climate Fund (GCF) is one of the primary multilateral financing mechanisms dedicated to supporting climate adaptation and mitigation projects in developing countries. Established under the United Nations Framework Convention on Climate Change (UNFCCC), the GCF provides grants, concessional loans, and other financial instruments to support adaptation activities, including vulnerability assessments, adaptation planning, and the implementation of adaptation projects.

The Climate Investment Funds, including the Pilot Program for Climate Resilience (PPCR) and the Scaling Up Renewable Energy Program (SREP), provide financing to support climate resilience and adaptation efforts in developing countries. These funds aim to leverage public and private investments to address climate change challenges, promote sustainable development, and enhance resilience to climate impacts.

The Global Environmental Facility (GEF) supports climate adaptation projects and programs as part of its broader mandate to address global environmental issues. The GEF provides grants and concessional financing to support adaptation activities in developing countries, including capacity-building, technology transfer, and ecosystem-based adaptation initiatives.

Bilateral and multilateral development agencies, such as the World Bank, regional development banks, and national aid agencies, play a critical role in funding climate adaptation projects and programmes in developing countries. These institutions provide concessional loans, grants, technical assistance, and capacity-building support to help countries integrate adaptation into their development planning and implement adaptation measures. A lot of this work is done with the support of philanthropy.

The recent streak of successive crises has stretched the balance sheets of most economies. Low-income and developing countries will need grants and highly concessional financing to deal with the climate challenge as their fiscal space has been closed to additional investment expenditure without additional and substantial new resources. The issuance of new climate Special Drawing Rights, additional global taxation initiatives, carbon financing and improvements in DRM could all help to contribute additional funding for adaptation initiatives. The IMF's use of SDRs to create the Resilience and Sustainability Trust is a bold first step in the use of SDRs for climate. However, more is needed to effectively deal with the magnitude of the challenge while protecting low-income economies in particular.

The private sector is working with the multilateral development banks to develop financing mechanisms, such as climate bonds, green bonds, impact investments, and resilience bonds, to mobilise private capital for climate adaptation projects and initiatives. These mechanisms leverage financial markets to attract investment in adaptation solutions and promote sustainable development pathways.

Overall, the multilateral system for adaptation plan funding relies on a combination of public and private resources, partnerships, and innovative financing mechanisms to mobilise investments and support climate resilience-building efforts in developing countries. By leveraging diverse funding sources and collaborative approaches, the multilateral system aims to scale up support for adaptation and promote sustainable development in a changing climate. The availability of vulnerability assessments, adaptation strategies and better information regarding incidence by country and sector allows for more efficient targeting of adaptation strategies. The remaining challenge is to raise sufficient resources to match the scale of the challenge by 2030.

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Loss and Damage Finance: Progress, Realities, and the Waiting Game

Nivedita Joshi and Harjeet Singh

IN 2020, CYCLONE AMPHAN[1] affected 13 million people in West Bengal, India, and caused over US$13 billion in damages. In developing countries, economic loss and damage from climate change is estimated to cost US$290-580 billion per year by 2030,[2] excluding non-economic losses and damages.

Extreme weather and climate events from anthropogenic activities will only continue to rise. Intergovernmental Panel on Climate Change (IPCC) projections indicate that, under a high greenhouse gas (GHG) emission scenario, global temperatures could rise by as much as by 4.4°C by 2100.[3] This will lead to exacerbated weather events, including more frequent and intense heat waves, droughts, floods, hurricanes, and wildfires, which will pose significant risks to human health, infrastructure, agriculture, and natural ecosystems. Disproportionate vulnerabilities are stark, with poor and marginalised communities twice as vulnerable to climate disasters than those with more resources.[4] Socioeconomic constraints force such communities to reside in areas more prone to climate-related hazards, like floodplains, coastal areas, unstable

slopes, and drought-prone regions. When extreme weather events occur, they face heightened risks of loss of life, displacement, and livelihood disruption. Moreover, they lack the financial resources and social safety nets to recover from such events, thus perpetuating cycles of poverty and vulnerability.

In India, 70 percent of households that are largely dependent on agriculture struggle with lower yields due to frequent droughts and extreme rainfall events,[5] which leads to food insecurity and financial instability. This extends to urban areas, where inadequate housing exposes the urban poor to health and productivity threats from rising temperatures. The fragility of critical ecosystems compounds the crisis; for instance, the Himalayan glaciers, which are crucial sources of water during dry periods, are at risk. With a third of these glaciers predicted to disappear by 2100,[6] the cascading effects on flooding and drought will threaten agrarian mountain communities. This warming trend has serious economic ramifications; even with a 1°C rise in temperature,[7] India could face a 3 percent loss in Gross Domestic Product (GDP), pushing 50 million more people in the country into poverty.

Middle-income countries (MICs) like India face multiple challenges in addressing loss and damage. Despite being more developed than least developed countries (LDCs), MICs struggle with the impacts of climate change and lack the resources to invest in both adaptation and recovery. The new Loss and Damage Fund[8] enables MICs to recover and rebuild their economies following climate change impacts; however, ensuring equitable access and tailoring the fund to the unique needs of each country is crucial.

Understanding Loss and Damage

The action on Loss and Damage (L&D) has spanned over three decades.[9] The concept originated in the early 1990s and was proposed by the Alliance of Small Islands States (AOSIS) to seek compensation for losses caused by rising sea levels. In 2013, the Warsaw International Mechanism for Loss and Damage associated with Climate Change Impacts (WIM) was established at COP19 in Warsaw; at COP25 in Madrid in 2019, the Santiago Network was established to facilitate technical assistance for loss and damage. Another major development was the establishment of a Loss and Damage Finance Fund at COP27 in Egypt, followed by an agreement at COP28 in Dubai to operationalise the Loss and Damage Fund on the first day of COP28 under World Bank hosting rules.

The definition of "loss and damage" in the broader policy arena remains ambiguous, which creates significant hurdles to addressing issues. This is because countries disagree on who should pay for the harm caused by climate change (liability and compensation) and because developed countries have historically emitted more greenhouse gases than developing countries[10]. As per the United Nations Framework Convention on Climate Change (UNFCCC), the working definition of loss and damage is "the actual and/or potential manifestation of impacts associated with climate change in developing countries that negatively affect human and natural systems." However, this definition leaves much to be desired. In 2014, the definition acknowledged that "L&D associated with the adverse effects of climate change includes, and in some cases involves more than, that which can be reduced by adaptation."[11]

This is also emphasised in the literature, where loss and damage are considered to arise from communities surpassing their adaptation limits.[12] This highlights the impacts of climate change beyond the scope of combined adaptation and mitigation efforts.[13] Mechler et al.[14] include impacts from both sudden and slow-onset events within the scope of loss and damage. The IPCC recognised loss and damage in its special report,[15] making it the most recent addition to the loss and damage policy arena.

While the aforementioned definitions are widely accepted within loss and damage scholarship, a clear definition of loss and damage from climate change remains elusive due to several factors.[16] These include concerns about liability, as developed nations, which are historically the biggest polluters, are reluctant to acknowledge culpability[17] and accept compensation claims from developing countries. Further, attributing specific losses and damages to climate change is challenging. Even with advances in attribution science, it is difficult to separate the influence of climate change from other factors.[18] Nevertheless, attribution science has made it possible to estimate the extent to which climate change has contributed to specific events, even if it is not possible to attribute every loss or damage to climate change alone. This should be sufficient information for developed countries to recognise their role in contributing to climate change. Additionally, developed countries have a moral and ethical obligation to support developing countries that are disproportionately affected by climate impacts.[19]

Slow-onset and extreme weather events linked to climate change are causing economic and non-economic damage in developing countries.[20] While economic losses receive

more attention, the hidden cultural and social costs, which are often borne by the poorest, remain inadequately studied. While the focus on quantifiable loss and damage is essential to develop funding metrics, it overlooks the toll of fractured identities and lost knowledge. The new Loss and Damage Fund marks a significant step towards addressing the full spectrum of climate impacts in developing countries, which include cultural heritage loss, displacement due to rising sea levels, and the loss of traditional ways of life.

This broader recognition creates new avenues for gathering evidence, which will be crucial for informing future interventions and ensuring that the fund addresses both immediate financial needs and long-term challenges posed by NELD.[21] Communities that are directly affected by climate change can now participate in documenting the impact. Therefore, the fund creates a strong incentive for developing better metrics to assess and quantify NELDs alongside economic losses.

Studies like those by PLOS Climate[22] highlight the need for holistic approaches that integrate social and economic factors in hazard probabilities. In India,[23] climate disasters create infrastructure damage, deepen gender divides, and create increased vulnerabilities, violence, and social inequalities. Acknowledging the conceptual, methodological, and empirical gaps in defining and assessing economic and non-economic losses and damages, especially across diverse states and hazards, is crucial. Additionally, accurately counting and preparing for escalating climate impacts is critical.

The Role of Equity and Justice in Addressing Loss and Damage

Securing financial support for addressing loss and damage associated with climate change remains a challenge for developing nations despite international agreements and mechanisms such as the WIM.[24] The current funding landscape suffers from a resource gap,[25] with developing countries burdened with shouldering the costs[26] associated with climate disasters despite being the least responsible for their causes.

The complexity of existing mechanisms to fund climate action poses another challenge. These mechanisms often have convoluted application procedures, which make it difficult for countries with limited administrative capacities and resources to access finance.[27] This also results in vulnerable communities being unable to

access financial support to address their urgent need for resources to mitigate losses and damages.[28]

Further, eligibility criteria typically overlook vulnerable nations beyond LDCs and Small Island Developing States (SIDS), which are particularly vulnerable[29] and face significant losses and damages from severe weather events. However, countries such as India, Colombia, Nigeria, and Pakistan face unique challenges in accessing funding.[30]

The complexities associated with their eligibility and equity can be attributed to their distinct geographical and socioeconomic contexts, where existing vulnerabilities amplify the effects of environmental changes. Despite experiencing severe weather events, rising sea levels, and biodiversity loss, the eligibility of these nations for climate finance, which is earmarked for LDCs and SIDS, is often ambiguous and hinders their ability to effectively address the challenges posed by climate change.

Historical Responsibility and a Call for Justice

In light of India's increasing emissions, it is crucial to examine its role in the climate burden. While an initial evaluation[31] places India higher than the United Kingdom (UK) in terms of cumulative historical CO_2 emissions during 1850-2021, a more comprehensive analysis that considers colonial influence presents a different perspective. A second study[32] indicates that, during British rule, India's emissions were dictated by external forces, potentially shifting the accountability to former colonisers such as the UK. When factoring in colonial emissions, the UK's historical share nearly doubles from overseas emissions under colonial rule. This further highlights the inequalities embedded in the climate crisis, where developed nations like the United States (US) (with a 21 percent historical responsibility) and the UK (5.1 percent, including colonial emissions) bear a greater responsibility for past actions while countries like India grapple with the consequences.

Addressing loss and damage from climate change demands a recognition of equity and justice, particularly in light of the severe consequences for vulnerable nations. The historical inertia of developed nations, which bear the primary responsibility for environmental degradation, has resulted in a lopsided burden on developing countries, which have contributed minimally to the climate crisis but disproportionately suffer its impacts. The realities of rising sea levels, extreme weather events, and ecosystem

collapse underscore the need for rectifying this historical injustice, necessitating a fair distribution of responsibilities.

Problems with the Current L&D Fund

The selection of the World Bank as the Loss and Damage Fund trustee and host has not been well received by several developing nations.[33] The World Bank has historically favoured agendas that contradict the interests of developing countries, including through its investments in fossil fuels. This raises serious questions about its impartiality in managing the fund. It is crucial to ensure complete autonomy for the fund during decision-making and implementation. Any undue influence from any party, including the World Bank, could jeopardise the fund's core mission. The goal should be a fully independent entity, separate from the Bank's structure, with its own legal identity. Only then can the fund function with the legitimacy and effectiveness required to tackle the challenges of climate change.

The current framing of the Loss and Damage Fund as "support" for developing countries grappling with present and future climate impacts is more acceptable to developed nations. However, the fund as compensation for past harms cannot be overlooked. Wealthy countries must acknowledge their historical actions and contribute financially, reflecting their responsibility and aligning with the scale of the requirements. Further, ambiguity around the metrics for quantifying non-economic losses may complicate fund allocation, with developed nations potentially favouring stricter economic criteria. Attributing specific losses solely to climate change can also risk lengthy debates and delays. A rights-based approach focusing on the equitable needs of vulnerable communities in all developing countries, irrespective of exact attribution, might be more just and feasible.

Actions and Frameworks for a Fairer Solution

Resource scarcity, gaps in expertise, and cumbersome funding mechanisms expose communities to climate impacts like displacement and livelihood loss[34] while effective policy responses languish in a bureaucratic limbo. To rectify this imbalance, developed nations must assume a greater role in providing financial support and undertaking mitigation efforts. Recognising their historical culpability, adherence to the "polluter pays" principle is imperative.[35] Meagre financial reparations alone are insufficient to redress the deep-seated trust deficit between nations. The transfer of technology

and knowledge sharing in addition to financial contributions are crucial to empower developing countries to build climate-resilient infrastructure and reduce emissions on their own terms. This support must be guided by the principle of common but differentiated responsibilities, which recognises the distinct historical contributions and current capacities of countries.[36] Building trust requires accountable and equitable actions. Frameworks like the Climate Equity Reference Framework (CERF)[37] offer a robust method for assessing nations' fair contributions to loss and damage finance.

Conclusion

For decades, vulnerable nations and civil society groups have pushed for a fund to address loss and damage. The establishment of the Loss and Damage Fund is a crucial step towards recognising the unequal burden of climate change and taking equitable action. However, the fund's effectiveness needs to be ensured. It also needs to be scalable and flexible enough to grow and meet the evolving needs of communities and countries. Further, it needs to be accessible for the communities and indigenous peoples that need it most. Finally, its impact needs to be tangible, delivering real support that aligns with the principles of equity and climate justice. The fund's true impact lies in its ability to foster solidarity and cooperation, while holding nations accountable for their responsibility to protect the most vulnerable populations. Its evolution will set the stage for future climate policies and demonstrate the international community's commitment to safeguarding human rights in the face of a changing climate.

India's extreme climate vulnerability necessitates moving beyond traditional assessments. Analysing factors like social and economic impacts alongside hazard probabilities is crucial for crafting effective climate policies. Comprehensive loss and damage assessments require overcoming data gaps and leveraging India's strengths to build resilience and share expertise. In this context, India's intellectual capacity holds the potential for bolstering its own initiatives and fostering collaborative solutions towards learning from those confronting comparable challenges and assisting other vulnerable developing countries.

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Conclusion: Demystifying Adaptation Financing

Nilanjan Ghosh

To begin the end…

"Cecil Graham: What is a cynic?

Lord Darlington: A man who knows the price of everything, and the value of nothing.

Cecil Graham: And a sentimentalist, my dear Darlington, is a man who sees an absurd value in everything and doesn't know the market price of any single thing."

— Oscar Wilde, *Lady Windermere's Fan, A Play About a Good Woman*

The essays in this volume have sought to examine various facets of adaptation financing, where current gaps are resulting in massive challenges. As argued in this volume, the financing gap exists due to the inability of market forces to acknowledge the importance of adaptation financing. This is where the classification of the 'cynic' and the 'sentimentalist' from Oscar Wilde's comedy comes into play. Adaptation financing has fallen

into the crack of high value not being acknowledged in the market framework (price, as a market-based phenomenon, used figuratively here).

For a majority of nations, the timeline to achieve the net-zero targets is between 2050 and 2070. Adaptation is imperative for the survival of humanity and the protection of lives and livelihoods against global warming and climate change during this period. This concern is more immediate for vulnerable regions of the Global South.

The United Nations Environment Programme's 2023 Adaptation Gap Report reveals that the financial needs of developing countries are 10-18 times the current global financial flows.[1] To protect themselves against climate impacts, developing nations require US$215 billion annually in this decade. However, the cost of implementing domestic adaptation plans is even higher, at US$387 billion per year.[2] Despite the urgent need for action, public multilateral and bilateral adaptation finance decreased by 15 percent in 2021, falling to just US$21 billion. As a result, the adaptation finance gap has widened and is today estimated to be anywhere between US$194 billion and US$367 billion annually from 2023 to 2030. Where will this money come from?

Financial institutions (e.g., Multilateral Financial Institutions (MFIs) and Development Financial Institutions (DFIs)) have a preference for mitigation projects,[3] especially those involving energy transitions; adaptation receives secondary treatment. Such biased financing portfolios are the result of a lack of return on investment (RoI) from adaptation projects compared to mitigation projects, which are associated with a perceptible economic rate of return in the short run. Adaptation projects are mostly associated with the creation of "public goods"[4] with imperceptible short-term economic rates of return but high long-term social rates of return. Such long-term social returns on adaptation present a strong business case only when businesses are considering sustainable bottom lines through the creation of sustainable value chains. According to the Global Commission on Adaptation,[5] a US$1 investment in climate adaptation could yield four times the net benefits within a decade, mostly through a range of regulating services that include reduced disaster losses, higher crop yields, and better public health.

To extend Oscar Wilde's metaphor, adaptation financing suffers from the 'cynicism' of funding agencies, which prefer to follow short-term market signals and, in the process, overlook the need for long-term social returns.

Key Imperatives

The imperatives for adaptation financing are both epistemological and ethical. In consonance with the "positive" theory,[a] the epistemological imperative pertains to the social cost of carbon (SCC), delineated in the form of the monetary value of damages caused by an additional unit of carbon emission. Mitigation initiatives such as electric vehicles (EVs), solar power projects replacing fossil fuel-based energy, and nature-based solutions like mangrove regeneration resulting in carbon sequestration directly curtail atmospheric carbon levels, which helps avert substantial SCC. While adaptation projects do not directly curtail carbon emissions, they help reduce SCC by strengthening community resilience. Therefore, underfunding climate adaptation increases the SCC. Conventional financing frameworks, in pursuit of short-term bottom lines, are oblivious to the costs of a lack of adaptive resilience. These include aggravated public health and safety risks, infrastructure and property damage, and detrimental effects on ecosystems and biodiversity—factors that impede their capacity to provide ecosystem services.

The "positive" consideration segues into the "normative" theory, which raises the fundamental ethical concerns of equity and distributive justice. This also has historical bearing; the Global South has received the brunt of the consequences of unsustainable consumption patterns of the Global North. With large parts of the developing world charting their pathways towards achieving net-zero targets, a phased and equitable transition becomes imperative. However, with the timelines of net-zero targets for almost all major economies being pegged between 2050 and 2070,[6] humanity has 25-45 years to adapt to the adverse consequences of climate change. In this context, stimulating community resilience becomes paramount.

The paucity of investment in adaptation strategies could have long-term social and economic repercussions, including those of food insecurity, health impacts, and physical infrastructure losses. Further, the irreversible harm to ecosystem structures and functions due to climate change will impair ecosystem services that have an inextricable bearing on lives and livelihoods in the developing and the underdeveloped regions. Mitigation alone cannot address these issues; instead, robust adaptation

a "Positive" theory attempts to explain the working of systems in a value-free way, in contrast to the "normative" theory, which brings in "value-judgmental" concerns in the working of systems.

measures are required to enhance the resilience of communities to counteract these adverse impacts.

The example of the Indian Sundarbans Delta (ISD) can help understand both the positive and normative positions. The archipelago,[b] located in the state of West Bengal in India, is under serious threat, with land losses caused by land subsidence as a result of sea-level rise and the diminishing supply of sediment caused by sediment trapping by upstream constructions inhibiting soil formation. The two pressure points emerge from two different directions, leading to the shrinkage of the delta.[7]

Further, rising sea levels and declining freshwater flow have led to saline water intrusion, with seawater replacing freshwater in creeks and canals, which in turn has harmed agriculture. Although there is a reduction in the overall frequency of storms, depressions, cyclones, and surges, the proportion of high-intensity events is increasing, likely due to rising sea surface temperatures.[8] In this context, a 2019 paper[9] advocated a strategic organic retreat from climatically vulnerable areas and ecosystem regeneration in the vacated regions to save the population in the delta. It has been argued that this approach is economically more advantageous than the current scenario of non-adaptation.

Despite the promise that such adaptation schemes hold, they have been overlooked by policymakers and local politicians. This is largely because of the large-scale apprehension that a scheme like a strategic retreat might encounter community-level resistance, thereby emerging as prominent factors for anti-incumbency during elections. In other words, while such schemes are devoid of any political dividends for a political dispensation, they can prove to be counterproductive. This approach highlights a myopic vision and a lack of acknowledgement of existing threats by political leaders and policymakers from developmental (especially life and livelihood) perspectives. However, even if such a situation is circumvented with the arrival of visionary leaders, this project is the perfect prototype of an adaptation project where short-term RoIs are imperceptible, and therefore, funding will be a challenge.

b It consists of 93 islands, of which 54 islands are classified as protected areas and 39 have human habitation. These are recent figures, derived from the Sundarbans Master Plan for Integrated Delta Development prepared by the Water Resources Investigation and Development Department, Government of West Bengal, in cooperation with WB Irrigation & Waterways Department and Pieter-Paul van Meel, IWRM Expert of The Netherlands, 2022.

The Causes of the Chasm

The adaptation financing gap faces several challenges. The first challenge is the RoI. The long gestation periods and imperceptible short-term economic returns do not make adaptation financing seem worthwhile. Second, the "public goods" nature of adaptation projects often leads to non-excludability and non-rivalry in consumption, which creates problems in identifying beneficiaries for charging "user fees". This becomes associated with the lack of a cost-recovery mechanism, deterring private-sector participation in financing. The third challenge is identifying appropriate sectors for financing adaptation efforts due to a lack of understanding of on-ground adaptation activities. The fourth challenge is differentiating between adaptation and development projects, which are often indistinguishable. Accommodative or adaptative infrastructure projects like the construction of bridges or embankments are often construed as development projects rather than adaptation projects. Regulatory and governmental policy interventions could help, but there is an absence of policy initiatives to incentivise or channel funds in this direction.

The fifth challenge is the complexities associated with adaptation projects, which often require a multidimensional "whole-of-society" approach. Unlike mitigation, which has clear business cases in the form of straightforward measures like switching to renewable energy, adaptation projects require a substantially nuanced approach. For instance, a project like a strategic retreat requires a holistic understanding of community features, societal and cultural nuances, aspirations, counselling and reskilling, physical capital development, and job creation, and will be associated with extensive threat points that can include community backlash for inadequate rehabilitation.

The Adaptation Financing Gap in India

In India, the states are primarily responsible for adaptation-related interventions. In recent years, many Indian states have emphasised the need for substantial investments in adaptation, acknowledging the existing gap in their State Action Plans on Climate Change.[10] The cumulated annual investment gap between 2021 and 2030 for six states[c] alone stands at INR 444.7 billion.[11] Nonetheless, most states face multiple

c The six states are Goa, Haryana, Himachal Pradesh, Kerala, Odisha, and Tamil Nadu. The study initially chose nine states (which included Gujarat, Rajasthan, and Karnataka) based on the most updated State Action Plans for Climate Change (SAPCCs) for 2023. However, Gujarat, Rajasthan, and Karnataka were removed from the adaptation financing estimation due to the unavailability of estimated investment needs or proposed budgets for climate actions in the SAPCCs for Gujarat and Rajasthan and a lack of delineation of adaptation and mitigation interventions for Karnataka.

challenges in securing the necessary adaptation finance. The economic deceleration in 2020-21 and the substantial diversion of resources due to the COVID-19 pandemic constrained states' capacity to allocate funds towards climate adaptation. Furthermore, states encounter borrowing limitations due to new fiscal regulations, as off-budget borrowings are also considered for deciding on their net borrowing ceiling. As a result of reduced borrowing bandwidth, and in an attempt to bring about fiscal discipline, states face the pressure of alleviating existing debt burdens, further restricting their ability to bridge the adaptation funding gap.[12]

India is yet to develop a unified framework across states and union territories for climate risk assessment or a systematic methodology to appraise the extent to which its development programs address climate risk and vulnerability. Despite these systemic challenges, the increasing impetus for climate adaptation action has resulted in plans, policies, institutions, and schemes at both national (e.g., promotion of millets, a low water-consuming crop, as a mechanism for climate-resilient agriculture) and state levels (e.g., coastal adaptation in Odisha). However, there is considerable variation across states regarding the progress and emphasis of policies and schemes related to climate adaptation.

Adaptation Financing Pathways

The articles in this compendium have listed a few financing pathways that need to be charted towards greater flows of adaptation finance to the Global South. The importance of adaptation financing has also been highlighted in the G20 New Delhi Leaders' Declaration[13] and reiterated in the Think20 India Communique,[14] focusing on the G20's role in assisting project development facilities for sub-national governments across the Global South nations. The double troika of Global South nations assuming the G20 presidency—i.e., Indonesia, India, Brazil, and South Africa—holds significant potential in prioritising adaptation finance, especially for the developing and the underdeveloped world. The following paragraphs outline some of the most critical issues that need to be considered.

Making a Business Case of Adaptation

Various chapters in this volume have discussed the need for attracting private finance for adaptation. To incentivise the private sector, one needs to make a business case for adaptation, which will require institutional, instrumental, and fiscal interventions

to equate the social rate of return with the economic rate of return. On the other hand, businesses globally realise that leveraging the social rate of return can drive positive environmental outcomes, promote sustainable development, and create value for investors, communities, and ecosystems. Adaptation financing can be viewed through the lens of Porter and Kramer's concept of Creating Shared Value (CSV), which focuses on a domain of convergence for business and society towards generating economic value for both. Being of a public-goods nature, with the benefits of "non-excludability" and "non-rivalry", such schemes will be of value to both business and society, helping in corporate branding and creating a sustainable bottom-line framework.

Bolstering Blended Finance

Blended finance needs to be encouraged with the intention of blending private capital with public finance as well as merging climate finance with disaster management finance and encouraging nature-based solutions. Certain nature-based solutions like coastal ecosystem regeneration can help both adaptation and mitigation processes.[15]

Boosting South-South Cooperation Towards Adaptation Financing

Lower resilience to climate change in terms of assets and physical capital, and relative lack of means to put green transition into effect necessitates adaptation financing for Global South nations. South-South cooperation, being based on common experiences and mutual respect, can help address the unique challenges of the developing and underdeveloped world which are aggravated by climate change, such as food insecurity, poverty, and health outcomes. As highlighted by the successive G20 presidencies of the four Global South nations from 2021 to 2025, South-South cooperation nurtures mutually beneficial alliances, enhancing the role of the Least Developed Countries (LDCs) and Small Island Developing States (SIDs) in global development governance. The United Nations Office for South-South Cooperation (UNOSSC) envisions these partnerships as providing new development finance sources, including concessional loans and untied grants. The UN-sponsored SDG Fund also aims to transform knowledge production, policy design, and funding acquisition, with a focus on climate adaptation financing. Similar efforts should be initiated at bilateral and trilateral levels.

North-South Partnerships for Adaptation Financing

North-South partnerships should be forged on mutual terms and an equal footing through various cooperation models hinged on a fair division of responsibilities. This will require rectifying the unjust and exploitative nature of development relationships to ensure that development efforts meet the preferences and needs of lower-income countries. This will also require reforms of existing multilateral financing institutions like the IMF and the World Bank, whose majority shareholders are from the Global North. They also exhibit a lopsided financing portfolio that fits the mitigation project targets of the Global North, resulting in the secondary treatment of adaptation in the Global South. In certain cases, however, trilateral partnerships have provided unique solutions to the problems of the Global South,[16] and the same framework can be replicated in adaptation financing.

A Climate Adaptation Taxonomy Suitable for the Global South

The existing taxonomies for adaptation are often inadequate, especially for the Global South. Further, in many cases, the difference between development funding and adaptation financing is blurred. Therefore, there is a need to identify adaptation projects in the taxonomy so that fiscal incentives can be developed to attract adaptation financing.

Philanthropy as Development and Adaptation Finance

According to the Global Wealth Report 2023, the total net private wealth of the world was US$454.4 trillion at the end of 2022.[17] This number is slated to increase by 38 percent to reach US$629 trillion by 2027. Apportioning and mobilising less than 1 percent of this global wealth will be sufficient to bridge the annual Sustainable Development Goals (SDG) financing gap (as of 2023, US$4.5 trillion[18] annually) till 2030. The adaptation financing gap can also be bridged from this financing source, as climate adaptation is subsumed under SDG 13. Therefore, philanthropy can help mobilise components of global wealth to meet unmet developmental finance goals. The G20 and other blocs need to create enabling conditions towards mobilising philanthropic funds towards adaptation financing.

A G20 Development Financial Institution

The failure of existing institutions to cater to the development and adaptation needs of the Global South necessitates the formulation of a Development Financial Institution (DFI) at the G20 level.[19] The mandate of such an institution will be to support the Global South by bridging the SDG financing gaps and revitalising the global economy during times of crisis. More importantly, the DFI will fund projects by looking at long-term social returns rather than short-term economic returns. Similarly, a G20 DFI can mobilise resources for financing loss and damage, the setting up of which has been a highlight of COP27 to support the vulnerable communities of the Global South.

The Role of Corporate Social Responsibility

To ensure private sector engagement, governments often earmark a percentage of private-sector profit for Corporate Social Responsibility (CSR). For instance, in India, businesses are obligated to spend at least 2 percent of their average net profit from the preceding three years on CSR activities.[20] To mobilise this engagement towards development and adaptation needs, governments could stipulate that a specified percentage (ranging between 35 percent and 50 percent) of the total CSR expenditure be directed towards the SDGs. Within this allocation, a significant proportion (e.g., 25 percent) could be earmarked for adaptation financing. This will ensure a dedicated CSR amount for adaptation and boost financing for the purpose.

Innovative Financial Instruments

A number of financial instruments have been used for the mobilisation of adaptation funds.[21] Green bonds, sustainability bonds, sustainability-linked bonds, blue bonds, and social bonds have been used to enable access to financial resources from financial institutions, private investors, institutional investors, impact investors, businesses, and other philanthropists, which could allow blending with traditional sources of financing. Innovations like the water index futures have been implemented in the United States (US) and Australia to help the farming community adapt to the water availability risk. Such models need to be adapted for adoption in the Global South.

To end…

Creating conditions for equating social and economic rates of return requires increased collaboration and coordination between different actors, including governments, private sector investors, and local communities. This will require fiscal incentives, statutes, innovative instruments, and smoother operating conditions for financial institutions and private players to enable them to play an active role in adaptation funding.

Returning to the metaphors from *Lady Windermere's Fan*, equating the two rates of return can help circumvent the ideological conflict between the 'cynic'—who only believes in the short-term economic returns decided by the markets but is oblivious of the long-term social concerns—and the 'sentimentalist'—who only sees the long-term social returns without being concerned about the market forces and business priorities.

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