Private Adaptation Finance

Impact Investing for Climate Change Adaptation: an Introduction

Context

Many parts of the world have experienced record-setting heatwaves, floods, droughts, storms and wildfires in the past years. As such events happen with increasing frequency and severity, they imply significant economic and social costs to societies globally. They also give an indication of the potential future social, economic, geopolitical, and environmental disruptions of climate change. Responding to these current and expected future trends, **a growing number of companies, including SMEs in developed and developing countries, offer products and services that support their customers to adapt to climate change.** Other companies adapt their internal operations, for example agricultural practices in a way that leads to significant climate change adaptation benefits. Under these circumstances, **the market for climate change adaptation solutions is expected to double within the coming 5 years.**[1] However, while climate change adaptation has been an important topic for the development finance community for a number of years, awareness of private investment opportunities is still limited.

Using climate and weather services for climate-resilient agriculture

Climate change adaptation is likely to become an increasingly relevant issue for impact investors, especially for investments in developing countries, **as climate change may push up to 130 million people into poverty over the next 10 years,**[2] **thus unravelling hard-won development gains.** Against this backdrop, climate change adaptation becomes increasingly important for preserving livelihoods. At the same time, companies in developing countries, that address climate change adaptation, especially start-ups and growth-stage companies, struggle with access to capital, with investment readiness, and with expertise for strengthening the adaptation relevance of their business model and communicating climate change adaptation impacts to clients and investors.

This primer provides an **introduction to climate change adaptation, its relevance for impact investors and how the issue can be addressed in investment strategies.** The focus lies on investment opportunities in SMEs and growth stage companies in developing countries and emerging markets. At the same time, much of the analytical framework is applicable to developed markets as well, for example how to identify adaptation-relevant business models.

Defining climate change adaptation

Whereas climate change mitigation deals with the causes of climate change, predominantly through reducing greenhouse gas (GHG) emissions, climate change adaptation addresses the impacts of climate change. It does so predominantly through reducing economic and human losses from climate impacts and increasing the resilience of communities, economic activities and ecosystems to climate change. According to the United Nations Framework Convention on Climate Change (UNFCCC) climate change adaptation refers *"to **changes in (ecological, social, or economic) processes, practices, and structures to moderate potential damages** or to **benefit from opportunities associated with climate change.**"*

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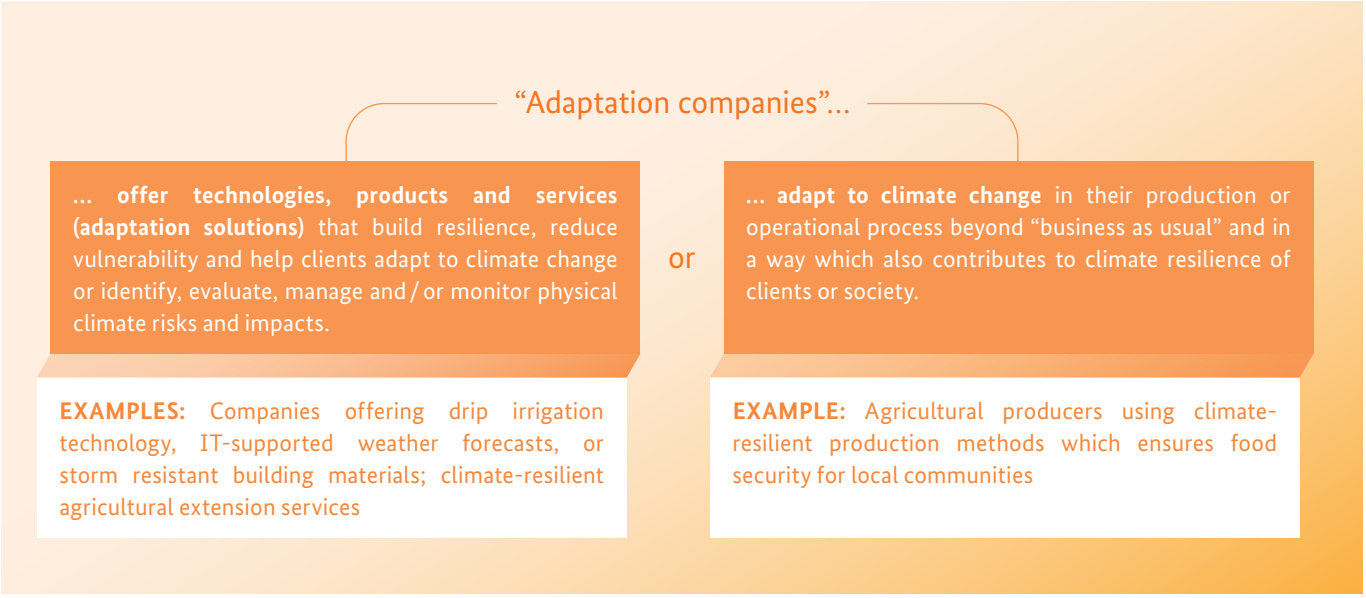

Figure 1: Two ways how companies can generate climate change adaptation impacts

Typical examples of climate change adaptation interventions are the use of drought tolerant agricultural crops and climate-resilient agricultural production practices, improved weather and disaster forecasts, water efficient industrial production, climate-proofing of infrastructure investments or the building of dams and sea walls. Figure 1 demonstrates how companies may generate climate change adaptation and resilience benefits. Box 1 describes examples of adaptation solution companies across different sectors and geographies.

In a world where, even with rapid and sustained reduction in greenhouse gas emissions, climate change impacts are projected to accelerate and intensify, **climate change adaptation and mitigation need to complement each other.** Some economic activities even have both climate change adaptation and mitigation benefits. Certain sustainable agricultural practices for example, make agricultural production more resistant to prolonged periods of drought and increase the amount of carbon stored in the soil.

Whilst, driven by the prominence of renewable energy technologies, awareness on investment opportunities for climate change mitigation is relatively high, there **is less understanding of investment opportunities in climate change adaptation and resilience.**

Box 1: Companies offering adaptation solutions across a range of sectors and geographies

US-based **Cloud to Street** offers satellite-based flood tracking solutions that improve flood disaster response. The company aims to enable communities to prepare and respond to climate disasters by reducing the barriers to scientific information and capital.

Uzima Chicken, a poultry business supplying fast-growing, highly productive, and highly resilient day-old chicks, feed, vaccines, and training to smallholder farmers in Uganda, Rwanda, Burundi and Kenya. Its chicken breed is highly disease resistant, more productive for eggs and meat as compared to indigenous breeds, and highly adaptable to humid and dry conditions. It helps smallholder farmers to increase and diversify their incomes and improve their resilience to climate change.

Nigeria based **Arctic Infrastructure** provides support to public and private institutions in planning, designing, implementing, and mobilizing finance for innovative urban climate-resilient infrastructure in the cities of Sub-Saharan Africa. Services include the integration of nature-based solutions into infrastructure and urban spaces to make them more resilient to climate change impacts.

US-based **SOURCE Global** owns and distributes the SOURCE® Hydropanel, a one-of-a-kind renewable water technology that uses the power of the sun to extract clean, pollutant-free drinking water from the air. The technology is applied in 50 countries worldwide, ensuring access to drinking water even in situations of water scarcity.

Nigeria-based **Koolbox** has developed a solar-powered cooling system which it distributes to residential, commercial and health-care customers. Refrigeration reduces food waste thus improving food-security including in a context of climate change induced falling agricultural yields. Solar-powered cooling solutions also improves access to health care including during natural disasters.

India-based **Kheyti** provides farmers with a "greenhouse in a box" solution, a package of greenhouse and irrigation technology, finance, training and access to markets. This allows farmers to grow crops with significantly less water and more resilience to changing climate conditions, along with improving incomes.

Market growth of adaptation solutions and investment funds

Market opportunities for "adaptation companies" are expected to grow significantly in the coming years. In its latest Adaptation Gap report, the UN Environment Programme estimates that annual adaptation costs in developing countries will be US$ 140–300 billion by 2030 and US$ 280–500 billion by 2050, with cost estimates increasing over time as climate impacts accelerate and intensify. Financial losses from extreme weather events, such as floods, heatwaves and droughts alone, are estimated to increase by 20% by 2040 due to climate change. Whilst reported losses stand at an average of around $ 195 billion a year in direct costs today, they may increase to $ 234 billion a year at today's values by 2040.[3]

Analysts at Bank of America estimate that the global climate adaptation market will double to $ 2 trillion a year in the course of the next five years.[4] These global predictions are in line with market trends for specific adaptation technologies. The market for drought tolerant seeds, for example, is projected to grow by more than 50% between 2020 and 2028.[5] The market for drip irrigation technologies is expected to grow by more than 60% in the coming 5 years, especially in Asia and the MENA region.[6]

The fact that climate change impacts are likely to be felt faster, more widespread and more severe than most people expect, and the resulting increase in awareness and a willingness to invest in adaptation and resilience, will likely lead to further market growth for adaptation solutions. As a matter of fact, the market for climate change adaptation solutions is less dependent on policy interventions than the market for many climate change mitigation technologies.

Emergence of impact funds with climate change adaptation focus

For many years, climate change adaptation has been considered mostly a public task supported by predominantly public funds. Investments were typically into adaptation projects. **Today, a growing number of impact investors are starting to offer specific investment products that provide finance to "adaptation companies".** Often these funds invest in developing countries and emerging markets. They tend to either have a sectoral focus on agriculture and rural development or invest in adaptation solutions across various sectors. Box 2 describes examples of such investment funds, demonstrating that there are tangible opportunities for impact investors.

Box 2: Impact investment funds focusing on climate change adaptation

The **Lightsmith Climate Resilience Fund** managed by the Lightsmith Group is the first private equity fund focusing on climate resilience and adaptation by investing in growth-stage technology companies that address the effects of climate change. It had its final closing in January 2022 with $186 million of commitments by, inter alia, the Green Climate Fund ("GCF"), European Investment Bank, Asian Infrastructure Investment Bank, KfW on behalf of the German Ministry for Economic Cooperation and Development (BMZ), the PNC Insurance Group, The Rockefeller Foundation, Kinneret Group, and Caprock Impact Partners. The fund focuses on six initial technology areas: water efficiency and smart water management, resilient food systems, agricultural analytics, geospatial intelligence, supply chain analytics, and catastrophe risk modeling and risk transfer.

Mercy Corps Ventures invests in and catalyses venture-led solutions to increase the resilience of underserved individuals and communities. Founded in 2015 as the impact investing arm of global development agency, Mercy Corps, they have supported 38 early-stage ventures to scale and raise over $333 million in follow-on capital. The portfolio centres around resilience-building solutions in adaptive agriculture and food systems, inclusive fintech, and climate smart systems in frontier markets. Through capital and support, piloting new approaches, and rigorously managing impact, they catalyze the ecosystem towards smarter, more impactful investments.

The **Acumen Resilient Agriculture Fund (ARAF)** managed by Acumen Capital Partners provides equity and quasi-equity capital to support African agribusinesses that help smallholder farmers adapt to climate change. Sponsored by Acumen, anchored by the Green Climate Fund (GCF), and with investments from the Dutch entrepreneurial development bank (FMO), PROPARCO, the Soros Economic Development Fund (SDEF), the Children's Investment Fund Foundation, and other investors and funders, the fund closed in June 2021 with $58 million.

Root Capital invests in the growth of agricultural enterprises that are building a more prosperous, inclusive, and resilient future for rural communities by providing credit and capacity building. They aim to increase rural livelihoods, create jobs for young people, level the playing field for women, and help farmers adapt to climate change. To date, Root Capital has disbursed over $1.6 billion to improve the livelihoods and resilience of 10 million people. 40% of their funding comes from foundations, 44% from individuals, and the remainder from public and corporate sources.

The **Landscape Resilience Fund (LRF)** is an impact-driven, independent foundation that mobilizes private climate finance for vulnerable smallholders and landscapes, co-developed by South Pole and the World Wide Fund for Nature (WWF). With a $25 million commitment from anchor investor Chanel, and a grant from the Global Environment Facility for pre-investment support, the LRF provides investment, soft loans, and technical training to adaptation-focused SMEs and projects to give them better access to private return-seeking investors. The LRF is managed by South Pole; WWF acts as an advisor and service provider.

Oryx Impact is a fund-of-funds investor using climate change adaptation as one criterion amongst others to identify funds that support sustainable development in Africa.

To build awareness and capacity at the intersection of climate resilience and investment, in parallel to the launch of funds, several international working groups, such as the Global Adaptation and Resilience Investment Working Group (GARI), convene private and public sector investors, bankers, lenders and other stakeholders interested in adaptation investments.

Opportunities for using development finance for risk coverage and technical assistance

Some of the existing vehicles are **blended finance funds, which strategically use development finance to mobilize additional finance towards sustainable development,** in this case climate change adaptation in developing countries.[7] The Lightsmith Climate Resilience Fund and the Acumen Resilient Agriculture Fund (ARAF), for example, received equity and – in case of ARAF – grant funding from the Green Climate Fund. Both funds deploy a layered capital structure. The GCF and other anchor investors fund a junior tranche that mitigates downside risk for senior tranche investors, with the aim of mobilizing non-concessional and private investments. In the case of ARAF, both tiers of capital share profits on a pro-rata basis.[8] The Lightsmith Climate Resilience Fund will distribute profits according to a waterfall structure laid out in the fund's Limited Partnership Agreement.[9] Such structures are typical for blended finance equity funds.[10]

The use of these blended finance approaches provides **risk coverage for non-concessional and private investors.** It can also be suitable for situations where **investments into adaptation create both private and public benefits,** and are not financially viable on purely commercial terms.[11]

Blended finance funds also often deploy development finance for technical assistance facilities providing assistance to investee companies and potentially for building the ecosystem for climate adaptation investments. Blended finance structures may also leverage the expertise of the development finance community which has been dealing with climate change adaptation for many years, e.g., in the area of measuring adaptation impacts and building the business case for private investments into climate change adaptation. At the same time, the use of development finance in impact funds may increase administrative and reporting requirements.

Development finance and impact-first philanthropic funders also play an important role in supporting ecosystem building, pipeline development and incubation of start-ups. Incubator and accelerator initiatives supporting companies active in climate change adaptation include the Private Adaptation Investment Bootcamp (PrivABoo) implemented by GIZ, Triggering Exponential Climate Action (TECA) implemented by BFA Global and FSD Africa, the Adaptation SME Accelerator Project (ASAP) implemented by the Lightsmith Group, the Climate Resilient Agriculture Accelerator by Acumen in India, and the Adaptation and Resilience Challenge and Accelerator implemented by EIT Climate-KIC.

Adaptation portfolio screening as a first step to integrate climate change adaptation into investment strategies

For smaller impact investors including foundations and family offices, who already manage a portfolio of companies in sectors with tangible climate impacts or with potential climate change adaptation solutions, **an adaptation portfolio screening can be a straight-forward first step to addressing climate change adaptation in their investment strategy.** The portfolio screening may serve to:

- familiarize investment staff with the topic,
- provide a basis for reporting on adaptation impacts to investors and
- support investee companies in strengthening their adaptation business cases.

Green roofs reduce the urban heat island effect by lowering the city's temperatures and therefore reducing the need for air conditioning.

The following presents a 2-step methodology for an adaptation portfolio screening:

STEP 1: DETERMINING CLIMATE IMPACTS AND RISKS

- Determine **climate change impacts** in the country / region where an investee company is active, such as prolonged periods of drought, sea level rise, more frequent strong rainfall etc.
- Determine **climate change risks and vulnerabilities** in the company's target (sub-)**sector** or population, such as risks to food security, damage to houses and other infrastructure etc.

STEP 2: ANALYSE ADAPTATION RELEVANCE OF A COMPANY'S BUSINESS MODEL

- **Evaluate whether the company's business model has an adaptation relevance.** Namely if the company...
  - **... offers adaptation solutions,** namely technologies, products, services, knowledge solutions that help the company's clients to adapt to the specific climate change impacts, risks and vulnerabilities identified in step 1, or
  - **... applies adaptation solutions** (e.g., technologies, alternative or adjusted production processes, alternative crops etc.) in their business practices in a way that addresses or reduces the specific climate impacts, risks and vulnerabilities identified for the region and sector, and increases climate resilience of clients or the society at large. This should go beyond "business as usual" changes driven by short-term climate impacts and risks. It may include applying new and innovative technologies, significant adjustments to existing agricultural production practices etc.

Overview tables with adaptation solutions such as Figure 2 may be useful for identifying whether a company's technology, product or service **is likely to have climate change adaptation benefits.** However, an **analytically robust assessment should be based on the projected climate change impacts in the specific region.** This is because climate impacts and, consequently, suitable solutions for climate change adaptation and resilience vary. For many regions, climate models predict, for example, decreasing rainfall and higher probabilities for droughts; in some countries, an increase in rainfall is projected or significant changes in the temporal distribution which affects the suitability of agricultural practices in that region.

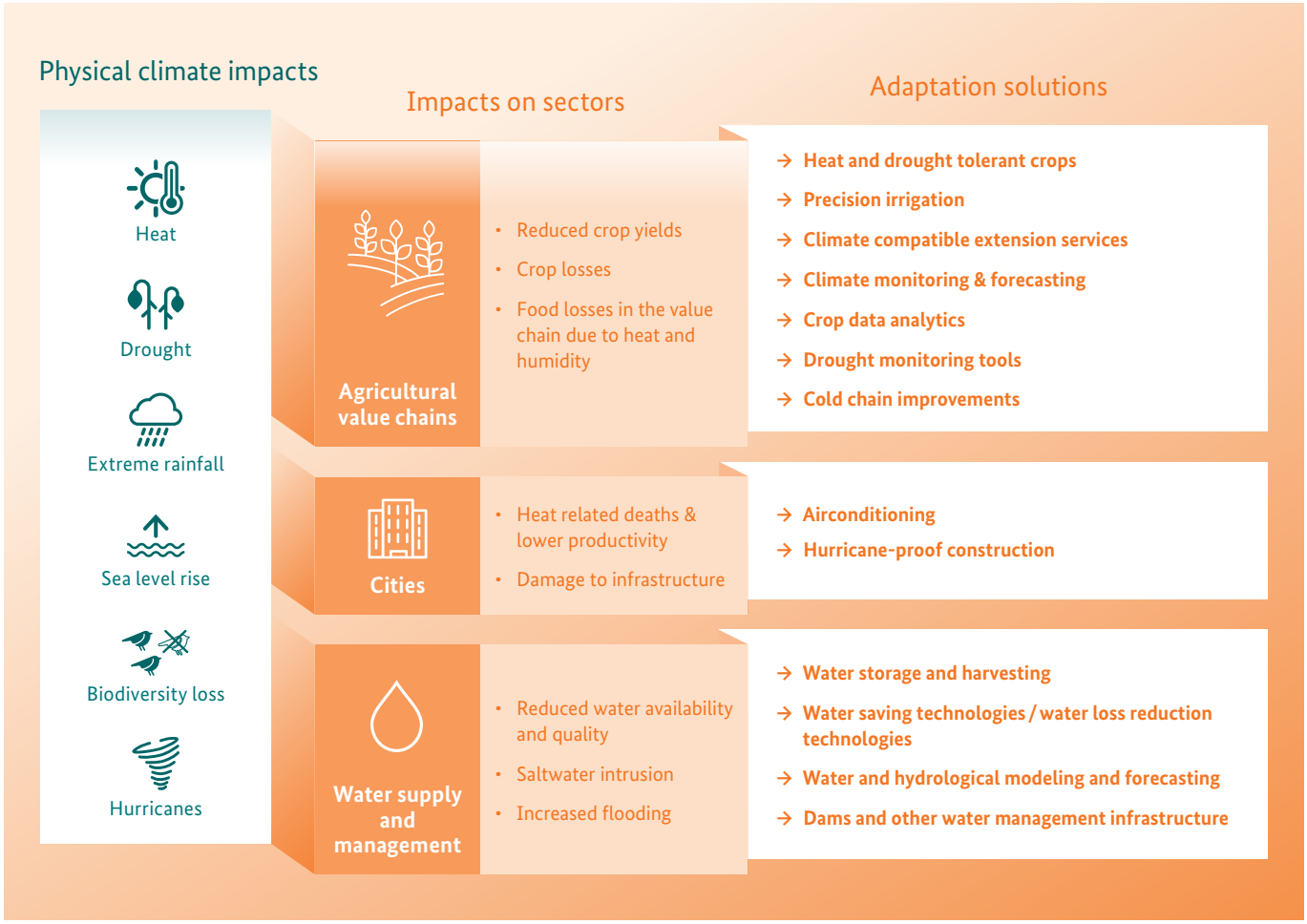

Figure 2: Schematic approach depicting key adaptation solutions in selected sectors[12]

Measuring adaptation impacts

As climate change adaptation may take place in a broad range of sectors and touches on different aspects of people's livelihoods, there is no one-size fits all measurement framework. Moreover, measuring adaptation impacts can also be challenging in situations where climate change impacts only manifest over longer time spans. A typical cross-sectoral indicator used frequently for development cooperation project is:

> **Total number of people benefitting from access to adaptation solutions and / or from the adoption of diversified, climate-resilient livelihood options** (for example in agriculture, tourism, etc.)

However, this generic indicator lacks context specific elements on how the adaptation impact is generated. To be more specific in tracking the latter, **sector-specific indicators relating to the adaptation logic of the intervention** can be used (see Table 1 for examples).[13] The Acumen Resilient Agriculture Fund undertakes surveys on wellbeing and climate resilience of the farmers that benefit from the technologies and services offered by the fund's investee companies. This approach can be even more precise than sector-specific indicators in determining the fund's adaptation impact, but is also resource intensive.

Indicator	Adaptation relevance
% of farmland covered by crop insurance	Crop insurance mechanisms against climate risks can help farmers cope with the negative impacts of climate hazards.
# of cubic meters of water conserved	Climate change puts additional pressures on water resources; investing in water-saving technologies across all sectors and uses in regions at risk for water shortages, supports climate adaptation.
# of tons of food waste avoided	Companies that offer cold storage solutions for agricultural supply chains may improve climate resilience through improving food security in areas where food production is at risk from climate change.
Increase in the % of climate resilient crops being used	Drought and flood resistant crops can help farmers adapt to a changing climate.
% of additional fodder for grazing livestock	In situations in which grazing no longer provides sufficient fodder due to unfavorable weather conditions, building food reserves for livestock increases climate resilience.
% of households at reduced flood risk due to new or enhanced flood defenses	Construction of flood defenses can minimize the negative impacts of floods on properties in the context of climate change.
Turnover generated by agricultural cooperatives	The turnover of agricultural cooperatives increases or is stable if agricultural production processes are resilient to the specific climate impacts.

Table 1: Potential sector-specific indicators for measuring adaptation benefits[14]

Close relationship of climate change adaptation with other Sustainable Development Goals (SDGs)

As can be seen in the previous examples of climate change adaptation technologies and business models, there is a strong overlaps and parallels with other Sustainable Development Goals (SDGs). This includes typical focus areas of impact funds such as food security, poverty alleviation, rural development and gender inclusion. With respect to the latter, in situations of poverty, women commonly face higher risks and greater burdens from the impacts of climate change than men. Therefore, women also benefit disproportionally from climate change adaptation, especially when implemented in a gender-sensitive manner.

Table 2 provides an overview of positive interplays between selected adaptation measures and SDGs. Due to these parallels, aiming for climate change adaptation impacts of investments may very well complement existing investment strategies that focus on related SDGs.

Adaptation measure	Positive impact on SDGs
Climate-resilient cropland management	
Climate-resilient infrastructure and urban planning	
Water use efficiency and water management	
Climate-resilient power systems	
Livelihood diversification	
Climate services, incl. early warning systems	

Table 2: Positive impacts of selected climate change adaptation measures on SDGs (based on IPCC, 2021)

Private Adaptation Finance

This primer has been developed as part of a project on Private Adaptation Finance, implemented by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH on behalf of the German Federal Ministry for Economic Cooperation and Development, which aims to mobilize investment in private sector solutions for climate change adaptation. The project supports the supply and demand side of capital for climate change adaptation & resilience investment in a holistic approach that includes ecosystem building and peer-learning, and connects the global debate to the local context and stakeholder scene. For more information on the project and its work with impact investors please contact denise.engel@giz.de or visit www.adaptationcommunity.net/private-sector-adaptation.

Endnotes

1 Bloomberg (2021). *Investors Bet Climate Adaptation Will Soon Be Profitable.* Available here.

2 Nishio, A. (2021). *When poverty meets climate change: A critical challenge that demands cross-cutting solutions.* Available here.

3 Cambridge Centre for Risk Studies (2021). *New approaches to help businesses tackle climate change.* Available here.

4 Bloomberg (2021). *Investors Bet Climate Adaptation Will Soon Be Profitable.* Available here.

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6 Mordor Intelligence (2021). *Drip Irrigation Market – Growth, Trends, COVID-19 Impact, and Forecasts (2022 – 2027).* Available here.

7 Definition adapted from: Convergence & UK FCDO (2021). *Blended Finance for Climate Report: How to Increase Private Investment for Climate Finance in Developing Countries.* Available here.

8 Acumen Fund, Inc. (2018). *Acumen Resilient Agriculture Fund – GCF Funding Proposal.* Available here.

9 Pegasus Capital Advisors (2021). *CRAFT – Catalytic Capital for First Private Investment Fund for Adaptation Technologies in Developing Countries.* Available here.

10 See also Convergence & UK FCDO (2021). *Blended Finance for Climate Report: How to Increase Private Investment for Climate Finance in Developing Countries.* Available here.

11 Heuberger, R., Stadelmann, M. (2021). *4 reasons why blended finance is our best bet in adapting to climate change.* Available here.

12 Based on Trabacchi et al. (2020). *Adaptation Solutions Taxonomy.*

13 Note that most adaptation indicators were developed for projects rather than for business models. UNIDO and BFA Global are currently working on an assessment of metrics for adaptation impact measurement with respect to their suitability for business models / use by investors. It is expected to be published in November 2022.

14 Adapted from GIZ & IISD (2014). *Repository of Adaptation Indicators. Real case examples from national Monitoring and Evaluation Systems.* Available here.

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