ELEMENTS 02

Essential knowledge about GCF

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Investment Opportunities for the Green Climate Fund

GCF's role and impact within the climate finance ecosystem

Return on private sector investments

What is GCF's approach to investment?

Understand the eight results areas

Focus on top investment priorities

GREEN CLIMATE FUND

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Investment Opportunities for the Green Climate Fund

GCF's role and impact within the climate finance ecosystem

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Introduction

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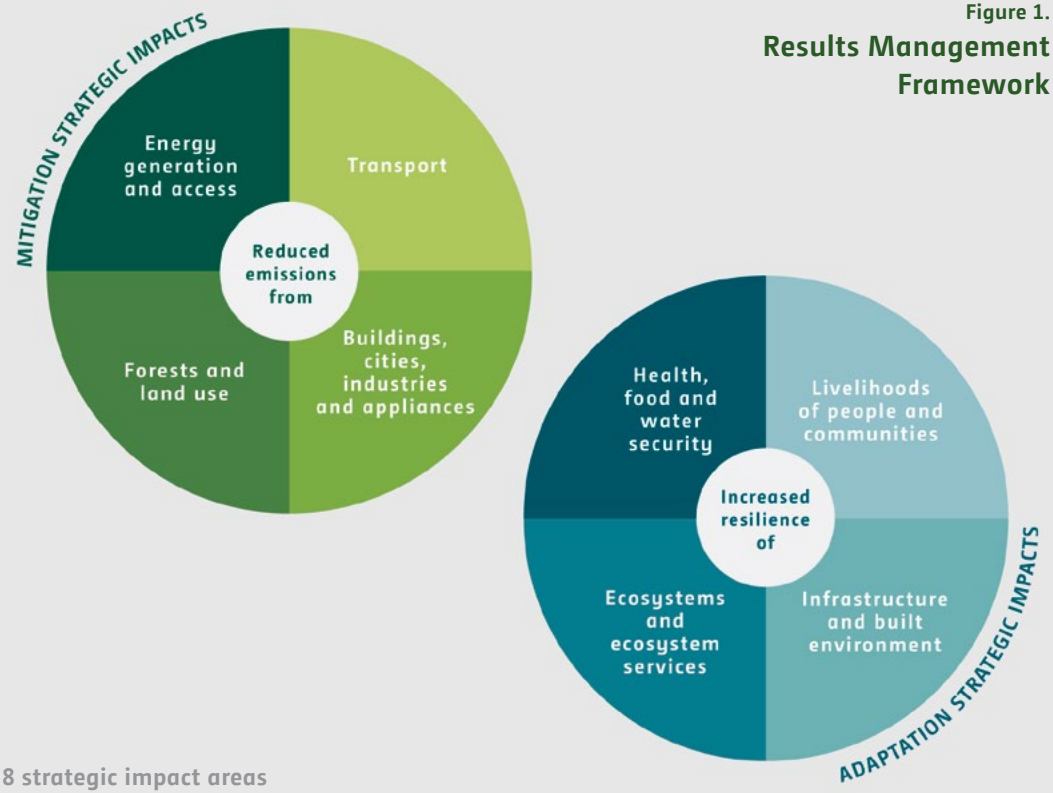
For this second edition of Elements, our series aimed at sharing essential knowledge about the Green Climate Fund – we are highlighting the key opportunities that the Fund can help countries seize. GCF has succeeded in raising approximately USD 10 billion equivalent during its initial resource mobilization in 2014. Utilizing the scarce resources to achieve the greatest possible impact on both mitigation and adaptation is now the key challenge faced by the Fund.

This guide considers the opportunities before the Fund, as well as the ongoing efforts of countries and other providers of climate finance. It highlights a number of areas where there is high potential to make a significant and ambitious contribution towards global efforts to combat climate change. This report draws on the findings of the document "Analysis of the Expected Role and Impact of the Green Climate Fund," presented at the 9th Board Meeting in March 2015, where readers can find in-depth discussion on each results area of the Fund based on up-to-date studies and data from a large number of sources. A list of key references is provided at the end of the document.

The Fund seeks to have an impact within eight mitigation and adaptation results areas identified by GCF's Board. The Fund is also committed to achieving a balance between its funding for mitigation and adaptation initiatives.

Figure 1.
Results Management Framework



8 strategic impact areas

A review of the potential for impact in these results areas suggests five cross-cutting investment priorities **(see Figure 2)**. These priorities are entry points for investment that can have an impact in multiple results areas, targeting both mitigation and adaptation in an integrated and holistic manner.

This guide explains the significance of the results areas and the opportunities presented in these five cross-cutting priority investment areas **(Figure 2)**. Alongside this, we also outline the Fund's approach towards the prioritization of investment opportunities.

The guide is intended to support efforts to identify priorities for engagement with the Fund and the development of potential projects and programmes for support from the Fund. National Designated Authorities (NDAs) and Focal Points of recipient countries and accredited implementing entities and intermediaries of the Fund are already beginning such efforts. We hope this report, and the underlying information on which it is based, can be a useful resource in these undertakings, and also provide useful insight to the wider community of GCF stakeholders.

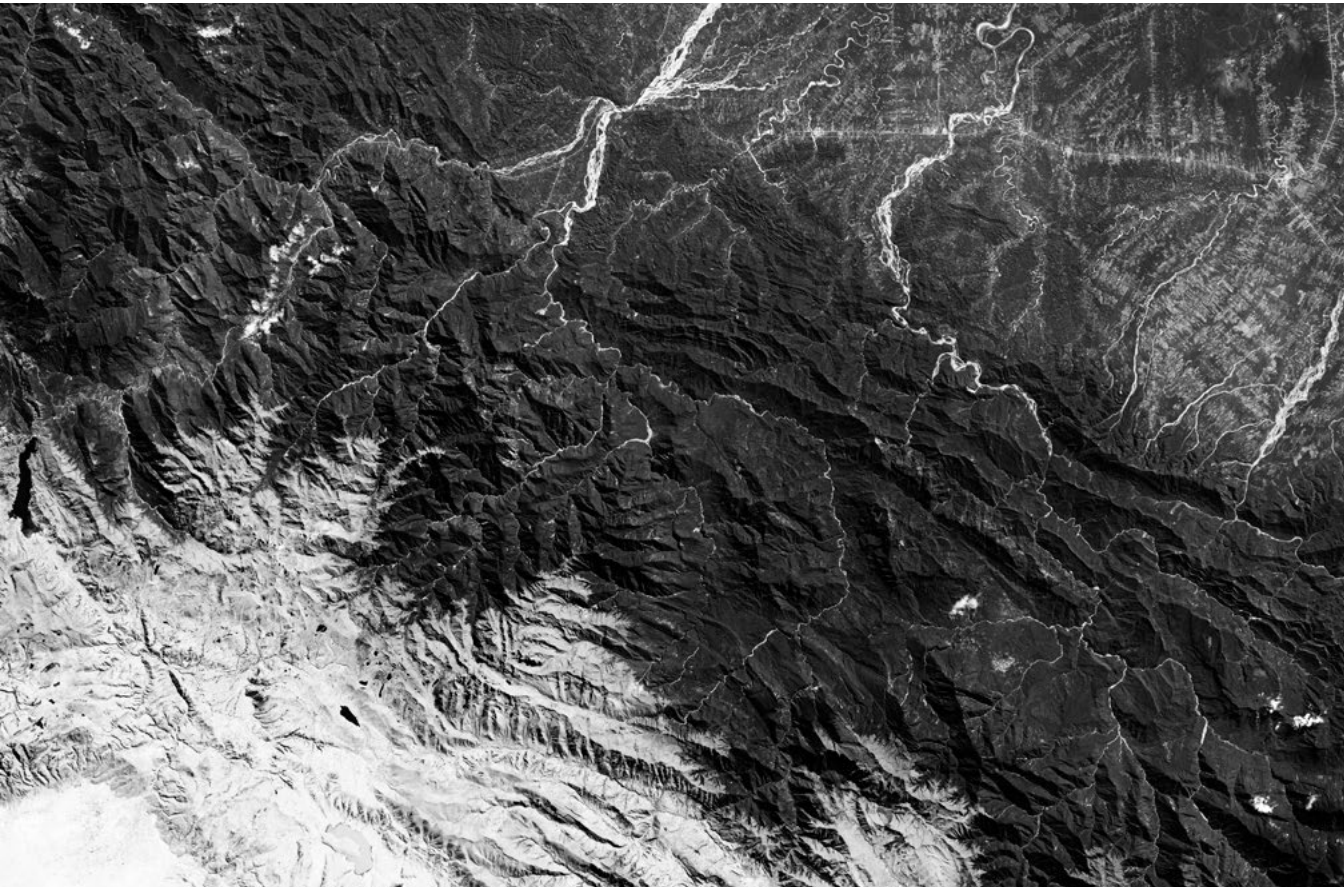
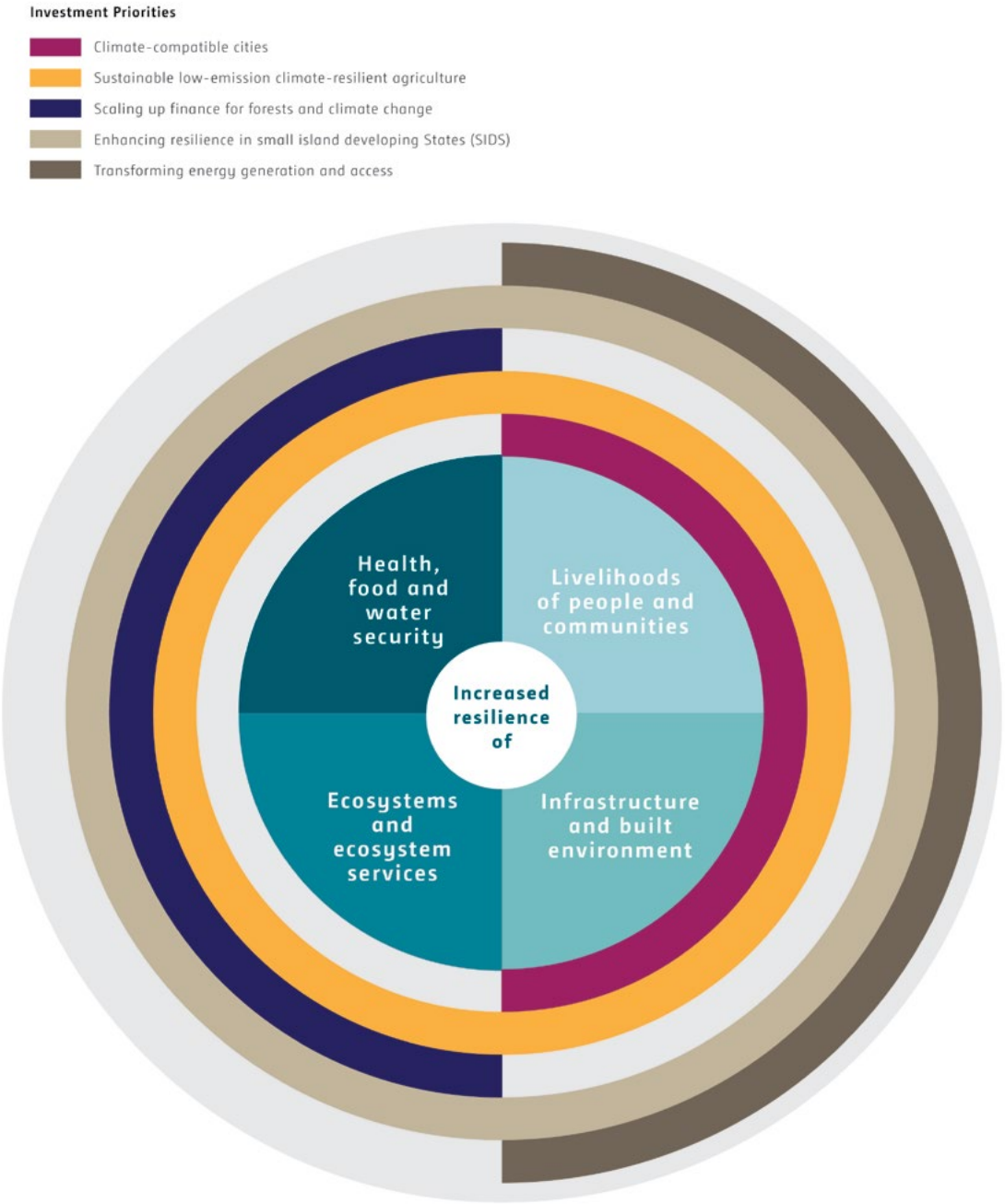


Figure 2.

Investment priority results area clusters


Investment Priorities
Climate-compatible cities
Sustainable low-emission climate-resilient agriculture
Scaling up finance for forests and climate change
Enhancing resilience in small island developing States (SIDS)
Transforming energy generation and access
Health, food and water security
Livelihoods of people and communities
Increased resilience of
Ecosystems and ecosystem services
Infrastructure and built environment

Part I: The Fund's Approach to Investment

01

The Fund must ensure that its investments drive a paradigm shift towards low emissions and climate resilience. It considers both mitigation and adaptation as critical parts of the response to climate change, with all eight results areas holding important potential, and will strive to achieve a balance in its portfolio. The goal of the Fund will be to seek the "sweet spots" between national priorities, potential to deliver concrete climate benefits, cost considerations, and opportunities to deliver co-benefits.

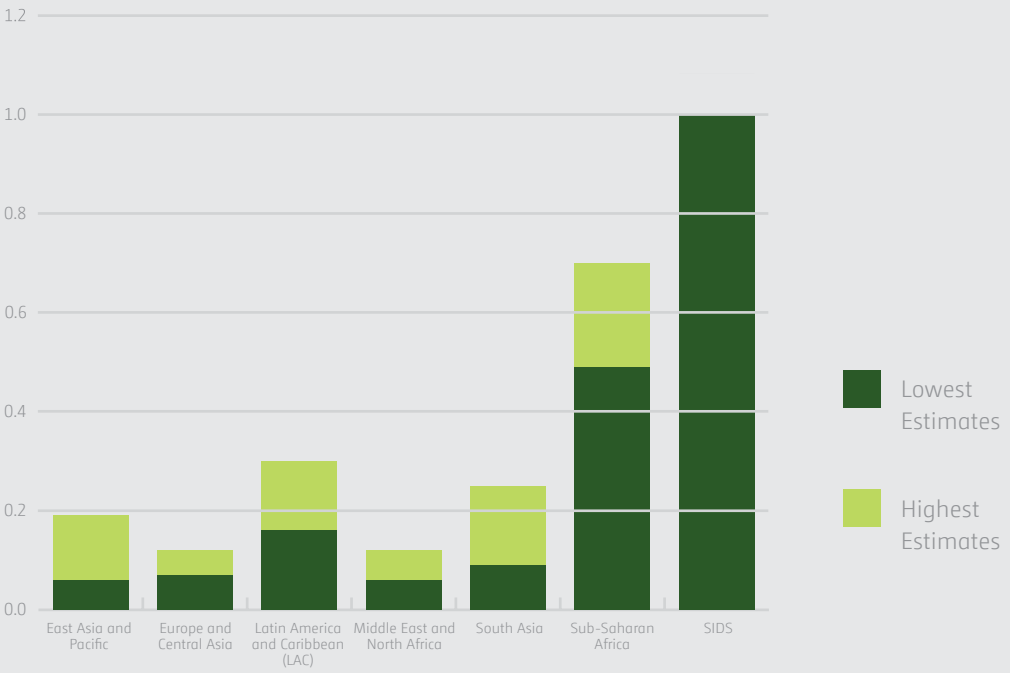
The Fund has a particular opportunity to differentiate itself from other climate finance channels by catalysing greater investment in adaptation, particularly from the private sector. The figures on climate finance flows **(Figures 5 & 6)** show that adaptation funding reaches less than 10% of the total dedicated to mitigation efforts. Adaptation costs, however, are projected to have a significant – and often underestimated - impact on gross domestic product (GDP) output.

Studies suggest that the costs of adaptation as a share of their GDP will be the highest for countries in Sub-Saharan Africa and small island developing states (SIDS) **(Figure 3)**.

These countries are highly vulnerable and affected by adverse climate events. Climate change is projected to cost SIDS 1% of their GDP, five times higher than the average. Africa, with one-seventh of the world's population, is poised to bear nearly 50% of estimated global adaptation costs in health, water supply, and agriculture and forestry **(Figure 4)**. Loss of life and reduction in GDP are also likely to be the highest for Least Developed Countries (LDCs) and SIDS. The poorest people, and poorest countries, are likely to be the most affected by the impacts of climate change.

Figure 3.

Annual adaptation costs as a percentage of GDP 2010-50 by region



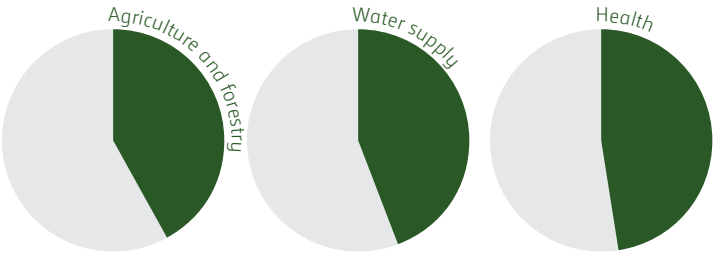


Figure 4.
% of global adaptation cost in Africa

The role of private investment is another area where the Fund's approach will be differentiated. The Fund is determined to partner with the private sector and harness its implementation capacity, to catalyse investment in the results areas and maximize the impact of the Fund's own investments. At points throughout this guide we outline the specific challenges and opportunities faced in the mobilization of private sector investment, in both mitigation and adaptation activities, and highlight the role of the Private Sector Facility in this regard.

The Private Sector Facility

The Fund's USD 10 billion of mobilized resources is very small in comparison to the USD 200 trillion in financial assets that we seek to shift towards low-emission and climate-resilient development. The Fund wants to harness the existing global financial architecture to make this possible, and has set up its Private Sector Facility (PSF) to take on this challenge. The PSF seeks to help scale up investment in low-emission development and unlock private sector investments in adaptation, responding to different country financial contexts and availability of capital.

The PSF can support mitigation by finding innovative ways to scale up increased supply of clean energy. These could include using funds to "de-risk" investment, while also mobilizing private sector activity on the demand side to trigger more efficient energy use and more climate-compatible business practices. The Fund can also act innovatively to boost private sector involvement in adaptation projects, which until now have suffered from a lack of private capital.

The role of private investment is another area where the Fund's approach will be differentiated. The Fund is determined to partner with the private sector and harness its implementation capacity, to catalyse investment in the results areas and maximize the impact of the Fund's own investments. At points throughout this guide we outline the specific challenges and opportunities faced in the mobilization of private sector investment, in both mitigation and adaptation activities, and highlight the role of the PSF in this regard.

Adding Value

The Fund seeks to provide complimentarity to existing efforts from other sources of climate funding. For that reason, it is useful to look at where climate funding is currently directed – in relation to both mitigation and adaptation.

Public and Private Partnerships

Crowding in private investment is a key challenge in the battle against climate change, in the fields of both mitigation and adaptation. Public-private partnerships (PPP) can be a very useful tool to draw in funding from the private sector and provide an important financing opportunity for the Fund. Potential approaches may include the following:

(a) Promoting PPP in relation to energy, transportation, and forestry. To some extent, agriculture and real estate could also be fruitful areas.

(b) Encouraging or requiring NDAs to incorporate a private sector component in their national and municipal climate strategies, as part of the Fund's "readiness grants."

(c) Issuing Requests for Proposals (RFPs) targeted at the private sector and promoting local private sector investors and companies. The availability of Fund resources for private sector entities could be integrated into the issued RFP, and developing country stakeholders would be actively involved in the process.

(d) Promoting a cross-cutting approach to mitigation and adaptation opportunities. The PSF could seek investments that address both mitigation and adaptation to maximize its impact. Energy, transportation, and real estate present opportunities for adaptation in addition to mitigation. For example, climate change threatens the energy sector by putting at risk resource extraction and processing platforms, fuel transportation and storage capacity, and electricity generation and transmission infrastructure.

There are many gaps in the current landscape, and some areas that have large potential are not adequately financed through current channels. Adaptation efforts focus largely on water supply and management. The figures below on mitigation finance show the dominance of financing renewable energy projects, while less funding has been directed towards energy efficiency.

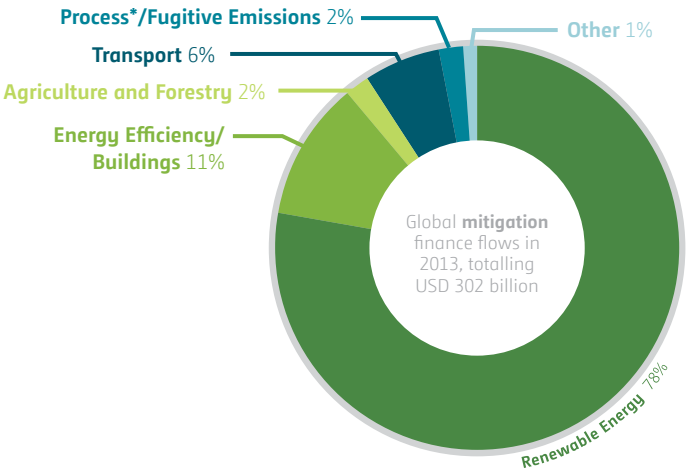


Figure 5. Global mitigation finance flows in 2013, totalling USD 302 billion

*Process emissions refer to industry processes.

Source: Buchner, et al., "The Global Landscape of Climate Finance," Climate Policy Initiative (CPI) Report (San Francisco, CPI, 2014)

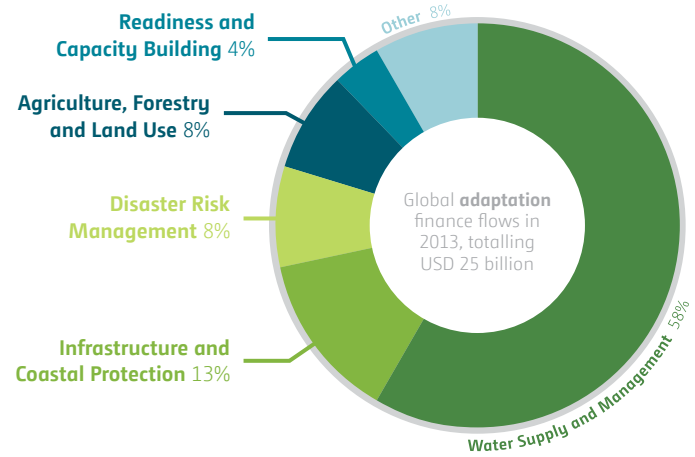


Figure 6. Global adaptation finance flows in 2013, totalling USD 25 billion

Source: Buchner, et al., "The Global Landscape of Climate Finance," Climate Policy Initiative (CPI) Report (San Francisco, CPI, 2014)

Part II: Making a Difference – The Eight Results Areas

02

The eight results areas cover both mitigation and adaptation and provide the reference points that will guide the Fund and its stakeholders to ensure a strategic approach when developing programmes and projects, while respecting the needs and priorities of individual countries.

The results areas have been targeted because of their potential to deliver a substantial impact on mitigation and adaptation. Below, we outline these results areas in turn, showing for each their potential for mitigation or adaptation, the best available estimates of costs and financing needs, and the added value we believe the Fund can bring to existing efforts.

2.1. Energy Generation and Access

Impact Potential

- The energy supply sector is one of the top contributors to the emission of greenhouse gases (GHG) into the atmosphere, accounting for 35% of the 49 GtCO2eq released in 2010. Reducing emissions from electricity generation and use through renewables and increased energy efficiency is a central part of the climate change mitigation challenge. A second challenge is to seize the significant mitigation potential associated with increased access to low-emission energy technologies.

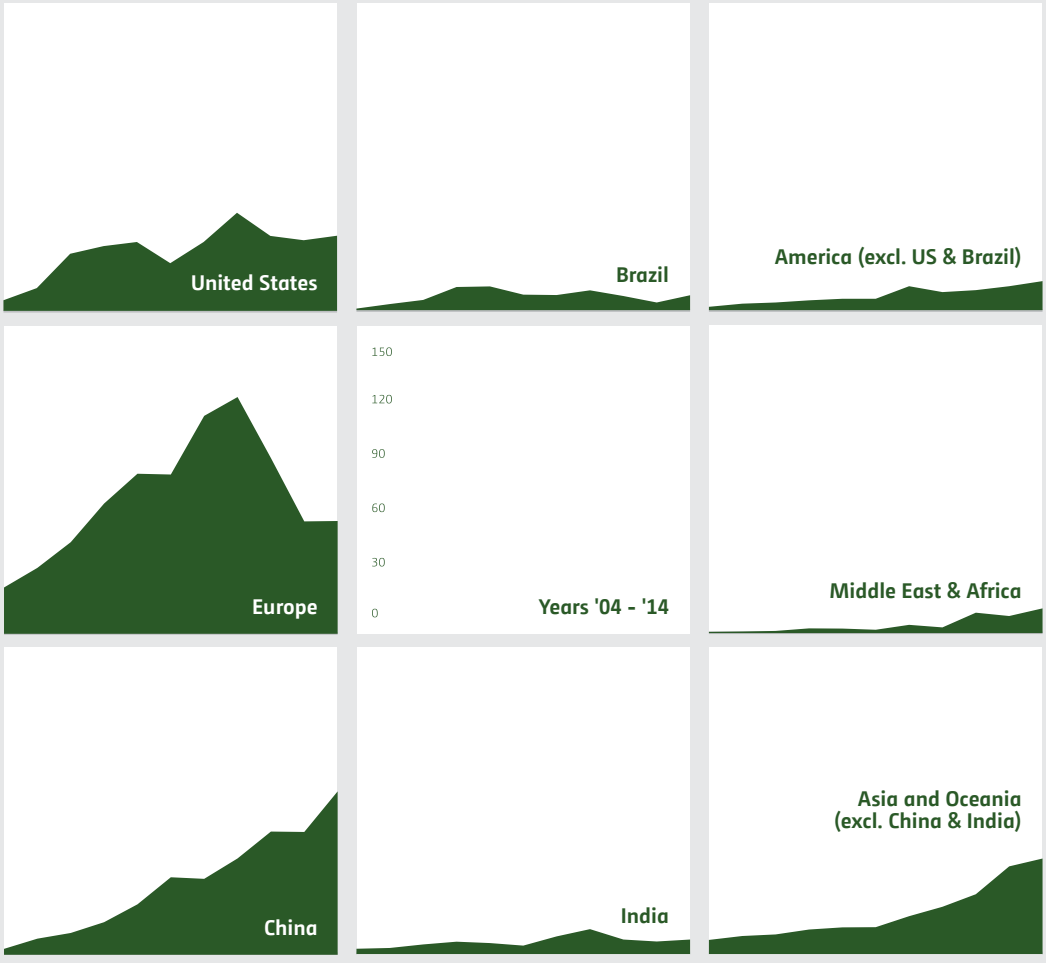
- Large-scale deployment of low-emission electricity can reduce fossil fuel reliance and mitigate climate change. Immediate gains are possible by shifting investment towards low-emission energy, including the scaling up of wind, solar photovoltaic, and mini-hydro. In LDCs, there are potential savings of 1 GtCO2eq per year to be gained by replacing conventional biomass cooking methods with cook stoves alone. Small-scale electricity generation technologies for lighting and cooling can also be cost-competitive against fossil fuel expenditure.

- Increased access to low-emission energy may be especially relevant in LDCs where an estimated 2.6 billion people are still using biomass for cooking and more than 1 billion people still lack access to electricity. Lighting and cooking are the two key needs usually highlighted. The mitigation potential from such interventions is smaller than others, but significant: up to 1 GtCO2eq per year, by replacing conventional biomass cooking methods with cook stoves alone. Co-benefits, however, are substantial and can help to support the transition to low-emission development, particularly in LDCs.

- Clean technology costs are falling rapidly, particularly for solar and wind. The costs of wind energy have fallen by 15%, and crystalline solar by 53%, since 2009; and, in many African countries, renewable technologies are already less expensive than conventional power.

Figure 7.

Renewable energy investment by region, adjusting for reinvested equity



Costs and Financing Needs

- The support of renewable energy industries was the top mitigation need identified by developing countries in their technology needs assessments, and feature prominently in countries' own climate change action plans (see above).

- The costs of extending access to clean energy to the over 1 billion people living without it have been estimated at USD 50 billion per year – possibly less with greater use of distributed renewable energy.

- Distribution is key to advancing access to energy for consumers; but poorer consumers may have difficulty accessing financing for such services, and the up-scaling of schemes to promote such access is urgently needed, not least for the co-benefit potential for health benefits and enhanced quality of life.

Where the Fund Can Add Value

- Renewable energy investment has been heavily concentrated to date in just a few key developing country economies, particularly Brazil, India, and China, as shown above. There is a major market for private investment in renewables in Africa, while support for Latin American countries may help keep their energy mix clean and away from fossil fuel dependence.

- 70% of all mitigation funding to date from climate funds has been spent on renewable energy. However, this has mostly been for particular projects or the provision of credit to financial intermediaries. Much funding to date has had limited risk tolerance and has not funded innovation. There is also a need to link projects to initiatives that strengthen underlying policy, regulatory, or enabling environments.

- Of the over 1 billion people worldwide without electricity in 2010, nearly 90% were in Sub-Saharan Africa and South Asia, most living in rural areas. By contrast, only 7% of the population in Latin America still lacks access to energy. Dependence on polluting biomass for cooking is highest in the rural areas of South Asia and Sub-Saharan Africa, particularly the LDCs.

2.2. Transport

Impact Potential

- Transport contributes 13% of global CO2 emissions, and under current trends this might rise by 25% by 2030. Mitigation potential exists from the adoption of new transport technologies, including alternative fuels, more efficient engines, and electric and hybrid technologies. More sustainable approaches to urban transport and infrastructure planning can have a huge impact on future emissions trajectories. Transport is one of the top sectors identified in developing countries' technology needs assessments.

- Policy and regulatory measures are required alongside financial investment to reap the potential for GHG emission reduction in transport. Potential areas include fuel efficiency standards. By reducing fossil fuel subsidies, regimes can encourage the transition to alternative fuels to reduce emissions, such as with electric vehicles, natural gas, and biofuels (which may also be subsidized). However, the expansion of biofuels can have a substantial negative impact on food security due to the large areas of land required for cultivation, thus making this a more difficult investment area for the Fund.

Costs and Financing Needs

- The capital investment requirements for transport sector interventions are often quite high, although the economic returns may often be positive. Co-benefits such as improved health and accessibility may further offset the costs, and investment in transport infrastructure is in many cases central to national development strategies.

- Investments in more sustainable approaches to meeting transport needs can reduce net spending on transport infrastructure and have the potential to dramatically reduce necessary investment in roads, particularly in cities in developing countries.

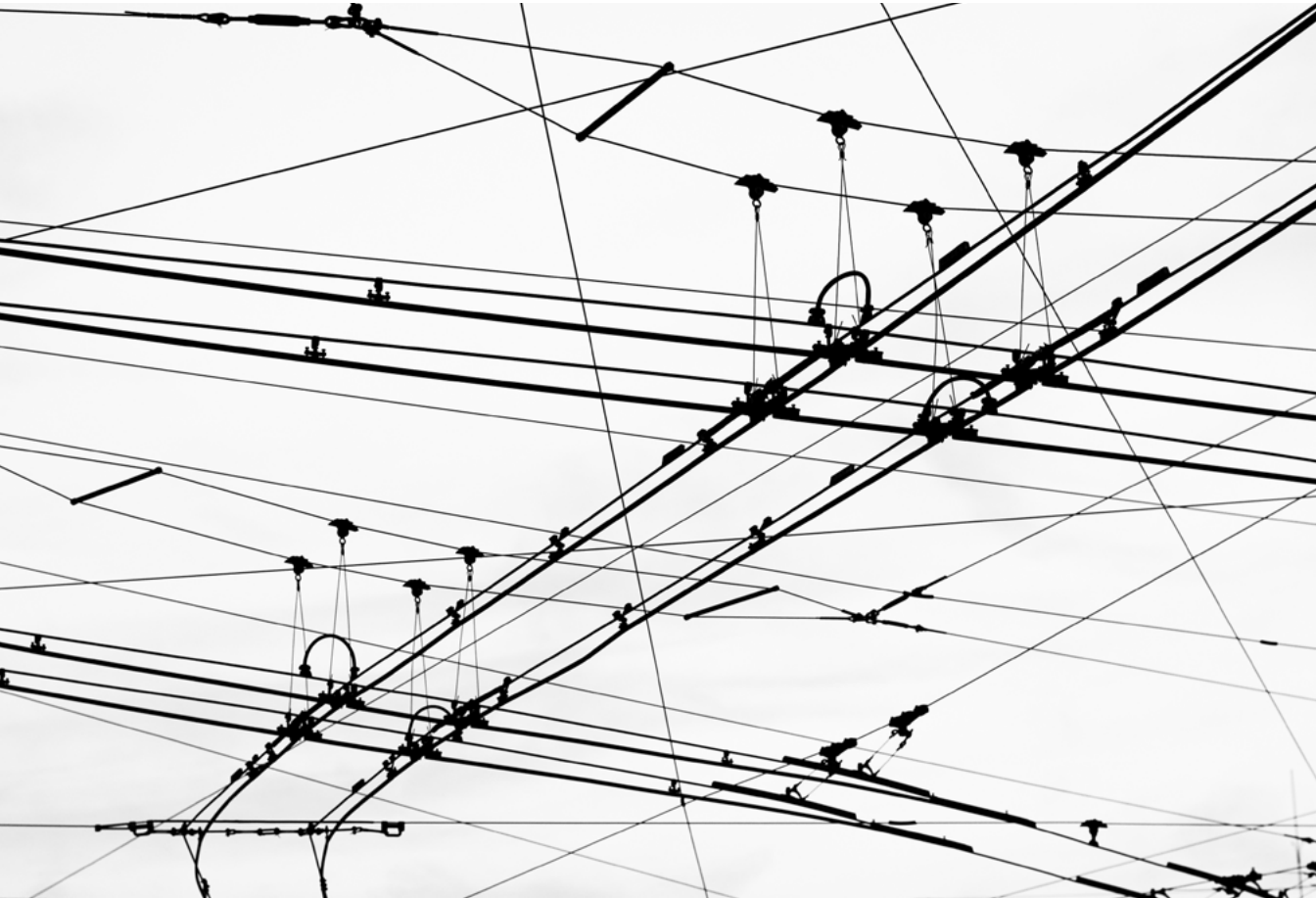
Where the Fund Can Add Value

- Urban transport will have a distinct impact on future emissions, yet account for a growing, though relatively modest, share of existing mitigation finance. Niche approaches by the Fund to support mitigation through the transport sector could include directing transport investment to support low-emission and climate-resilient cities, prompting a more central focus on climate impact. There are also opportunities to reduce emissions from freight transport.

- Latin American cities have pioneered more sustainable transport systems, notably bus rapid transit, that could be scaled up to provide a more attractive alternative to conventional car use. The region concentrates the largest volumes of private investment, together with South Asia and Eastern Europe, suggesting scope to direct that investment towards lower emission and more resilient approaches and away from business as usual.

- Cities in Asia and Africa, in turn, are making decisions now that will affect development over the next several decades. The Asian continent has, by far, the largest abatement potential in the sector. Low-carbon transport programmes, including at the urban level, account for a growing, though relatively modest, share of existing mitigation finance. A focus on approaches that integrate policy, institutional development, and concrete investments is needed.

- Transport systems in Sub-Saharan Africa are typified by high transport costs and low population densities. The region is also expected to experience the highest rate of urbanization over the coming decades – with city densities poised to increase significantly – and a large investment gap for urban transport infrastructure.



2.3. Buildings, Cities, Industries, and Appliances

Impact Potential

- Increasing the energy efficiency of buildings and appliances can save between 3.3 to 4 GtCO2eq per year by 2030, according to the IPCC, as well as offer substantial economic returns. Better technologies, energy-efficient designs, and behaviour changes can help reduce energy use in buildings, by 50-90% in new structures and 50-75% in existing ones.

- The global mitigation potential for industries (including both efficiency measures and the adoption of lower emission sources of energy) is estimated at a remarkable 5.5 to 7.5 GtCO2eq for 2050, with more than 40% of this potential in India and China. There are relatively low-cost and easily implementable options in some sectors – for example, in the cement industry, which provides a large source of emissions (5% of the total projected for 2030).

Costs and Financing Needs

- Cost estimates of interventions aimed at increasing energy efficiency through buildings, industries, and appliances vary greatly and are shaped by many factors, including energy and construction costs. In the case of new green buildings, up-front financing needs may be large, but the savings associated with the scaled-up adoption of more energy-efficient approaches often pay for themselves.

- For energy-intensive industries, the main barrier to energy efficiency interventions is the initial investment cost for retrofits, while barriers for other industries include both cost and a lack of information in both industry and financial institutions.

- Improvements in material and product/service efficiency, as well as demand reduction, could be achieved by addressing the lack of incentives for consumers and suppliers and knowledge gaps in implementing such approaches.

Where the Fund Can Add Value

- Only 12% of approved mitigation finance from dedicated climate funds has been dedicated to energy efficiency programs so far.

- The potential for energy efficiency and green building construction in developing countries, particularly Eastern Europe, Latin America, and rapidly urbanizing Asia and Africa, remains untapped. Financing levels are small relative to investment in renewable energy, for example. The potential to develop and pilot innovative instruments that scale up available financing for larger scale investments, potentially together with strengthening policy, pricing, standards, and other incentives for efficiency, may present a possible niche for the Fund.

2.4. Land Use, Deforestation, Forest Degradation

Impact Potential

- Agriculture, forestry, and land use are responsible for close to a quarter of global GHG emissions, predominantly from deforestation and agricultural emissions.

- Gross forest losses are estimated in the region of 13 million hectares a year over the last decade. Reducing emissions from deforestation and forest degradation alone may account for 24-30% of global mitigation potential and offers a wide array of co-benefits. Reducing deforestation offers greater mitigation potential at a lower cost than afforestation and other forest management interventions.

Figure 8.

Co-benefits associated with forest conservation

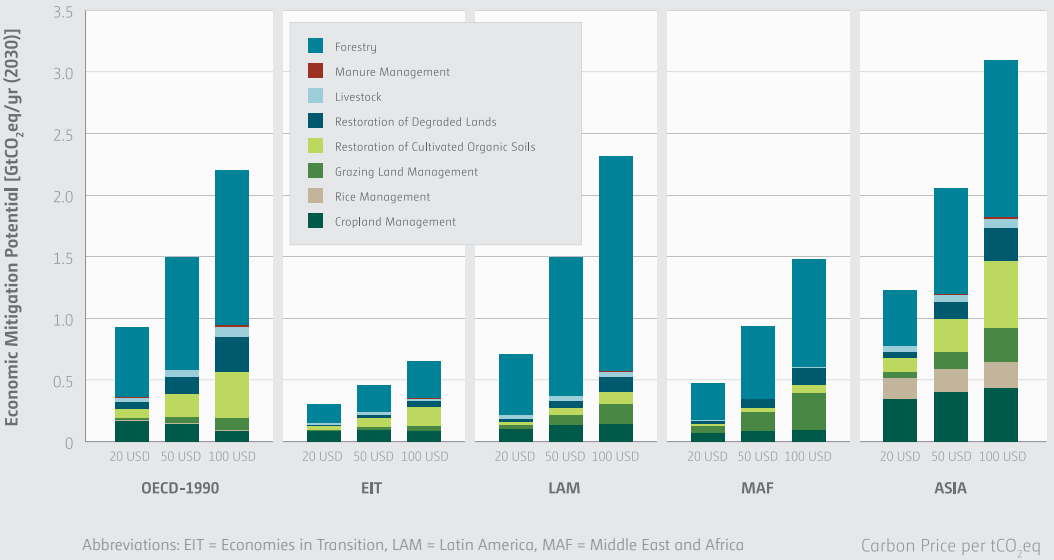
Source: Center for Global Development. "Why Forests? Why Now?" (2014)

Costs and Financing Needs

- Reducing deforestation and forest degradation has the potential to deliver over 10 GtCO2eq per year at a relatively low cost. Cost of action varies by region, as can be seen below, with significant low-cost mitigation potential from forests in Latin America and some Asian countries.

Figure 9.

Mitigation potential by region at costs under USD 20, USD 50, and USD 100



Source: IPCC. Working Group III Contribution to the Fifth Assessment Report (New York, 2014)

Where the Fund Can Add Value

- The highest potential for emissions reductions lies in the large swathes of tropical forest remaining in Latin America and the Caribbean, Central Africa, and Asia.

- Multilateral finance for Reducing Emissions from Deforestation and Forest Degradation (REDD+) activities to date accounts for about 10% of total climate finance through multilateral climate funds, although total public and private finance for REDD+ activities has fallen substantially since 2010. However, there is new momentum behind these efforts as countries agree on new principles to protect forests and private companies commit to ensure that their supply chains do not drive deforestation. There is potential for the Fund to utilize the REDD+ results-based payment mechanism to overcome this.

- There is a clear need to drive private sector activity on REDD+ action, given that many of the drivers of deforestation are linked to private activity related to agriculture and timber. To date, however, there has been limited success in raising significant private finance for forest- and land use-related activities.

- Efforts of the Fund will need to be context specific. Latin American activities, for example, may focus around drivers linked to large-scale agriculture and unsustainable timber harvest; while small-scale agriculture would be a key driver to focus on in Africa; whereas, in Asia, multiple interests often overlap, including land use rights and the quality of forest governance.

Private Sector Investment in Adaptation

Until now, investments in adaptation have largely come from the public sector; but, there is huge potential for private sector investment in this area. Standard & Poor's has identified climate change as one of only two megatrends that are expected to cause a material adverse change on global economic prosperity. Its research shows how vulnerability is greatest amongst countries that are poor and heavily dependent on agriculture and forestry.

Figure 10.

Prosperity and vulnerability to climate change

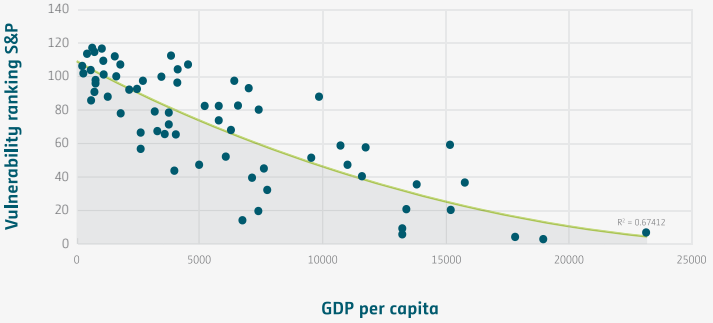
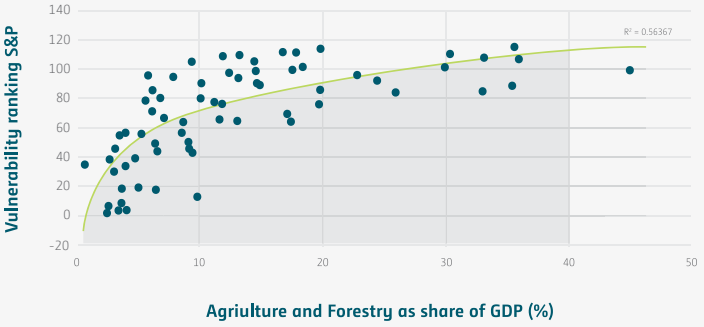


Figure 11.

Dependence on agriculture and vulnerability to climate change

Source: Center for Global Development. "Why Forests? Why Now?" (2014)



There are opportunities in particular for the PSF to focus on private investment in the agriculture and forestry sectors, which are more suited to the private sector's needs, than other adaptation projects, such as infrastructure and coastal protection, which do not typically generate revenue flows. Such projects could include diversification of crop and seed varieties, forest farming and deforestation combating, irrigation extension and efficiency, rainwater harvesting, and water source diversification. These could all not only improve resilience but also contribute to economic development, thus improving people's lives in these countries.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2.5. Enhanced Livelihoods of Vulnerable People and Communities

Impact Potential

- A livelihood is sustainable when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets, while not undermining the natural resource base. Climate change threatens efforts to secure sustainable livelihoods for vulnerable people and communities as a result of climate-related hazards such as reduced crop yields, food insecurity, and higher food prices.

- The IPCC notes that poor people are not all equally affected; and not all vulnerable people are poor. People's vulnerability to natural hazards or capacity to cope, manage, and respond to disasters is dependent upon different social, economic, cultural, and political processes that influence "how hazards affect people in varying ways and with differing intensities." There is strong evidence that gender inequality is exacerbated as a result of weather events and climate-related disasters.

- At the same time, exposure to disasters is "increasing as more people and assets are located in hazard-prone locations." This is often as a result of population and economic pressure, more people living in coastal and exposed areas to secure life-sustaining livelihoods, and the degradation or loss of natural ecosystems.

- Vulnerability varies from region to region, with funding for adaptation needs being particularly needed in Sub-Saharan African countries, LDCs, and SIDS, as well as to South Asian countries, as seen below.

- Disaster risk reduction measures and development planning can help address vulnerability, as can social protection programmes and efforts to strengthen people's assets and the policies, institutions, and processes that shape their livelihoods in terms of adaptation to climate change. Interventions to enhance livelihoods may include protecting water sources or coastlines, preventing erosion and landslides, evading food insecurity, or providing insurance in response to climate events.

Costs and Financing Needs

- More than 2.5 billion people globally depend on natural resources-based primary sector activities such as agriculture, pastoralism, and fishing as their main source of income. Declines in primary sector productivity as a result of climate change can keep 250-500 million people in extreme or moderate poverty, on less than USD 2 per day at purchasing power parity. Those with climate-sensitive livelihoods, including agricultural smallholdings, fishing, pastoralism, and tourism, will feel the effects of climate change the most directly and strongly.

- Climate change will create new poor between now and 2100, in low-, medium-, and high-income countries, with the majority of severe impacts projected for urban areas and some rural regions in Sub-Saharan Africa and Southeast Asia.

- Efforts to increase resilience to climate shocks are increasingly being integrated into national development policies; but there remains a dearth of funding to support disaster risk reduction.

- Many livelihood initiatives, such as access to insurance, diversification of livelihoods, migration, food storage, communal pooling, market responses, savings, credit societies, and systems of mutual support, require some resource investment at the outset that climate finance could support. Climate finance can also support efforts to strengthen social protection systems in the context of climate change.

Where the Fund Can Add Value

- Many approaches exist to strengthen the resilience of livelihoods to the impacts of climate change. These are inextricably linked to wider efforts to support development, disaster risk reduction, and poverty reduction in the poorest countries. Adaptation finance will have an important role in raising the profile of climate risk in development, disaster risk, and policy programming in recipient countries, and in exploring programmatic approaches to this end.

- The connection between the global concentrations of poverty by geography alongside vulnerability to climate change is shown in **Figure 12.** Poor people in regions most affected, such as South Asia and Sub-Saharan Africa, largely depend on agriculture for their livelihoods; so, efforts to strengthen the resilience of the agriculture sector may offer major impact potential for the Fund.

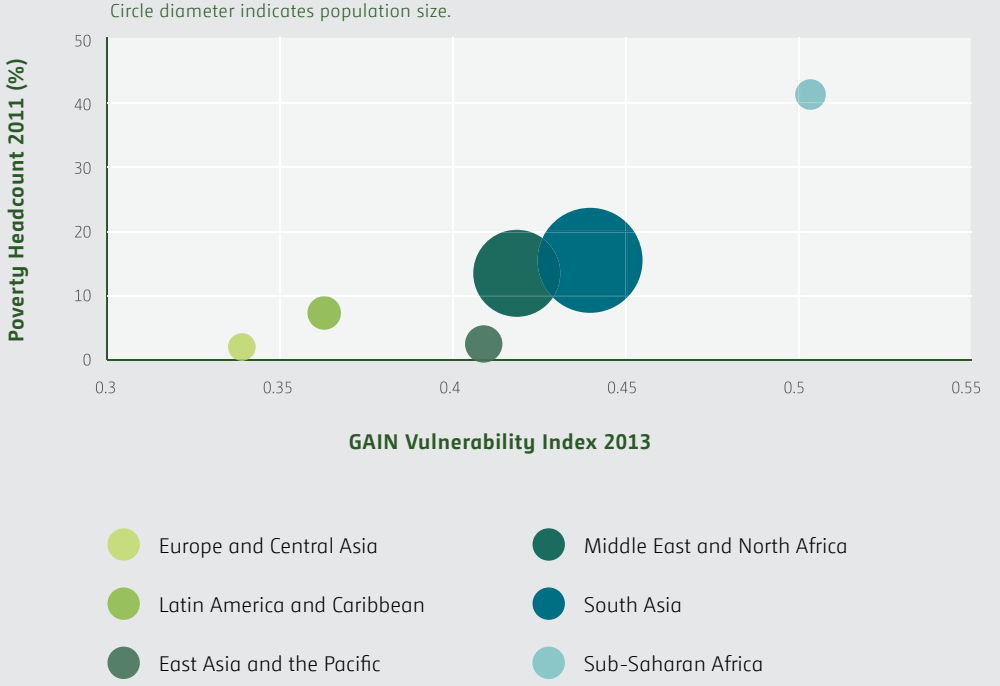
- Investing in the resilience of agriculture and those who depend on it for their livelihoods can be a key target for the Fund. There is also huge potential for the Fund to partner with diverse public and private sector institutions that are involved in such efforts, including the insurance industry.

- The use of social protection programmes to help address climate-related shocks and pressures on farmers has been piloted in several countries and may have the potential to be scaled up. There is also significant potential to work with the insurance industry to extend access to insurance programmes that address climate-related risks, seeking to create incentives for adaptive action at the national level.

- In the case of SIDS, where tourism-based livelihoods are also poised to come under immense pressures, engaging the tourism industry may hold the key to improving the resilience of livelihoods.

Figure 12.

Poverty and vulnerability to climate change, by region



Source: ND-GAIN Index 2014 and World Bank Poverty Indicators

2.6. Food, Water Security, and Health

Mitigation & Adaptation Potential

- Climate change is expected to have major effects on health and well-being in developing countries and on food and water systems.

- Food security is particularly threatened by climate change. Disruptions to agricultural production are a major source of concern, especially since demand for food is projected to increase by 50-70% by 2050. An estimated 10-20% more people will be hungry as a result of climate change by 2050, with Sub-Saharan Africa likely to be most affected. Using more resilient crops and farming techniques could help counter this threat, although the effectiveness of such adaptation would be highly variable. There is also substantial potential to reduce food waste during processing and consumption.

- Climate change is likely to result in increased water scarcity for many people, as well as threats to ecosystems. Both surface water and groundwater resources will be significantly reduced in dry subtropical regions – in other words, dry places are likely to get dryer. This will also affect agriculture in many regions, particularly South Asia, as well as industry and domestic use. Limited availability of water threatens attempts to improve access and quality of sanitation facilities, as well as the health of ecosystems such as oceans and rivers.

- Health may be affected through extreme weather including heat, drought, and heavy rain, as well as through disease and illness.

Costs and Financing Needs

- While the impacts of unfettered climate change on health are likely to be significant, they may not manifest for some time. Adaptation needs are highly uncertain, with water and agriculture adaptation likely to be expensive in the immediate term. Agriculture has been a priority in LDCs' efforts to identify adaptation needs, accounting for nearly half of financing costs for National Adaptation Programmes of Action (NAPA). Water security has received some attention as well; but much less priority has been given to health needs, which are also closely related to water management (e.g., floods and infectious diseases).

Where the Fund Can Add Value

- There are many "no regrets" entry points for GCF to support better outcomes under this results area. Actions will be closely linked to development.

- Support for resilient agriculture, which can reduce food security risks as well as pressures on water supply, is rising, also through the scaling up of information technology for hydro meteorological systems. Food security issues are likely to grow, particularly in Sub-Saharan Africa, while demand for agricultural land to meet food needs may drive further deforestation in Latin America. Health adaptation needs will be high in Africa and South Asia, while spending on this theme has been low to date.

- Strengthening the resilience of cities can also deliver integrated outcomes in this result area, by improving water sanitation and management systems and infrastructure in urban areas. The Fund can seek to improve water management systems and infrastructure.

2.7. Infrastructure

Mitigation & Adaptation Potential

- Infrastructure faces significant risks as a result of climate change and cuts across multiple results areas of the Fund. It is at the heart of the mitigation challenge: efforts to reduce emissions from energy, buildings, transport, and cities all require fundamental shifts in the way infrastructure services are built and delivered. Resilient infrastructure systems such as integrated water supply systems can reduce vulnerability to climate change. The challenge for the Fund will be to help shift investment decisions so that these infrastructure facilities are both less emission-intensive and more resilient to climate impacts.

Costs and Financing Needs

- Developing countries face particular challenges in raising finance for infrastructure, including from the private sector. Perceptions of country risk and the long timeframes of the investments involved compound these challenges.

- Infrastructure adaptation implies high costs. Middle-income countries including Brazil, Indonesia, Mexico, Mongolia, Philippines, South Africa, and Vietnam are in the process of seeking scaled-up infrastructure investment to improve the quality and coverage of their services. Many African countries on the other hand are facing substantial infrastructure deficits, especially related to transport, water, and energy.

Where the Fund Can Add Value

- The most obvious risk to infrastructure from climate change is in coastal areas as a result of sea level rise and flooding. Coastal populations in Asia are particularly exposed because of very high population densities, with large urban populations at risk.

- Africa faces an infrastructure gap, and massive investment is under way to meet development needs. Strengthening the resilience of these investments in climate change and ensuring that they help deliver low-emission and climate-resilient pathways in the long term is a key challenge.

- Through focus on financing climate-compatible cities, the Fund may be able to help support an integrated approach to infrastructure that offers both resilience and mitigation benefits. The risk of "maladaptation" (i.e., investments that in fact do not support the ability to weather or respond to the impacts of climate change) needs to be managed carefully.

2.8. Ecosystems and Ecosystem Services

Mitigation & Adaptation Potential

- Ecosystem services are the benefits to humans that arise from the interactions between components of an ecosystem. Climate change will further impact natural systems, affecting ecosystem service flows, and driving ecosystem degradation. Ecosystem-based adaptation may offer flexible and cost-effective options to address risks that can also deliver co-benefits for mitigation, livelihood protection, and poverty alleviation. Coral reefs and coastal ecosystems, for example, protect communities from storms and erosion, reducing damage costs and potentially saving lives.

- Ecosystem services can promote resilience, reducing exposure to natural hazards and building adaptive capacity. Understanding of how ecosystem-based adaptation works is still evolving. However, there are obvious links with other results areas of the Fund, including water, agriculture, and forests.

Costs and Financing Needs

- Holistic investment in ecosystem services is complex, as their provision involves and incorporates many systems over multiple scales, and interacts with national considerations such as land use rights, environmental governance, and policy responses. Hybrid measures combining ecosystem-based and traditional approaches have substantial potential.

- Costs of ecosystem adaptation projects should be compared to other adaptation projects. For example, costs of seawalls or other hard infrastructure may well exceed costs to protect existing reefs that serve similar functions.

- Seeking scaled-up infrastructure investment to improve the quality and coverage of their services. Many African countries on the other hand are facing substantial infrastructure deficits, especially related to transport, water, and energy.

Where the Fund Can Add Value

- Assessment of ecosystem services projects shows highly variable cost-benefit ranges, but the majority of such projects should be high-yielding investments. Coastal and inland wetlands, coupled with tropical forests, seem to offer substantial value for ecosystem restoration investment.

- Current ecosystem-based adaptation is being funded in a small number of cases through existing climate funds. Some projects have focused on the role of forests and ecosystem-based adaptation approaches, but much less to the impact of climate change on coral reefs. Focusing upon coastal ecosystems like coral reefs may be particularly relevant in SIDS, where they are threatened.

Part III: Cross-Cutting Investment Priorities – Working Across the Fund's Results Areas

03

On the basis of our review of the eight results areas in which the Fund seeks to achieve impact, five high potential entry points emerge as particularly promising areas for the Fund to encourage investment and programming efforts that develop a more integrated approach to mitigation and adaptation impact:

(i) Climate-compatible cities;

(ii) Sustainable low-emission, climate-resilient agriculture;

(iii) Scaled-up finance for forests and climate change;

(iv) Enhanced resilience in SIDS; and

(v) Transformed energy generation and access.

These five potential investment priorities contribute to each of the results areas. So, for example, efforts to invest in climate-compatible cities may deliver impacts related to four different results areas. They can promote emission reductions from transport as well as buildings, cities, industries, and appliances. They may also support adaptation, particularly by helping to strengthen the resilience of the livelihoods of urban people and communities and urban infrastructure (while also reducing associated emissions).

The five investment priorities cluster the eight results areas, aiming to achieve cross-cutting benefits in an efficient and impactful way. The investment priority areas largely contribute to both mitigation and adaptation, creating entry points for investment that support the balance across mitigation and adaptation seeked by the Fund.

In all of the investment priorities, there is a strong link between national and international policies, institutional incentives, and the outcomes that the Fund seeks to help realize. It is difficult to put relative a value on how much potential hinges on strengthening the enabling environment versus mobilizing finances, but it is clear that the Fund needs to take a strategic approach to both issues in its programming decisions. The Fund has the opportunity to provide finance that supports and enables countries to pursue reforms as well as concrete investments. The Fund's readiness programming is already helping to advance this approach.

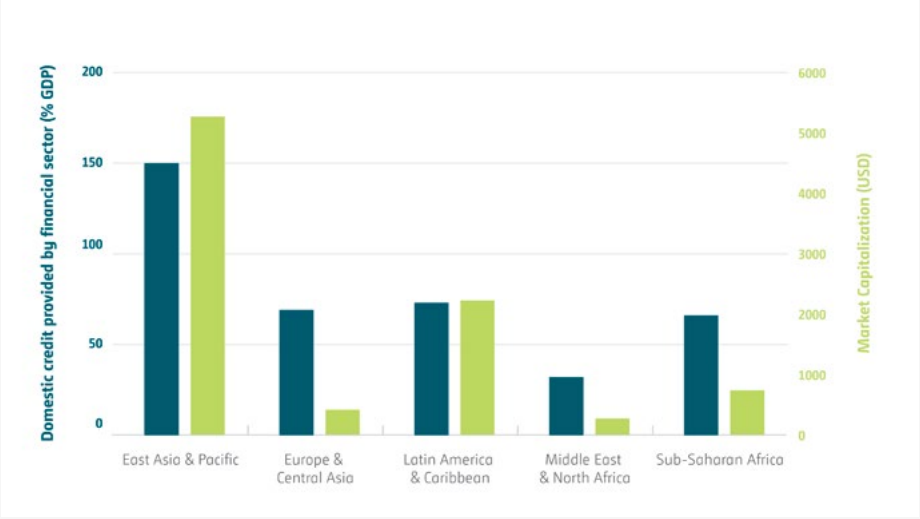
In addition, the assessment also highlights the need for cross-cutting support for innovation and institutional capacity in developing countries, potentially in partnership with innovation centres and business communities. The Fund may also consider providing support for better information on climate risk and impacts in countries, and mechanisms to aggregate this information globally, to better inform and influence national and international investment decisions by both the public and private sectors.

Availability of Capital Markets

The private sector in developing countries has three sources of capital: local banks (including foreign banks with local commercial banking licenses), local capital markets, and foreign direct investment either in the form of debt or equity. The availability of such capital varies immensely from region to region, as seen below, and the Fund's approach will need to be adjusted to take this into account.

Figure 13.

Domestic credit provided by the financial sector and market capitalization



Developing Asia may present the greatest opportunity for the use of market-based instruments such as securities, and for the crowding in of local investors.

In areas where local capital is limited, this might mean:

a) Relying more on development banks as intermediaries;

b) Playing a greater role in providing capital for climate activities, including taking on higher levels of risk, and providing liquidity when needed (for instance, through the use of guarantees);

c) Investing for the long term – bilateral, syndicated, club, and private placement agreements could take precedence over the use of securities;

d) Providing foreign direct investors with an "exit," for example, through forward purchase agreements or the introduction of international market-based refinancing facilities; and

e) Focusing primarily on small- and medium-scale projects, supplemented by occasional large-scale projects.

In countries where access to local capital is readily available, the Fund could:

a. Rely to a greater extent on local commercial and investment banks as intermediaries;

b. Provide targeted support for projects and programmes that require additional risk-bearing capacity, capital, and/or liquidity to make them commercially viable for the local financial sector;

c. Invest with a view to sell down a portion of its exposure before maturity. Securities-based transactions could play as important a role as bilateral, syndicated, club, and private placement agreements; and

d. Focus on both large-scale as well as small- and medium-scale projects.

3.1. Climate-Compatible Cities

Cities consume more than 75% of the world's natural resources and use 60-80% of the world's energy. They are responsible for 75% of global emissions, while hosting more than 50% of the global population. Reducing emissions from cities can therefore make a major contribution to global mitigation efforts.

Cities are also likely to be highly vulnerable to the impacts of climate change, making adaptation a priority. Many cities in low- and middle-income countries are in coastal areas, and in many cases poor communities live in informal settlements on land at high risk from extreme weather. Climate change risks for cities are rising, including rising sea levels, storm surges, heat stress, extreme precipitation, inland and coastal flooding, landslides, drought, water scarcity, and air pollution. These factors can affect people's livelihoods and health, ecosystems, and local and national economies.

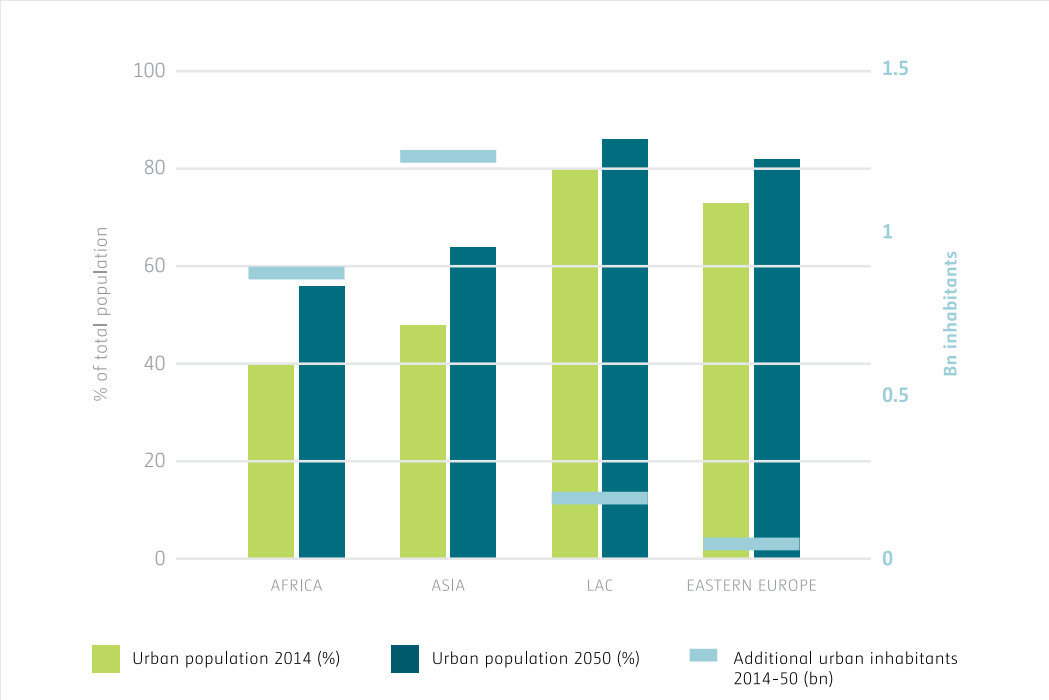
Investing in lower emission and more climate-resilient cities therefore offers immense cross-cutting potential for both mitigation and increased resilience.

While cities have different needs, some major priorities can be identified. There is a huge opportunity to tackle urban energy consumption. Many cities are not yet able to assess local energy consumption for heating and cooling, develop strategies to reduce consumption (for example, by using local energy sources such as district energy), or coordinate across sectors (waste, water, buildings, transport, and power) for effective implementation.

Building use, waste management, and passenger and freight transport are also major areas where there is high mitigation potential. Buildings represent the largest potential for abatement, whether by improving their energy efficiency or installing renewable energy. Passenger transport – largely due to modal shifts, car efficiency, electrification, and urban planning – also has high potential for impact in cities.

Figure 14.

Poverty and vulnerability to climate change, by region



Where the Fund Can Add Value

- Despite high potential, urban climate change mitigation and adaptation receive relatively modest support from existing climate funds. The Fund can promote more innovative engagement of both the public and private sectors, to deliver significant results in cities.

- There are several existing initiatives linking cities and climate, which the Fund can build on and support. Furthermore, if more national, local, and private sector institutions become accredited entities, this would increase the Fund's effectiveness in city-level interventions.

- Energy efficiency in buildings and industries has high abatement potential in cities, but has not yet been effectively addressed by other major climate finance institutions.

- There is also a strong potential for approaches that combine several results areas and deliver social and economic co-benefits – for example, in the creation of landfill sites using landfill gas for energy and heat generation, reducing methane emissions from waste and the environmental and social impact from unregulated dumps.

3.2. Low-Emission and Climate-Resilient Sustainable Agriculture

Agriculture accounts for 10-12% of global emissions, and tackling climate change and agriculture links is already high on the agendas of developing countries. However, progress in mainstreaming climate change into agricultural planning and systems is at an early stage for many of them.

Although the emissions intensity of some commodities has fallen over the last two decades, emissions from agriculture as a whole are expected to grow by 1% annually until 2030. These increases will largely be driven by an increasing population, creating more agricultural demand, together with increases in GDP, leading to shifting diets and higher demand for meat (livestock production releases more emissions than crop production).

The IPCC suggests that the world will need to produce at least 50% more food to meet the goal of feeding a projected 9 billion people by 2050. This must be achieved in the face of climatic volatility and change, growing constraints on water and land for crops and livestock, and declining wild capture fishery stocks. Adaptation measures in agriculture can increase the resilience of food systems and strengthen food security.

Furthermore, low-emission, climate-resilient agriculture can support the improvement of livelihoods, safeguard access to food and water, strengthen the resilience of ecosystems, and reduce pressures on forests (as land use change for agriculture is a major driver of deforestation).

If well-conceived and delivered, low-emission, climate-resilient agriculture can contribute to multiple Fund results areas.

Where the Fund Can Add Value

- Despite its potential, there has been relatively modest emphasis on low-emission, climate-resilient agriculture so far from existing climate funds, with much financing focusing on adaptation activities.

- The Fund could support mitigation and adaptation activities that would contribute to both agricultural development and food security. In addition to more traditional activities like altering crops and crop varieties, improving the effectiveness of crop and livestock management practices by altering the timing of cropping or water management can work to introduce a wider range of instruments, to be used particularly by private- and community-level actors.

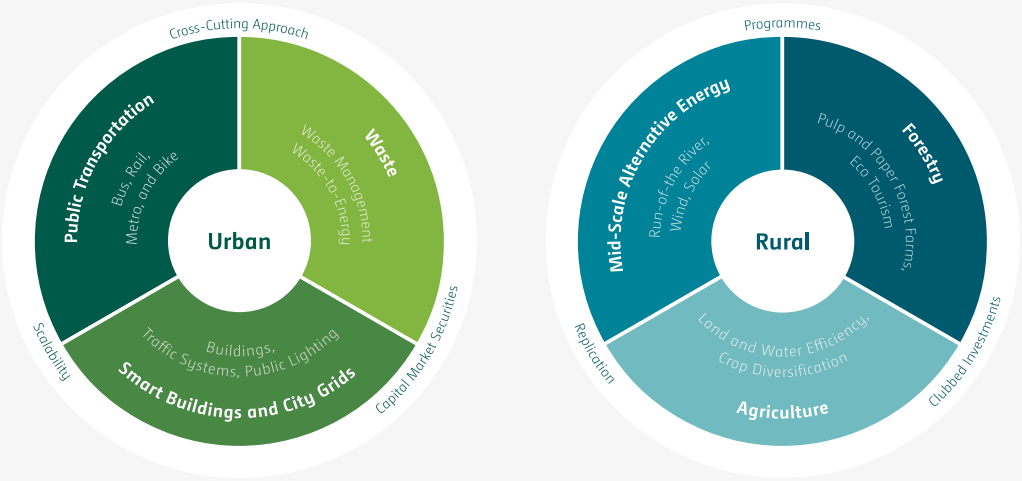
- Support for smallholder farmers would help to deliver direct benefits to communities and poor and vulnerable farmers, particularly women, and strengthen the resilience of their livelihoods.

- Shifting the practices of agribusiness and larger producers could support mitigation, wider food security benefits, and adoption of more sustainable agriculture.

- The environmental and social safeguard policies of the Fund will be essential in realizing these opportunities appropriately.

Private Sector Investments: The Urban and Rural Approach

Figure 15.
Urban and rural approach



In urban areas, the PSF may support the Fund's efforts to create climate-compatible cities, particularly by mobilizing private investment in public transport, waste management, and waste-to-energy, as well as in smart buildings and city grids. It can fund initiatives that are cross-cutting, scalable, and attractive to finance from other sources, including capital markets. In rural areas, the PSF might focus on mid-scale alternative energy, forestry, and agriculture. The PSF could fund initiatives that take a programmatic approach, are replicable, and are financed through clubbed investments.

3.3. Scaling Up Finance for Forests and Climate Change

Net losses of forest cover exceed 7 million hectares per year. Together, agriculture and forestry account for a quarter of global emissions. Although the division of these emissions between agriculture and forestry is approximately half, they are highly interlinked, complicating estimation.

Reducing emissions from deforestation and degradation has potential to offer multiple benefits, sometimes at a comparatively low cost. Most multilateral funding for forests has focused on readiness activities. The Fund has the potential to catalyse continued and more ambitious efforts.

The greatest mitigation potential from forestry is through avoided deforestation – protecting forests before they are damaged or lost. Avoided deforestation and sustainable forest management can also support adaptation. Knowledge of how to maximize the resilience of both ecosystems and livelihoods through forests is still emerging, but resilience can be built by the contribution of forests to ecosystem services (such as the protection of soil, flood defence, or the provision of non-timber forest products as safety nets). Forests can also support employment and income generation – there are an estimated 14 million people employed in the formal forest sector, and this number could be boosted by new investment in forest management, supporting the Fund's livelihood objectives.

Where the Fund Can Add Value

- Some time has passed since the REDD+ commitments were made, and there is a need to create new incentives to sustain political action on forestation. The Fund cannot close the REDD+ financing gap alone, but it can help create new incentives for action by providing results-based finance, targeting interventions at sufficient scale.

- These interventions will differ across both countries and regions, responding to country needs and circumstances. For maximum impact, the Fund may choose to provide results-based financing for initiatives in countries that show clear momentum for mitigation, as well as co-benefits such as ecosystem services and livelihood results. The Fund could also choose to provide additional finance for countries that have already made REDD+ commitments, to sustain political momentum around their implementation.

- Governance is a major barrier to the implementation of REDD+ activities in most developing countries. The Fund could help address this by partnering with a broad range of stakeholders. This could include private sector actors – both those whose activities place pressure on forests and who have made commitments to reducing deforestation and to sustainable forest management. The Fund could also partner with sub-national government and civil society organizations, to improve understanding of land rights and promote transparency and accountability of relevant institutions. Investing in strengthened governance including land rights and tenure regimes will be a key to success.

3.4. Enhancing Resilience in Small Island Developing States

Many SIDS face an existential threat as a result of climate change, and are highly vulnerable to its impacts. Projected costs of climate change may amount to as much as 1% of GDP in SIDS, five times as much as in other regions. Both coastal and terrestrial ecosystems are threatened.

Some SIDS can avoid as much as 90% of potential damage through cost-effective adaptation measures. Historically, however, SIDS have had relatively limited access to climate finance, in part due to their size, and also because of results frameworks that have prioritized the cost-effectiveness of large-scale results.

Transitioning to lower emission energy systems while strengthening resilience can produce win-win scenarios for SIDS. This is because conventional energy costs take a huge share of the budget in many SIDS, so that moving to lower cost energy options such as renewables and energy efficiency can free up resources for adaptation at the same time. To date, however, domestic policy and regulatory environments have not encouraged greater investment in low-emission energy, and there has been a dearth of investment despite their relative cost effectiveness.

Because climate change exacerbates stresses on freshwater availability, there are also opportunities to strengthen water management systems and infrastructure. The ecosystems (coastal, including coral reefs, as well as terrestrial, sometimes including rainforests) of SIDS are also highly vulnerable to climate change, prompting strong interest in ecosystem-based adaptation approaches.

Where the Fund Can Add Value

- Many SIDS are suffering from fiscal constraints following the financial crisis, undermining their resilience to new climate-induced shocks. Unsustainable development patterns in many SIDS also exacerbate climate risks, while freshwater supplies are under intense pressure, including as a result of population growth, increasing urbanization, and tourism.

- In this context, there is a strong case for the Fund to continue supporting efforts to incorporate climate risks and opportunities into national economic development and planning strategies, potentially in partnership with regional financial institutions.

- The Fund can also help countries progress with reforms in energy policy and regulatory frameworks, to reduce reliance on conventional energy imports and improve the efficiency of energy provision, buildings, and industries.

- Partnerships with regional financial institutions and centres of excellence can help deliver such programmes at a greater scale and with lower transaction costs. There is, however, a need for institutional strengthening of these organizations, in which readiness support, technical assistance, and capacity building efforts may have an important role.

- There is also scope for more creative collaboration with the private sector. For example, the tourism industry in many SIDS has recognized climate risks to freshwater and energy and is already adopting solar water heating, renewable energy systems, and energy efficiency measures, and investing in desalination facilities. The Fund can explore opportunities to scale up such efforts.

3.5. Transforming Energy Generation and Access

Reducing emissions associated with energy generation as well as use is central to climate change mitigation. Energy is also a cross-cutting input into most segments of the economy.

The Fund will need to address two challenges in this investment priority:

- Shifting investment to large-scale deployment of low-carbon electricity, to avoid dependence on fossil fuels; and

- Supporting the extension of access to sustainable energy services for poor and underserved communities.

The Fund will need to adopt distinct strategies and partnerships to support large-scale deployment, scaled-up finance, and cost reductions if such transformations are to be achieved.

Where the Fund Can Add Value

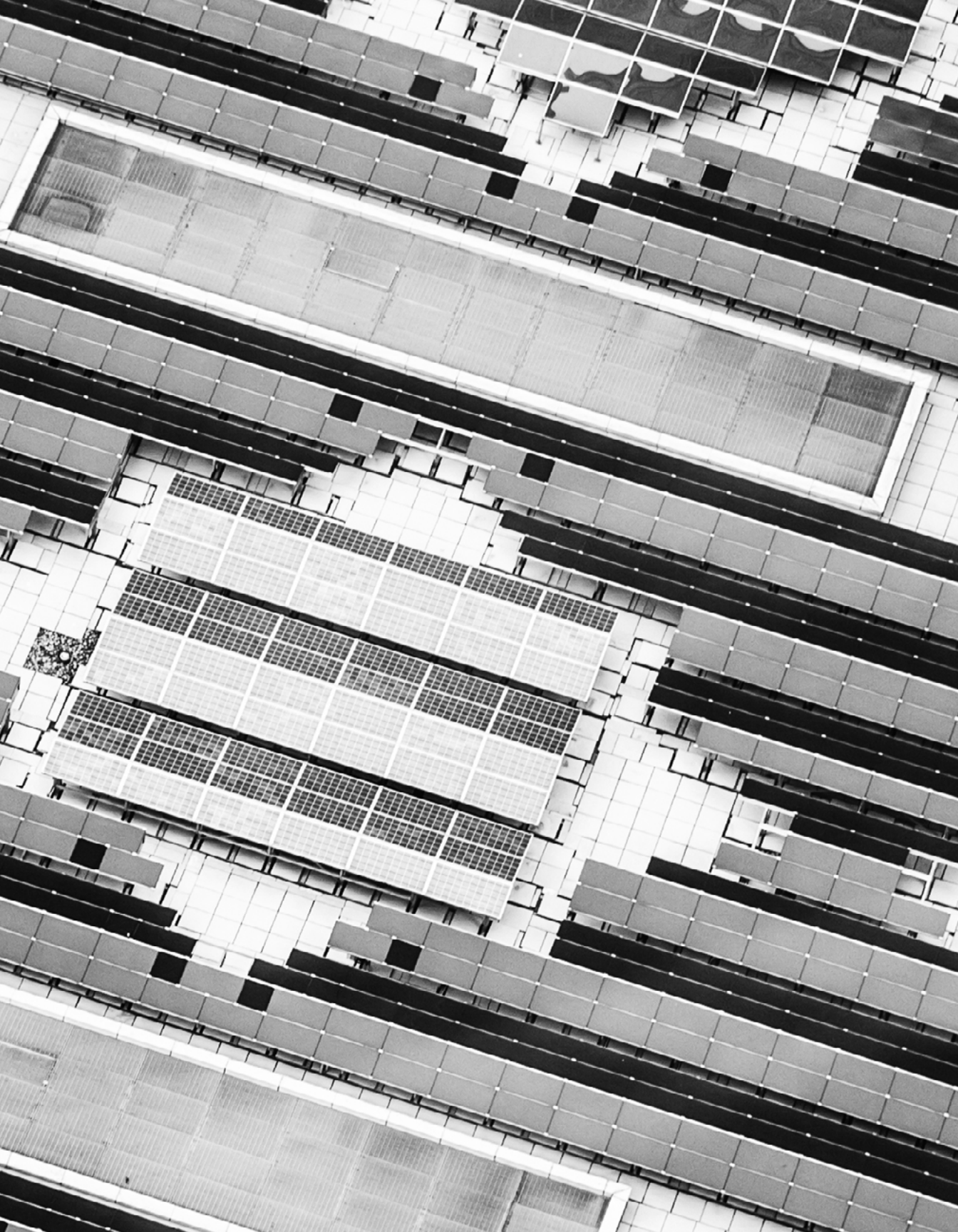
- Although financing of renewable energy has been a priority for climate funding to date, the scale and scope of these efforts remain inadequate. Barriers to wider scale deployment include the policy, regulatory and enabling environment, and the extent to which they incentivize low-emission versus business-as-usual approaches, as well as wider difficulties in raising finance for infrastructure.

- The Fund can take an integrated approach to addressing policy, regulatory, and institutional issues, alongside financing wind and solar technologies that are increasingly cost-competitive but that still confront barriers to deployment.

- The Fund can play a role by financing the deployment of supporting technologies that enable the incorporation of renewables into the energy system, such as storage and smarter grid technology. Storage technologies, combined with renewable energy, are also an opportunity for the Fund to improve off-grid energy access in remote rural areas, providing later the possibility to enhance resilience through improved agricultural practices or water supply using that energy.

- There is a lack of funding to support innovation, including technology research and improvement. The Fund can help by scaling up support for innovations and technological breakthroughs.

- There is also potential for the Fund to increase financing to enable access to cleaner cook stoves and lighting for households and communities, particularly in Asia and Africa, through innovative business and financing models for the poor. This could be achieved through partnerships with specialized businesses and intermediaries with expertise in bundling small- and micro-programmes together, to channel funding to key businesses and enterprises for the greatest impact.



04

GCF in Brief

We are at a critical turning point in the international climate change negotiations. The most recent report from the IPCC is unequivocal in its conclusions about anthropogenic global warming. To keep carbon dioxide equivalent (CO2 eq) concentration in the atmosphere in the 430-530 ppm range until 2100, and to limit global temperature increases to 2°C, requires a massive greening of global investments.

All governments have recognized that resources need to be radically scaled up. The Green Climate Fund was established to act as a central global investment vehicle for climate finance, under which industrialized countries would assist developing countries with new finance for public and private sector projects and programmes.

The human impact we see today in the natural environment of planet earth is unprecedented. Long-term changes in the earth's climate system have been significant and are occurring more rapidly than in the past. According to the Intergovernmental Panel on Climate Change (IPCC), the current trajectory of greenhouse gas emission rates will cause global temperatures to increase by 4°C by the end of this century.

Continued emissions into the earth's atmosphere are projected to cause further warming and increase the likelihood of severe, pervasive, and irreversible effects on every continent.

The Green Climate Fund was established as the central global investment vehicle for climate finance.

In addition, climate change has a disproportionately stronger impact on the lives and livelihoods of those societies which depend on the natural environment for their day-to-day needs.

Responding to this challenge requires collective action from all countries – by actors in both public and private sectors. Among these concerted efforts, advanced economies have formally agreed to jointly mobilize USD 100 billion per year by 2020, from a variety of sources, to address the pressing mitigation and adaptation needs of developing countries. Governments also agreed that a major share of new multilateral, multi-billion dollar funding should be channeled through GCF.

GCF was established by 194 countries party to the UN Framework Convention on Climate Change (UNFCCC) in 2010. It is designed as an operating entity of the Convention's financial mechanism and is headquartered in the Republic of Korea. Its 24 independent Board members receive guidance from the Conference of the Parties to the Convention (COP).

GCF's mission is to achieve a global paradigm shift towards low-emission and climate-resilient development, through its support to developing countries for the curbing of their emissions and adaptation to the unavoidable impacts of climate change within the context of sustainable development.

Resources

Analysis of the Expected Role and Impact of the Green Climate Fund
http://www.greenclimate.fund/boardroom/on-record
Available in Boardroom > Meetings > B.09

IPCC: Working Group II and Working Group III Contributions to the Fifth Assessment Report

Details on the Results Management Framework and the Investment Framework
http://www.greenclimate.fund/ventures/funding/fine-print

For more information on GCF funding, please visit:
http://www.greenclimate.fund/ventures/funding

Did you find this guide useful?

The information presented in this publication will be complemented and revised on an ongoing basis. The Green Climate Fund would appreciate your feedback to help improve the next edition of this publication.

Please send your comments or feedback to **proposals@gcfund.org**

Notes

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