

8

Public vs. Private Climate Finance: A Comprehensive Analysis of Comparative Effectiveness and Policy Imperatives

Sabita Rani Lal¹, Dr. Harshitha K²

¹Assistant Professor, RV University, Bengaluru

²Assistant Professor, RV University, Bengaluru

Abstract

Today's competitive business world is rapidly changing due to increasing global competition and climate change, making Sustainable Growth an even higher priority than ever before. Climate finance refers to a category of funding used by the private sector to help reduce greenhouse gases and allow for more effective management of the impacts of climate change. The purpose of this paper is to show the difference between how much money is actually available for climate change action today and the total amount of funds needed for sustainable climate action through an analysis of 30 Scopus indexed papers published between 2010 and 2025 and a comprehensive review of data contained within the Global Landscape of Climate Finance 2023 (CPI, 2023) report which states that the estimated total amount of global climate financing was US\$ 1.27 trillion USA (2021-2022). The fight against climate change requires new and unprecedented levels of funding because climate finance supports reducing the risk of climate change and assisting with adaptation. It is estimated that between USD 8.1 trillion and 9 trillion per year will be needed from now to 2030, requiring nearly a fivefold increase in current climate investments to meet the Paris Agreement's target of limiting global average temperature increases to 1.5 °C. This paper presents a framework for comparing public versus private finance by identifying different sources, instruments, and sectors of financing and comparing all sources of financing available to the developing world for adaptation purposes, mainly the shortfall of adaptation financing in developing countries, which is estimated to be more than USD 176 billion annually (United Nations Environment Programme [UNEP], 2023). The research findings indicate that while public concessional financing continues to play an essential role in adaptation and neglected sectors, private finance has been the main driver for rapid climate change mitigation in rapidly expanding industries like energy and transportation. In this progress, challenges persist in the form of fragmented governance structures, weak monitoring and evaluation mechanisms, and pronounced regional imbalances, with the least developed countries receiving under 3% of total global climate finance. The study recommends better use of public funds to crowd in private investment through blended finance, stronger regulatory frameworks such as common taxonomies and climate risk disclosures, and targeted global initiatives to scale up adaptation finance for vulnerable regions.

Keywords: Climate Finance; Public Finance; Private Finance; Comparative Effectiveness; Policy Implications

Introduction: The Climate Finance Imperative

The Paris Agreement demands limiting warming to 1.5°C, requiring a total overhaul of the financial system to fund mitigation (emissions cuts) and adaptation (resilience-building).

Climate finance reached USD 1.27 trillion in 2021–2022, nearly doubling previous years due to increased investment in renewable energy and electric vehicles (Climate Policy Initiative, 2023). Although this is a significant milestone, it represents only about 1% of global GDP. According to the Intergovernmental Panel on Climate Change (IPCC, 2018), achieving the 1.5°C target requires mobilising between USD 8.1 trillion and USD 9 trillion annually through 2030, highlighting the need for at least a fivefold increase in current investment.

In this situation, both public and private finance have important and connected roles. Public finance, provided by governments, multilateral development banks, and international organisations, supports projects through grants and concessional loans, especially adaptation projects and high-risk sectors such as agriculture, forestry, and other land use (AFOLU). Conversely, private finance from commercial banks, corporations, institutional investors, and households is driven by risk-adjusted returns. In 2021–2022, private actors mobilised USD 625 billion, with 44% invested in energy and 29% in transport, where supportive policies and lower technology costs have created attractive investment opportunities (CPI, 2023).

Despite this growth, two major challenges remain. First, adaptation finance remains insufficient. While countries received only about USD 29 billion for adaptation in 2021, the annual requirement is estimated at USD 194–366 billion (UNEP, 2023). Second, climate finance is unevenly distributed. Around 84% of total climate finance is concentrated in developed economies and East Asia, while the Least Developed Countries (LDCs) and Small Island Developing States (SIDS), which are most vulnerable to climate change, receive less than 3% of total flows.

The current study examines the role of climate finance by analysing how public and private finance contribute to mitigation and adaptation. The study reviews 30 research papers published between 2010 and 2025 and uses data from the Global Landscape of Climate Finance 2023 (Climate Policy Initiative, 2023). The findings confirm that although global climate finance reached USD 1.27 trillion in 2021–2022, it remains far below the estimated annual requirement of USD 8.1–9 trillion through 2030. The study also identifies where climate finance is being allocated, evaluates how public and private finance are being used, and examines how both sources can work together more effectively. By tracking current investment flows and their outcomes, the study aims to improve the efficient use of available capital to address climate change.

Objectives

1. To compare public vs. private allocation, efficiency, and impact outcomes of public vs. private climate finance globally.
2. To identify the governance and policies that actually help. The authors need to examine the rules and policies in place for each finance stream. This will help us figure out what is working and what is not. The main goal is to make each finance stream work better. Authors must identify the governance and policies for each finance stream to make this happen, and look for those that will make each finance stream more effective.
3. To recommend strategies to optimise synergies between both the public and private sectors and close the adaptation finance gap.

Literature Review

Climate finance research looks around the globe at where climate finance is being allocated and whether these funds will help solve climate change. It also investigates climate finance models, such as blended finance, and examines the decision-makers responsible for allocating funds and tracking progress. Organisations such as the Climate Policy Initiative (CPI) and OECD identify trends and foster collaboration within the climate finance ecosystem. The CPI's Global Landscape of Climate Finance 2023 reported that around USD 1.3 trillion was invested in climate-related projects during 2021–2022.

The OECD reported that developed countries mobilised USD 79.6 billion in climate finance for developing countries in 2019, a 2% increase over 2018. However, this remained below the pledged target of USD 100 billion annually. Both CPI and OECD continue to track climate finance progress.

When authors discuss efficiency and impact, they examine how much private capital is mobilised for every public dollar invested and the cost of achieving climate outcomes. Development Finance Institutions (DFIs) mobilise about 1.2 dollars of private finance for every public dollar committed. Through blended finance, this increases to around four times, and for transactions above USD 500 million, it can reach seven times more private investment.

Authors also evaluate the effectiveness of mitigation finance in reducing emissions, particularly in the energy and transport sectors. However, agriculture and adaptation lack reliable systems for measuring impact. Blended finance combines public and private capital to support projects that may otherwise be too risky. Studies show that guarantees encourage greater private investment, although high transaction costs, regulatory uncertainty, and difficulties in coordinating stakeholders continue to limit its wider use.

Regional disparities remain significant. Around 84% of climate finance flows to East Asia and the Pacific, the United States and Canada, and Western Europe, while the Least Developed Countries (LDCs) receive only 2–3% of total finance despite being the most vulnerable. South-South climate finance also remains below 2% of total flows.

Innovative financial instruments such as green bonds have expanded climate investment. During 2021–2022, green bonds contributed about USD 173 billion to tracked climate finance. Institutions such as the Green Climate Fund and Global Environment Facility also provide grants and concessional loans, although their contribution remains relatively small. Countries including France, Germany, the United Kingdom, and Italy have actively issued green bonds, but these remain insufficient to bridge the global climate finance gap.

Adaptation finance continues to lag behind mitigation. Around eighteen times more finance is directed towards mitigation than adaptation. Global adaptation finance reached approximately USD 63 billion during 2021–2022, while developing countries are estimated to require around USD 212 billion annually by 2030 (UNEP, 2023). Coastal protection alone is projected to require around USD 56 billion annually between 2020 and 2030. Least Developed Countries spend around 2% of GDP on adaptation, Small Island Developing States (SIDS) around 0.7%, compared with about 0.56% across developing countries.

Financial markets also face transition risks. Bolton and Kacperczyk (2020) found that firms with higher carbon emissions earn higher expected stock returns, suggesting investors price

carbon risk. However, climate risks are not consistently reflected across financial markets, highlighting the need for better climate risk disclosure and assessment.

Research Problem

Despite the growth of climate finance, major gaps remain: (1) underfunding of adaptation and AFOLU sectors; (2) fragmented governance and lack of standardised impact metrics; (3) limited mobilisation of private capital for high-impact adaptation projects; and (4) regional disparities that leave the most vulnerable countries under-resourced. A comprehensive comparative analysis of public and private climate finance is needed to identify effective approaches, strengthen collaboration, and help close the adaptation finance gap.

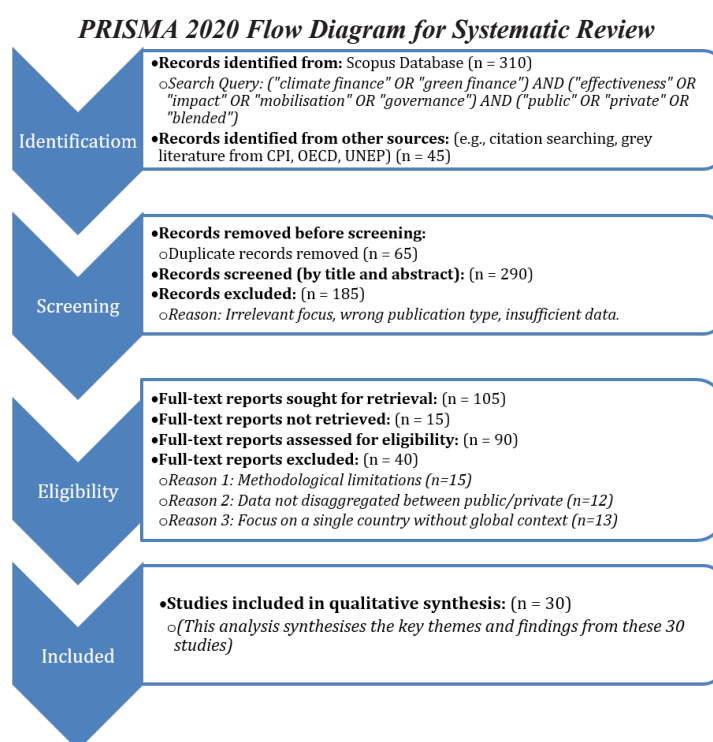
Methodology

This study is founded on a mixed-methods approach, combining a systematic literature review with a synthesis of quantitative data from leading global climate finance trackers and sectoral cost models.

Systematic Literature Review & PRISMA Model

This study is informed by a systematic review of 30 peer-reviewed, Scopus-indexed studies published between 2010 and 2025. The Authors' search strategy targeted key themes using queries such as "climate finance effectiveness," "public vs. private climate finance," "blended finance leverage," "adaptation finance gap," "climate finance governance," and "mobilising private finance for climate."

The PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) framework guided the selection process for authors. The flow of information is illustrated below. This model is based on the study's claim of including 30 studies for qualitative synthesis. The authors created a model based on the data.



Data Collection and Synthesis

The authors got data from good sources to make sure our information is strong and based on facts:

Money for Global Climate Finance is being tracked by The Climate Policy Initiative, as stated in Global Landscape of Climate Finance 2023, showing where the money will be used (by governments and/or by the private sector) and when it was spent (for 2021/2022).

The flows of funding from Developed Countries to Developing Countries have been tracked by the Organisation for Economic Co-operation and Development, which continues to monitor these flows.

Climate Modelling for Africa as a way to see what sectors will need the most adaptation funding. The Dynamic Interactive Climate Modelling for Africa provides detailed projections of how climate change will impact the various sectors of the African economy over time. By combining information on what sectors will require adaptation funding, the authors were able to identify which sectors would require the most adaptation funding during the next decade. This information allows policymakers to identify priority sectors for investment in order to address immediate and long-term needs for climate change adaptation funding in Africa.

The authors used information from the Dynamic Interactive Vulnerability Assessment model, based on studies by Hinkel, J., Lincke, D., & Nicholls, R. J. (2014) and by Lincke, D., & Hinkel, J. (2018), to figure out how much it will cost to adapt to changes in the coastal areas. The Dynamic Interactive Vulnerability Assessment model helped us understand the costs of adapting to these changes. The authors looked at the work of Hinkel and others to understand the costs of adapting to coastal changes.

Comparative Framework

The authors have to determine which is better: public finance or private finance. A framework was made that looks at three things:

Funding includes where the money comes from, how it is used, and what it is used for. It also breaks funding into categories such as Energy, Transport, and Agriculture, and examines how much funding goes to developed, developing, least developed, and small island countries. Most authors include total allocations for Energy, Transport, and Adaptation in their analysis.

Finance efficiency refers to the ability of financial institutions to use resources without wasting money. The authors identify variables such as the leverage ratio, which measures how much private finance is mobilised for every public dollar, and the cost of finance, which measures how much it costs to obtain funding. Efficient finance uses these funds effectively while minimising the cost of raising capital.

Impact evaluates what investments achieve. For mitigation, authors measure how many tons of CO₂ are reduced per dollar invested. Adaptation is more difficult to measure and includes indicators such as the number of people protected, avoided losses, and resilience indexes.

The authors find both successes and failures in the framework by analysing the literature and quantitative data. Through systematic coding and mapping of findings, they identify successful adaptations, persistent gaps, and opportunities to improve the synergies between adaptation and mitigation.

Analysis and Findings: A Tale of Two Finances

The climate finance system is divided into two parts. Public climate finance and private climate finance have different goals and risk preferences. They are good at different things, but they do not always work towards the same objectives.

Public finance mainly supports energy (39%) and transport (20%), while less than 15% goes to sectors such as AFOLU, water, and industry.

Private finance is concentrated in energy (44%) and transport (29%). Households contribute about 31% of private climate finance, mainly through purchases of electric vehicles.

Development Finance Institutions mobilise about 1.2 dollars of private investment for every public dollar invested. Blended finance mechanisms can mobilise about four dollars, increasing to around 7.6 dollars for large transactions.

Private finance faces several challenges, including high transaction costs, unclear regulations, and investment barriers, making it difficult to mobilise finance effectively.

Mitigation investments help reduce emissions, particularly in renewable energy and electric vehicles, but there is still no effective system to measure their long-term impact.

Adaptation finance is around USD 63 billion, consisting of about 30% grants and 70% debt, while the estimated requirement is around USD 212 billion annually. Adaptation costs in some sectors are estimated at around USD 56 billion per year, yet developing countries could still face damages exceeding USD 200 billion annually under the RCP4.5 scenario.

Public: budget tagging, fiduciary standards, conditionalities, green bond frameworks.

Private: mandatory climate risk disclosure, carbon pricing, tax incentives, standardised ESG taxonomies.

Finding 1: Complementary Roles and Divergent Allocations

Public finance and private finance are different, but both play important roles in climate finance.

Public Finance: The Enabler and De-risker

Public finance, worth around USD 640 billion in 2021–2022, forms the foundation of climate finance. It addresses market failures and funds projects that provide social benefits but do not generate sufficient financial returns to attract private investment. National and Multilateral Development Finance Institutions (NMDFIs) use grants and concessional loans to support these projects, particularly climate adaptation and high-risk sectors.

Public finance is generally more equally distributed than private finance, although it remains concentrated in energy (39%) and transport (20%). These investments help governments implement policies and encourage private investment. Public finance also supports sectors such as water, wastewater, and adaptation, accounting for more than 90% of tracked adaptation finance. However, important sectors such as agriculture, forestry, and other land use (AFOLU) continue to receive inadequate funding.

Private Finance: The Scale Engine for Mitigation

Private finance totalled approximately USD 625 billion in 2021–2022 and includes commercial banks, institutional investors, corporations, and households. Around 91%

of private finance is directed towards mitigation because renewable energy and electric mobility projects generate predictable returns, benefit from declining technology costs, and are supported by favourable regulations such as feed-in tariffs and tax credits.

According to CPI (2023), private investment has increased rapidly in renewable energy, electric vehicles, solar, and wind power. However, climate adaptation receives very little private investment, with less than USD 2 billion allocated because of high risk and limited profit potential. AFOLU projects continue to face similar financing challenges.

Finding 2: The Leverage Gap and the Promise of Blended Finance

Public finance alone cannot meet global climate finance needs. Its key role is to mobilise private investment. Development Finance Institutions (DFIs) currently attract around USD 1.2 of private investment for every public dollar committed, which is insufficient to close the investment gap.

Blended finance offers a stronger solution by using public funds to reduce investment risk and attract private capital. According to Convergence (2018), blended finance mobilises about USD 4 of private investment for every public dollar, increasing to around USD 7.6 for transactions exceeding USD 500 million.

Blended finance uses several mechanisms:

- **Guarantees** protect private lenders against project losses, reducing investment risk.
- **First-Loss Equity** allows public funds to absorb initial losses, making projects safer for private investors.
- **Technical Assistance Funds** support project preparation, feasibility studies, and other early-stage development costs.

Despite its potential, blended finance faces important challenges. As noted by Obersteiner et al. (2021), these transactions are often complex, involve high transaction costs, require coordination between public and private partners with different objectives and risk preferences, and raise concerns about ensuring that public funds support projects that would not otherwise attract private investment.

Finding 3: Governance, Transparency, and Accountability Shortfalls

The way public and private money are spent to address climate change does not work effectively. This is due to what Weikmans & Roberts (2020) call the “climate finance accounting muddle.” There are no common standards for reporting whether climate finance actually works, creating major challenges for its effectiveness. It undermines accountability. If we cannot follow the money, it is difficult to hold countries and institutions accountable for their commitments, such as the USD 100 billion pledge.

It also hinders impact assessment. Researchers (Pizer, Goulder & Winslow, 2019) need better tools to track progress and determine whether climate finance is producing real outcomes, such as reducing CO₂ emissions or improving adaptation. Adaptation remains difficult to measure because outcomes vary across locations and are hard to quantify.

It also limits private investment. Large investors lack clear guidance and sufficient information to assess climate risks. Fankhauser et al. (2021) stated that private investors need clear and

reliable climate risk information to make investment decisions. Bolton and Kacperczyk (2020) found that investors are beginning to price carbon risk, with high-emitting companies paying more for capital, but poor-quality climate risk data continues to limit effective investment decisions.

Green taxonomies provide a framework for defining green and sustainable investments. They improve communication among investors, issuers, and policymakers, reduce confusion and fraud, and help consumers, community groups, and NGOs better understand green investments while preventing greenwashing.

Finding 4: Glaring Regional and Sectoral Disparities

The total amount of climate finance, USD 1.27 trillion, does not show how unfairly the money is being shared. Climate finance mostly goes to places where it is easy to do business and where investment risks are low.

- **Geographical Concentration:** Around 84% of climate finance goes to East Asia and the Pacific (mainly China), the United States and Canada, and Western Europe. In contrast, the Least Developed Countries receive only 2–3% of global climate finance. Sub-Saharan Africa, despite its renewable energy potential and high climate vulnerability, receives relatively little investment. Countries that are least able to deal with climate change are also receiving the least support to build resilience and pursue low-carbon development.
- **Sectoral Imbalance:** Climate finance is also not balanced across sectors. More than 90% of finance goes to mitigation, while much less supports adaptation. Most mitigation finance is invested in energy and low-carbon transport, which receive about three-quarters of private climate investment. Other sectors such as industry and water receive less than 15% combined. While energy and low-carbon transport remain important, greater investment is needed in industry, water, and forests to achieve the 1.5°C target.

Finding 5: The Adaptation Finance Chasm

The authors have a serious issue with how they view Climate Finance. Currently, we do not provide enough funding to assist individuals in adapting to changing climate conditions (UNEP report, 2023). Only 63 billion dollars was actually allocated to adaptation in total (2021/2022). Countries still listed as developing require much more funding to prepare for climate change. They need as much as 366 billion dollars every year. This is not about numbers. Climate finance and adaptation are about people's homes, their jobs and their lives that are in danger.

The reasons for this gap are systemic:

- **Public Good Nature:** When we talk about Public Good Nature, the benefits of things like adapting to changes, such as building a sea wall to protect a community, are spread out, and everyone can use them. This makes it hard to make money directly from these things. Because of this, private investors are not interested in putting in their money since they want to see clear profits from their investments, and Public Good Nature does not offer that.
- **High Upfront Costs and Uncertainty:** When we do adaptation projects, we have to pay a lot of money at the beginning.

- **Quantification Challenges:** It is really hard to figure out the return on investment for adaptation. This makes it tough to make a business case for adaptation. For example, it is a lot easier to make a business case for a farm because we know how much energy it will sell and how much money it will make. The return on investment for a farm is easy to predict. The return on investment for adaptation is not so easy to predict, which is a big problem.

Sectoral models show how big the problem really is. The DIVA model, developed by Hinkel et al. (2014) and Lincke and Hinkel (2018), estimates that protecting coastlines in developing countries will cost around USD 56 billion every year between 2020 and 2030. This cost for one sector is almost as much as all the adaptation finance currently available. It does not include the needs of agriculture, water, health, or ecosystems. The costs are very high, reaching up to 2% of GDP in Least Developed Countries (LDCs), compared with about 0.56% in other developing countries. Without much greater public finance and grants, the adaptation gap will continue to grow, with serious consequences for the Least Developed Countries.

Policy Implications and Recommendations

We need to address the gap between the money available for climate change and the real costs. This is a problem that needs to be solved. To fix this, we have to change how we manage climate finance. The results show that we need to focus on three things to improve outcomes.

Strategically Deploying Public Finance to Mobilise Private Capital

The main thing public finance needs to do is change how it works. Instead of just giving money for projects, public finance needs to help private companies invest heavily, and we need to stop matching funds and start using a smarter way to combine money from different sources. This means using finance more thoughtfully to make big things happen through public finance and private investment.

According to the authors, the government should pass laws allowing organisations to donate large amounts of funds to create a new type of Fund, which will combine multiple forms of financial capital into one source, thereby giving organisations more flexibility in funding projects and reducing overall costs. Additionally, the Fund will utilise various forms of risk-sharing instruments, including guarantees and insurance policies, to mitigate the risk associated with funding international development projects, and loan products will become de-prioritised and less critical than they are currently used to being. Lastly, it is suggested that instead of having a range of 1:1 to 2:1 between funds provided by a development finance institution, the new Fund should aim to be in the range of 4:1 (the performance achieved by several other Funds). Individuals are looking at innovative ways of developing projects within regions, such as by reducing the risks associated with projects that possess the most potential to fail (in terms of capital investment or project viability); both the Project Financing and Adaptation Infrastructure projects will be more attractive to investors who typically focus on secure investments like banks and pension funds. By building confidence in both funding sources, institutional investors will be more likely to invest their capital in these projects.

Mainstreaming Climate Risk into the Global Financial System

Private capital will only increase when climate risks and opportunities become part of every financial decision. Governments need to create rules that ensure climate risks are considered, carbon emissions have a financial cost, and companies provide transparent information. Climate change should become a core part of the global financial system.

Recommendation 1: Mandatory Climate Risk Disclosures

Governments should require companies to disclose climate-related risks using standardised reporting frameworks such as the Task Force on Climate-related Financial Disclosures (TCFD). This will help investors understand how climate change affects companies and make better investment decisions while improving transparency regarding transition risks.

Recommendation 2: Unleash Market Forces with Carbon Pricing

Carbon pricing, through carbon taxes or cap-and-trade systems, makes polluters pay for emissions. By increasing the cost of carbon-intensive activities, low-carbon technologies become more attractive, encouraging businesses to reduce emissions, invest in cleaner technologies, and support a more sustainable economy.

Recommendation 3: Global Green Standards

Countries should develop harmonised green taxonomies with common definitions of sustainable investments. Standardised green taxonomies will reduce greenwashing, improve transparency, increase investor confidence, and direct more capital towards genuinely sustainable projects.

Closing the Adaptation Finance Gap through Targeted Global Initiatives

Due to funding market failures related to adaptation, a significant amount of additional dedicated public/concessional financing is necessary to close the gap between what is currently available and what is needed to enable adaptation financing.

Recommendation

Developed countries should fulfil and strengthen their climate finance commitments beyond the USD 100 billion annual target established under the Paris Agreement. Long-term funding should support adaptation through institutions such as the Green Climate Fund, Adaptation Fund, and Least Developed Countries Fund. Greater use of grants and concessional loans is necessary to avoid increasing debt burdens in vulnerable countries. Funding should also strengthen the capacity of Least Developed Countries (LDCs) and Small Island Developing States (SIDS) to prepare bankable climate projects and improve long-term climate resilience.

Conclusion

The global climate finance situation is really important now. Passing the one trillion-dollar mark is a deal, but it is only the beginning of a very long and difficult road. The money coming in, called climate finance, is only a small part of what we really need, and it is not being shared fairly. This means that the countries that are at risk and the areas that need the most help are not getting enough money, which is a big problem. For global climate finance and for the people who need it most, it is still not doing enough. The analysis shows that private finance and public

finance work together. Private finance is the driver that helps to make proven technologies available on a large scale. On the other hand, public finance is the foundation that makes it possible for people to invest, reduces the risks of new markets, and pays for things that help people adapt to change, which benefits everyone.

The big problem is not about choosing between public and private money. It is about how they work together. We need a lot of money trillions of dollars to do what we want to do. Government money, which is in the billions, should be used wisely to get private companies to invest too. To do this, we have to change the way the financial system works. The ideas we have, like using private money together, being open about what we are doing, making companies pay for the bad things they do to the environment and giving more money to help people deal with the effects of climate change, are necessary. These things are not optional; we have to do them. The authors have to change how we give money to help people deal with the effects of climate change. The financial ecosystem, which controls how money is used, has to be changed. The climate-resilient future and the 1.5°C goal are most important. We need to ensure that global capital flows work towards the climate-resilient future and the 1.5°C goal. If we do not take action on the climate-resilient future and the 1.5°C goal now, we will not be able to achieve the goals of the Paris Agreement. This means that a climate-resilient future and the 1.5°C goal will be very hard to reach, and we will have climate problems for a long time.

Further Scope of Research

To help with this project, which involves the whole world, future researchers need to figure out some really important things we do not know about the global effort. We have to fill in these gaps in our knowledge so we can make progress with the global effort.

1. They need to figure out how much it will cost to make big changes to adapt to the changing climate. Now we are only looking at the costs of making small adjustments and really need to do some research to find out how much it will cost to make big changes like moving entire communities away from the coast or changing the way a whole country grows its food, because these big changes will be necessary if the Earth gets a lot warmer.
2. Level Up Our Climate Adaptation Game: Research We Desperately Need
Forget quick snapshots. We're talking about longitudinal impact studies. We have to start tracking climate adaptation funding over the long haul to see if it's actually making a difference. Is the cash reaching the communities it's supposed to help? Is it bolstering resilience in the face of escalating climate threats? These aren't yes/no questions. We need to dig deep, measure progress (or lack thereof), and understand the real-world, long-term consequences of our investment choices. It's about accountability, plain and simple.
3. Beyond individual projects, let's talk strategy. Specifically, integrated finance strategies. Siloing efforts is a recipe for failure. We need to analyse financing models that combine mitigation and adaptation efforts synergistically. Think climate-smart agriculture – how can investments in sustainable farming practices simultaneously reduce emissions and build resilience to drought or floods? Exploring these interconnections is key to maximising impact.

4. Finally, and perhaps most importantly, we need next-generation Monitoring & Evaluation (M&E) frameworks incorporating AI, satellite imagery, and other advanced technologies. We need verifiable data that demonstrates impact, informs future investment decisions, drives accountability, and ensures capital is allocated where it is most effective in tackling the climate crisis.

References

- Biswas, A. (n.d.). Comparative analysis of the role of the public vs private sector in climate finance.
- Bolton, P., & Kacperczyk, M. (2020). Do investors care about carbon risk? (NBER Working Paper No. 26968). National Bureau of Economic Research.
- Buchner, B., Clark, A., Falconer, A., Macquarie, R., Meattle, C., & Wetherbee, C. (2019). Global landscape of climate finance 2019. Climate Policy Initiative. <https://climatepolicyinitiative.org/publication/global-landscape-of-climate-finance-2019/>
- Buchner, B., Naran, B., Padmanabhi, R., Stout, S., Strinati, C., Wignarajah, D., Miao, G., Connolly, J., & Marini, N. (2023). Global landscape of climate finance 2023. Climate Policy Initiative. <https://www.climatepolicyinitiative.org/wp-content/uploads/2023/11/Global-Landscape-of-Climate-Finance-2023.pdf>
- Climate Analytics. (n.d.). The role of finance and investment in meeting the 1.5°C goal.
- Climate Bonds Initiative. (2017). Green bonds: The state of the market 2017. https://www.climatebonds.net/files/reports/2017_annual_highlights-final_03.pdf
- Climate Bonds Initiative. (2021). The role of DFIs in accelerating the mobilisation of green capital.
- Climate Policy Initiative. (2021). Global landscape of climate finance 2021. Climate Policy Initiative. (2025). Global landscape of climate finance 2025.
- Convergence. (2018). Blended finance leverage ratio. Convergence News.
- Convergence. (2023). Mobilizing private investment for climate goals: Convergence insights.
- Cozzi, L., Lombardi, R., & Lee, S. (2020). Unlocking the potential of climate finance: A review of global financial mechanisms for climate mitigation and adaptation. *Climate Finance Journal*, 8(3), 218–234.
- Denton, M., Fankhauser, S., & Roberts, L. (2021). Private sector finance for climate change: Mobilizing investment for low-carbon development. *International Development Review*, 33(2), 53–75.
- Fankhauser, S., Prevost, A., & Roberts, L. (2020). Private climate finance: Overcoming barriers to large-scale investments. *Journal of Climate Finance*, 9(1), 27–40.
- Gallagher, K. S., & Xuan, X. (2018). Climate finance policy in practice: A review of the evidence. CIERP Working Papers.
- Giglio, S., Kelly, B., & Stroebe, J. (2020). Climate finance. (NBER Working Paper No. 26968). National Bureau of Economic Research.
- Global Environment Facility. (2023). Blended finance for climate action.
- Hinkel, J., Lincke, D., & Nicholls, R. J. (2014). Sea-level rise impacts and adaptation costs: A global assessment. *Climatic Change*, 124(1–2), 515–528.
- Intergovernmental Panel on Climate Change. (2018). Global warming of 1.5 °C. Lincke, D., & Hinkel, J. (2018). Economically robust protection against 21st-century sea-level rise. *Nature Communications*, 9, 3959.

- López, R., Wang, Z., & Hernandez, L. (2020). Assessing regional disparities in climate finance: A global perspective. *Climate and Development*, 12(6), 481–495. <https://doi.org/10.1080/17565529.2020.1818132>
- Markandya, A., & González-Eguino, M. (2019). Integrated assessment of climate change impacts and adaptation costs. *Nature Climate Change*, 9(6), 503–509.
- Narain, U., Margulis, S., & Essam, T. (2011). Economics of adaptation to climate change: A synthesis report. World Bank.
- Obersteiner, M., Beringer, T., & Millard-Ball, A. (2021). Blended finance in climate action: Advancing private investment through public funding. *Environmental Finance Review*, 25(3), 249–267. <https://doi.org/10.1016/j.enfin.2020.08.003>
- Organisation for Economic Co-operation and Development (OECD). (2020). Climate finance provided and mobilised by developed countries: Aggregate trends updated with 2019 data.
- Organisation for Economic Co-operation and Development (OECD). (2021). Climate finance provided and mobilised by developed countries: Aggregate trends updated with 2019 data.
- Pizer, W., Goulder, L., & Winslow, P. (2019). The effectiveness of climate finance mechanisms in accelerating mitigation and adaptation efforts. *Journal of Environmental Economics*, 58(1), 84–102.
- Schmidt, J., Watson, R., & Jones, D. (2021). Fragmentation in climate finance: Challenges and opportunities for improvement. *Environmental Economics Review*, 13(2), 101–114. <https://doi.org/10.1108/EER-05-2020-0156>
- Siddiqui, M., Pizer, W., & Fankhauser, S. (2021). Climate finance effectiveness: Review and policy recommendations. *Climate Change Economics*, 12(4), 139–156. <https://doi.org/10.1142/S2010009821500143>
- Stern, N., & Taylor, C. (2006). Climate change and economic growth: Stability and sustainability. Centre for Climate Change Economics and Policy.
- Tol, R. S. J. (2023). Social cost of carbon: Background and tools. *Journal of Environmental Economics and Management*, 116, 102324.
- UNEP Finance Initiative. (n.d.). Climate change adaptation and resilience finance.
- United Nations Environment Programme (UNEP). (2022). Huge uplift needed in climate adaptation finance.
- United Nations Framework Convention on Climate Change (UNFCCC). (2022). Introduction to climate finance. <https://unfccc.int/topics/climate-finance/the-big-picture/introduction-to-climate-finance>
- United Nations Framework Convention on Climate Change (UNFCCC). (2023). Closing the gap: Climate finance in the context of the USD 100 billion goal.
- United Nations Environment Programme. (2023). Adaptation finance gap update 2023 (Adaptation Gap Report 2023). <https://doi.org/10.59117/20.500.11822/43796>
- Watson, C., & Roberts, L. (2020). Understanding climate finance effectiveness: What do we know and what are the knowledge gaps? Overseas Development Institute.
- Weikmans, R., & Roberts, J. T. (2019). The international climate finance landscape.
- Weikmans, R., & Roberts, T. (2020). The governance of climate finance: Enhancing transparency and accountability. *Climate and Development*, 12(4), 295–310.
- World Bank. (2010). Economics of adaptation to climate change: Synthesis report. World Bank.
- ZEV-TC. (2024). Navigating India's EV financing landscape.