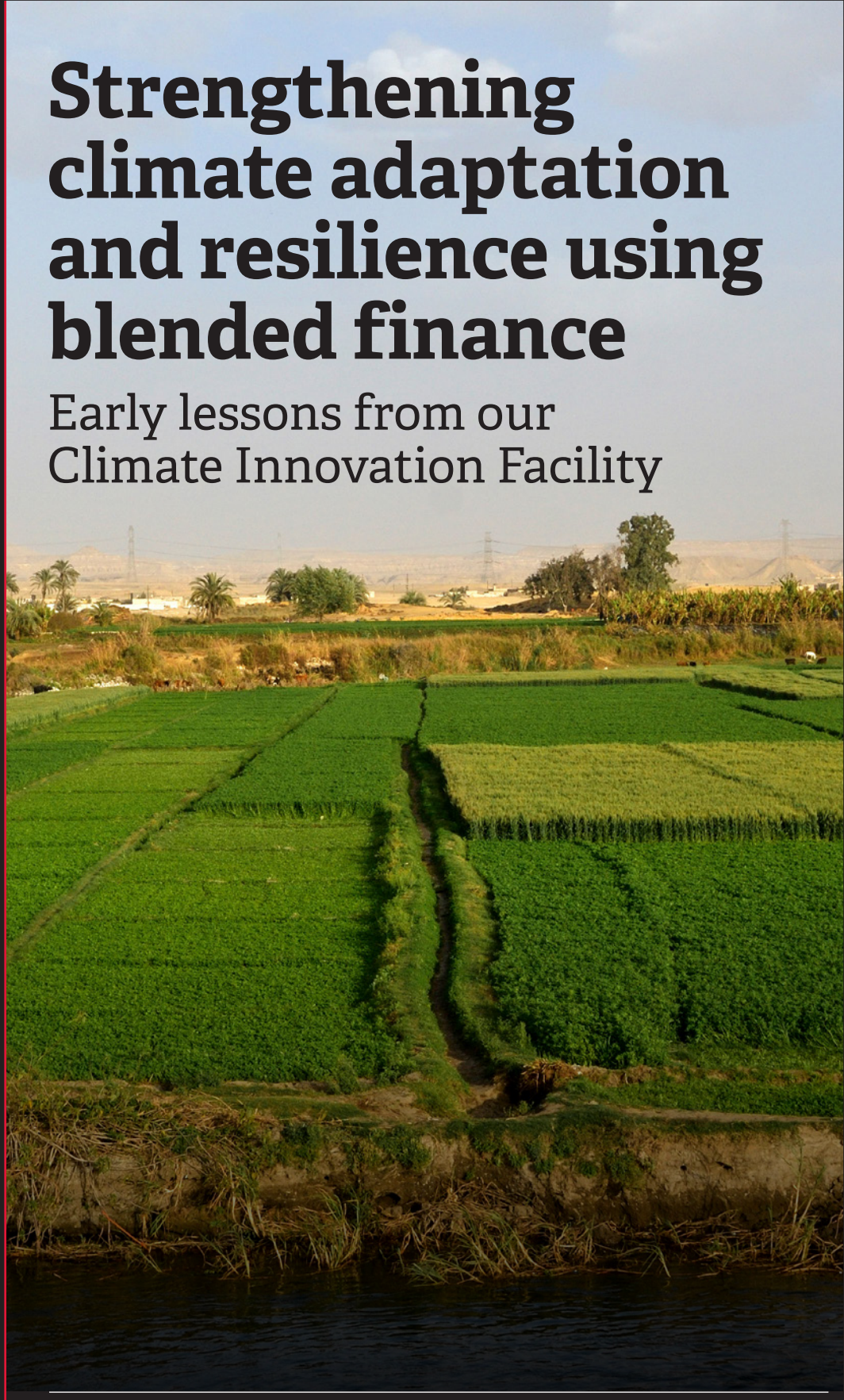
British International Investment

Case study

Insight

Strengthening climate adaptation and resilience using blended finance

Early lessons from our Climate Innovation Facility



Published: October 2025

Case study authors:
Joel Moktar and Adnan N-yo, Wellspring Development

BII leads:
Ayra Jamshad and Clément Bisserbe

Practical thinking on investing for development

Insight is a series of practical and digestible lessons on the issues of private sector investment and development. They're based on our experiences, knowledge and research and are aimed at investors, businesses, development professionals, and anyone with an interest in private sector development.

To view the rest of our Insight series visit:
▸ bii.co.uk/insight

01

Introduction

At British International Investment (BII), we invest in many ways, including direct equity, debt, intermediated investments (funds, for example), guarantees and trade finance. We use these investment products flexibly to maximise impact and meet the diverse needs of our business partners.

Our Climate Innovation Facility (CIF) uses catalytic capital to test, seed, and scale cutting-edge technologies or unproven business models and strategies with the potential for transformational climate impact in Africa, Asia, and the Caribbean. This includes offering debt on flexible terms to help early-stage companies, providing first-loss capital to reduce risk and mobilise private investment into funds, and providing non-recourse loans to support development of infrastructure projects.

Investments made through the facility have a direct impact on people and the planet by reducing greenhouse gas emissions, creating green jobs, and building the resilience of people and businesses. These investments help demonstrate the commercial viability and replicability of climate solutions to other businesses and investors. Through this mandate, the Climate Innovation Facility contributes to our broader Climate Strategy, which targets three impact areas:

1: Net Zero by 2050

Increased avoidance, reduction, and sequestration of greenhouse gas emissions in geographical focus areas.

2: Just Transition

Greater job creation and up-skilling of workers in new low-carbon and resilient sectors.

3: Adaptation and resilience

Sectors, communities, businesses, individuals, and ecosystems are more resilient to climate change effects.

This case study focuses on our investments into technologies, infrastructure, and business models that support climate adaptation and resilience, highlighting some of the barriers and lessons learned across different sectors. We hope these examples can help inform other like-minded investors on similar journeys.

Investments in adaptation and resilience span technologies, products, services, and practices that protect people, supply chains, infrastructure, and ecosystems from extreme weather events, while also safeguarding assets and long-term returns. Climate change *adaptation* approaches focus on preparing for and responding to acute climate shocks, such as extreme weather events including droughts and floods, or chronic pressures like increasing temperatures, sea-level rise, and forest degradation. By contrast, *resilience* approaches aim to increase the capacity of businesses, communities, and people to absorb and recover from the stresses imposed by climate change.

Contents

02

The barriers and opportunities for investing in adaptation and resilience

More frequent climate shocks, such as storms and flooding events, are driving higher losses for industries, businesses, communities, and individuals. In our focus markets, where livelihoods depend on sectors most at-risk to climate change – including the agriculture, forestry, and fisheries sectors – the impacts are disproportionately severe. Rising exposure to physical climate risks is also fuelling demand for infrastructure and technologies which help build resilience for users across a range of sectors, including Water, Sanitation, and Hygiene (WASH), agriculture, and financial services. Yet investments targeting adaptation and resilience receive far less capital than those supporting climate mitigation across the markets where we operate. The UN estimates that developing countries face an adaptation financing gap of $187-359 billion per year.[1]

As adaptation and resilience investments span a range of sectors such as agriculture, energy, manufacturing, transport, and water, many of the barriers to investment are linked to sector-specific risks, gaps, or structural issues. For example, in the markets in which we operate, WASH products and services are viewed as a public good, leaving little scope for commercial investment without heavy subsidies. Novel climate-resilient infrastructure projects that combine investments in hard infrastructure with nature-based solutions can struggle early on due to high project development costs. Similarly, in climate-smart agriculture, the added challenges of reaching 'last mile' farmers and encouraging changes in farming practices raises investment risk further.

Some barriers cut across all sectors. For nascent technologies and infrastructure, uncertainty about commercial viability typically increases investment risk, either because the technology is unproven within a specific market, or because there is little data on customer ability or willingness to pay. The challenge of measuring adaptation and resilience impact outcomes can also deter investors, who often favour mitigation opportunities with clearer impact metrics, such as CO_2 emissions avoided. Also, investment opportunities in this space are often too small to invest in directly, narrowing the pipeline of deals for direct debt and equity investment. This issue is compounded by the limited number of funds with credible adaptation-oriented investment strategies in emerging markets.

Despite these barriers, investing in adaptation and resilience is a significant untapped opportunity for investors in emerging markets. Commercially, rising demand driven by intensifying climate impacts is expanding the market for well-designed technologies and solutions. Linked to this, the level of policy and regulatory support – including subsidies and tax incentives – is likely to increase as countries ramp up support for climate-related shocks. From an impact perspective, these investments can be highly cost-effective, with relatively small investments resulting in high impact per capita. In the short to medium-term, blended finance can play a vital role in proving the viability of new climate technologies and services, and attracting private investment.

$187–359 billion

annual adaptation financing gap

1 UNEP (2024) Adaptation Gap Report.

03

How blended finance can scale up investment in adaptation and resilience

Blended finance can help address the current funding gap by making project risk-return profiles feasible for varied investors. But because catalytic capital is scarce, it must be targeted carefully to sustainably attract private sector capital. Across our markets, the Climate Innovation Facility has helped us to lower the risk profile of deals using a comprehensive toolkit.

- Our **flexible debt product** lets businesses test innovative early-stage climate technologies or services. By offering flexibility on pricing, tenors and repayment terms, and using structures such as convertible or hybrid debt, we have helped businesses to raise non-dilutive capital and keep technologies and services affordable for customers until they achieve economies of scale. This flexible debt has also helped businesses pilot new financing approaches, such as prefinancing carbon credits that create additional revenue streams.
- Our **credit enhancement** product helps to de-risk and crowd-in other investors. By taking junior or first-loss positions in adaptation and resilience focused strategies, we help mobilise commercial investor participation. This approach also means that Climate Innovation Facility capital can reach smaller adaptation opportunities that we would not be able to back directly.
- Our **project development loans** support early-stage and innovative infrastructure projects such as coastal resilience, green ammonia production, water supply, and sanitation. These projects often face high upfront costs for feasibility studies, environmental, social and governance (ESG) assessments, and legal advice. We help cover these costs by providing non-recourse loans to fund project development costs where risks remain high and financial close uncertain, with repayment only due after projects reach financial close.

The next section shares examples of how these blended finance instruments are being used to unlock adaptation and resilience investments.

04

Insights from investments

Investing with flexible debt into climate-smart agriculture projects
SunCulture and Grow Indigo

The sector

Climate-smart agriculture brings together technologies and practices that make food systems more productive and resilient, while also supporting nature through biodiversity conservation, healthier soils, and improved water management. These practices can increase agricultural productivity and incomes, strengthen resilience to extreme weather, and lower greenhouse gas emissions. Examples include drought or flood-resistant crop varieties, regenerative agriculture techniques such as no-till farming and crop rotation, and integrated agroforestry approaches. Resource-efficient technologies like precision irrigation and targeted fertiliser application also play a key role.

The challenge

Several barriers limit commercial capital from reaching climate-smart agriculture projects at scale. Many solutions rely on significant behaviour change among smallholder farmers, heightening execution and adoption risks. Affordability is another challenge: smallholder farmers often operate on tight margins and have limited capital, making it hard to pay upfront for new technologies or services even when they offer long-term benefits. Many climate-smart technologies, such as small-scale cooling and solar power irrigation pumps, are still at an early stage or rely on emerging or unproven financial models like pay-as-you-go microcredit models[2] or carbon credits. Limited data on performance and reliability adds further uncertainty for investors, slowing the uptake by both farmers and agribusiness.

1.5–3 tonnes

of CO_2 emissions avoided per pump per year (SunCulture)

2x

farmer yield increases reported (SunCulture)

2 Financing plans for low-income customers that enable them to access to a product or service on credit, with an initial downpayment and then subsequent repayments made in small instalments.

SunCulture

The solution

Kenya-based SunCulture helps smallholder farmers adapt to drought and water shortages by supplying them with solar-powered irrigation pumps. By replacing diesel pumps, its irrigation products also cut greenhouse gas emissions. Access to irrigation pumps makes farmers more resilient to climate shocks, reducing their reliance on rain-fed systems and shared surface water, by giving them the means to draw water from underground water tables.

Because solar irrigation pumps cost around $600, most smallholder farmers buy them through a pay-as-you-go model. Even so, affordability is still a key constraint. To help address this, SunCulture generates carbon credits from the solar-powered pumps it sells, which replace fuel pumps and reduce carbon emissions. With support from our flexible debt, SunCulture has lowered irrigation pump prices for smallholder farmers by using expected revenues from carbon credits. SunCulture is also exploring selling carbon credits in the compliance carbon market, where credits can be traded at larger volumes and higher prices.

The role of our blended finance

Through the Climate Innovation Facility, we provided SunCulture with an initial $2 million loan and follow-on $4 million loan to pilot its carbon credit model at scale. Our financing has helped SunCulture to use future carbon credit revenues to lower pump prices for farmers. Before these loans, SunCulture could not access comparable funding because of long payback periods and price volatility in the voluntary carbon market. By offering SunCulture its first carbon credit pre-financing, we helped close a funding gap that had prevented it from reaching lower-income farmers who most need support to adapt to climate shocks.

Adaptation and resilience impact

By shifting farmers from diesel pumps to solar irrigation, SunCulture has helped avoid 1.5–3 tonnes of CO_2 emissions per pump per year. SunCulture has distributed more than 18,000 discounted units to farmers across Kenya since disbursement of our initial loan, cutting average prices by 17–25 per cent and reaching more low-income farmers.

Farmers have reported yields doubling since buying SunCulture's irrigation pumps. After the pilot, SunCulture sold carbon credits at an average price of $18–$25, exceeding the target price set at the time of investment and showing that credits with social co-benefits, such as farmer resilience, can command a premium.

Because of SunCulture, I can water my plants even at night…Because now the costs have gone down drastically, and I can now say I am getting something from the shamba [farm] as profit.

Fidelis
Farmer in Katheka, Kenya

Grow Indigo

The solution

Grow Indigo, founded by Mahyco and Indigo Ag, is helping smallholder farmers in India to transition towards regenerative agricultural practices across rice, wheat, maize, sugarcane, and cotton. Like SunCulture, Grow Indigo is using carbon markets to drive agricultural change. With our upfront investment, Grow Indigo will support farmers to adopt regenerative agricultural practices such as direct seeding of rice and no till farming. The company will track the impact of these changes on soil carbon and emissions and then issue and sell carbon credits in the voluntary carbon market. Revenue from these sales will cover programme costs (including farmer incentives) and support repayment of our investment.

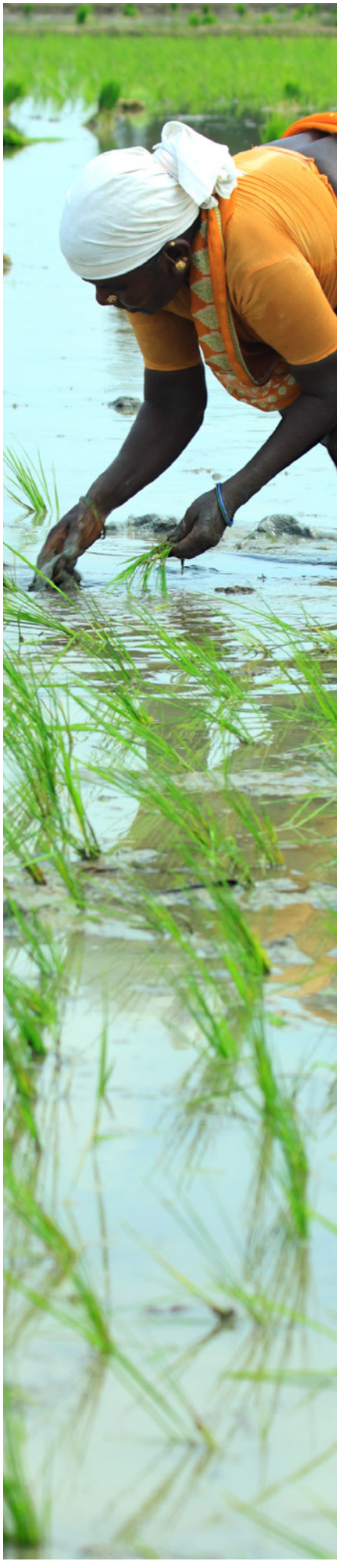
While carbon credit revenues encourage farmers to join Grow Indigo's programme, longer-term benefits are expected to sustain their participation. These include higher yields and incomes, health improvements from reduced exposure to water-borne disease and less physical strain, and greater resilience to droughts and floods. Grow Indigo's model can help more smallholder farmers adopt regenerative practices, while showing that climate-smart agriculture models linked to carbon markets are commercially viable.

The role of our blended finance

Our $9.85 million climate debt facility (₹830 million) was Grow Indigo's first external capital and funded the expansion of its regenerative agriculture carbon programme for smallholder farmers. The project aims to cut emissions from rice, wheat, cotton, sugarcane and maize production across 13 states in India. With the Climate Innovation Facility's support, Grow Indigo has scaled up its projects at a time when adoption of regenerative agricultural practices among farmers in India remains limited. Ultimately, the investment is designed to prove the viability of its carbon credit model and attract other investors into similar projects.

Adaptation and resilience impact

Although still at an early stage, Grow Indigo is expected to reach 191,000 new farmers within two years through the expansion of its carbon projects. The practices it promotes align with India's National Action Plan on Climate Change (NAPCC), which prioritises climate-smart farming such as reducing soil erosion and promoting nutrient management. By supporting regenerative farming practices, the project should help protect farmers from worsening environmental risks, improve soil quality and strengthen food security through higher yields and incomes. If adopted correctly, no till and direct-seeded rice practices could raise yields by ~10 per cent per hectare.



191,000

farmers expected to be onboarded

~10%

per hectare yield improvements anticipated

Using credit enhancement to de-risk climate insurance investments
BlueOrchard InsuResilience Investment Fund II

The sector

Climate risk insurance helps households and businesses cope with extreme weather by providing payouts when floods, droughts, or other climate shocks occur. These payments replace lost income, such as when farmers lose crops or businesses see goods damaged.

The challenge

Climate insurance is still at an early stage, even though it is critical for the climate transition. The sector struggles to balance affordable premiums with products that meet policyholders' needs, partly because insurers lack reliable data to price climate risk accurately. In underserved markets, the challenge is greater. Vulnerable populations are often spread across wide areas, making it costly to engage with them and distribution insurance products.

On the demand side, households and businesses in underserved markets often hesitate to adopt climate insurance because they do not trust insurers or are unfamiliar with the products. This lack of familiarity means insurers rarely sell climate insurance on its own, instead bundling it with better-known products such as theft insurance. These barriers make it harder for insurers to reach vulnerable groups, including smallholder farmers and micro, small and medium-sized enterprises (MSMEs).

The solution

Impact investor BlueOrchard manages the $100 million InsuResilience Investment Fund II[3], which provides equity to climate insurance companies. BlueOrchard's investments along the climate insurance value chain contribute towards improving the supply and demand of climate insurance in emerging markets, where households and businesses remain underserved and poorly prepared for extreme weather. The fund helps climate insurance companies pilot new products and expand their reach by working with aggregators such as financial services companies and agricultural input suppliers. This widens distribution and lowers insurance costs. A Grant Facility[4] has also been set up to provide technical assistance to the companies the fund supports to help test new products, refine delivery models, and improve customers' insurance and financial literacy.

3 The fund achieved its target size in December 2024 (final closing) and is now not open to new investments.
4 Funded by BMZ and NDF.

The role of our blended finance

The Climate Innovation Facility has helped channel investment into the InsuResilience Investment Fund II, which uses a two-tier blended finance structure. Senior investors get priority on returns, while junior investors take the first loss, providing loss protection for senior investors. Through this structure, we have provided $2.25 million to the first loss share class, helping to maintain sufficient security for senior investors. In parallel, we invested a further $14.75 million in the fund's senior investment share class on more commercial terms.

As well as attracting private sector investors, our capital helped BlueOrchard to take on more risk and back in innovative climate insurance products and distribution models with the potential for significant adaptation and resilience impact.

Adaptation and resilience impact

Since closing, BlueOrchard's InsuResilience Investment Fund II has invested in nine companies across the climate insurance value chain. These investments include subsidising low-cost business insurance for MSMEs in India and expanding access to life and climate insurance for individuals and MSMEs exposed to floods and droughts in Ghana. The fund has also a supported 'gender-smart climate finance investment' that insures women farmers against extreme weather events. Through its portfolio companies, the fund has so far given 4.3 million households and MSMEs access to insurance, reaching 18.2 million people (individuals and employees)[5] and strengthening their resilience to climate-related shocks.

18.2 million

people reached

5 BlueOrchard InsuResilience Investment Fund Quarterly Report, Q2 2025.

Supporting climate-resilient infrastructure with project development loans

The Urban Resilience Fund (TURF) Nouakchott, Mauritania

The sector

Climate-resilient infrastructure is specifically designed to withstand the physical risks posed by climate change. Hard infrastructure includes sea walls or drainage systems to reduce flood risk, or solar mini grids to provide power during extreme weather. Soft infrastructure covers the rules and frameworks that guide communities, such as early warning systems and disaster risk reduction policies. Together, these measures reduce vulnerability to climate shocks and help protect lives and livelihoods.

The challenge

Investment in climate-resilient infrastructure remains limited, partly because such projects are often seen as public goods. This makes it harder for developers to identify reliable revenue streams that show clear financial returns for investors. Valuing resilience is another challenge: benefits such as reduced flood risk or improved land value are difficult to measure in financial terms, complicating both project valuation and investor underwriting. High upfront costs for feasibility studies, often requiring expertise in engineering, law, and urban planning, further deter early-stage development and investment. As a result, many projects struggle to show bankability without targeted, risk-tolerant capital. In Africa, this is a major bottleneck, with around 80 per cent of infrastructure projects failing at the feasibility or business plan stage.[6]

The solution

Meridiam, an established infrastructure fund manager, manages The Urban Resilience Fund (TURF), which develops pioneering urban resilience projects in African cities, with the aim of encouraging wider replication. One flagship project, created with the Government of Mauritania through a public-private company, addresses the coastal flooding and rising sea levels in Nouakchott. The city faces increasing flood risk from the erosion of the natural dune barrier separating the city from the ocean. The project developed by Meridiam combines reinforcing and vegetating the dune belt, with improved rainwater drainage systems. As well as protecting the city, the project will enhance the coastline, creating new recreational areas, residential areas, urban green spaces and commercial spaces. These features have strengthened the case for investment by generating potential returns, including lease income from new facilities.

The role of our blended finance

We are using the Climate Innovation Facility to provide a project development loan to support feasibility studies for the Nouakchott coastal resilience project. This early-stage financing lowers the overall cost of capital, enabling the project to move forward with greater confidence in its commercial potential. By de-risking this critical development phase, blended finance also creates stronger incentives for developers to design and test innovative climate infrastructure. If successful, the project could generate valuable lessons and demonstrate the viability of climate-resilient infrastructure projects across Africa, helping to build a stronger pipeline of commercially attractive adaptation projects.

6 McKinsey & Company (2020): 'Solving Africa's infrastructure paradox'.

Adaptation and resilience impact

Between 2000 and 2021, Mauritania was the third worst-affected country in sub-Saharan African in terms of the human impact of climate-related events.[7] Nouakchott, home to more than half the country's urban population, is particularly exposed, with nearly half of the city below sea level. The coastal resilience project aims to protect the city from dune erosion, flooding, and marine submersion. These measures are also expected to boost economic activity in the area by reducing the economic cost of climate shocks and creating jobs through new coastal businesses such as fish markets, hotels, and restaurants, in line with local and national development plans.

7 World Bank (2023): 2023 Economic Update on Mauritania

05

Key takeaways

Climate adaptation and resilience remains central to our Climate Strategy and is a priority for the Climate Innovation Facility. While our investments are still at early stage, they offer valuable insights into how blended finance and catalytic capital can scale up adaptation finance and strengthen resilience to climate change effects in emerging markets:

Blended finance can be used to unlock adaptation finance using tailored, sector-specific approaches

Opportunities for adaptation and resilience exist across many sectors, and the barriers to investment often differ by sector. The key is to identify the barriers to commercial investment and use the appropriate blended finance product to overcome them.

Carbon credits can provide complementary revenue streams for adaptation and resilience projects

Our investment in SunCulture shows that high integrity climate adaptation projects that directly benefit farmers can also generate substantial carbon credit revenues. These revenues can then be used to unlock new impact models. There is also scope to use catalytic capital to pre-finance carbon credits for other adaptation and resilience projects.

Financing developer costs can help unlock opportunities in climate-resilient infrastructure

Novel climate-resilient infrastructure projects such as TURF Nouakchott can deliver economic benefits and reduce losses. Catalytic capital can cover early project development costs, speed up proof of concept and lead to replication.

For further information:

- **British International Investment:**
  Ayra Jamshad
  ajamshad@bii.co.uk
  bii.co.uk/insight

British International Investment

Supported by:

wellspring