



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 Small and Medium-Sized Enterprises (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 and/or supply chains, for example agricultural practices, in a way that leads to significant climate change adaptation benefits. Under these circumstances, **the global climate adaptation market which was valued at USD 30 billion in 2024 is expected to reach USD 105 billion by 2032, exhibiting growth of almost 17% per year during the forecast period.**¹ However, while climate change adaptation has been an important topic for the development finance community for a number of years, awareness of private investments 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 years², 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.

In October 2025, Bill Gates published a rather controversial article about climate change, making the argument that we should place a greater focus on climate adaptation compared with mitigation. The article was written as a precursor to the COP30 climate summit in Brazil, where climate adaptation and human development have been put high on the agenda. In the article, Gates makes the argument “to refocus on the metrics that should count even more than emissions and temperature change: improving lives. Our chief goal should be to prevent suffering, particularly for those in the toughest conditions who live in the world’s poorest countries”³. Despite the controversy surrounding it, this article makes a clear push for greater investments towards climate adaptation in order to protect people from the coming effects of climate change.

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.

By shining light on this high potential opportunity, this primer seeks to act as a **call to action for impact investors to place a greater focus on investing in climate adaptation.**

A Call to Action for Impact Investors

As climate emissions continue to increase, the need for significant investments in climate adaptation is becoming ever more critical. However, as of 2022, only 5% of the USD 1.3 trillion in total annual climate finance was specifically earmarked for adaptation⁴. Today, climate adaptation investment needs are estimated to be between USD 215 – 387 billion annually in developing countries, and while some of this will be delivered through investments in the public sector, there is a large need and opportunity for investments into the private sector⁵.

Despite climate adaptation being an underrated and acutely underfunded opportunity, the benefits can be significant for both investors and society at large. For every USD 1 invested in adaptation, it is expected to yield over USD 10 in benefits over a 10-year period, while a recent study of global adaptation investments demonstrated average returns of 27% from these investments⁶.

While funding for climate adaptation has historically been low compared to mitigation, investing in climate adaptation makes more business sense than ever. A new report by the International Fund for Agricultural Development (IFAD) launched at COP30, highlights the “compelling” business case for investing in climate adaptation, describing climate adaptation as an “engine of economic opportunities”. IFAD noted a global investment

of USD 1.8 trillion in early warning systems, climate-resilient infrastructure, improved dryland agriculture, global mangrove protection and resilient water resources could yield more than USD 7.1 trillion in avoided costs and social and environmental benefits⁷. More and more businesses are now developing commercially viable and scalable business models to take advantage of this massive opportunity.

The size, growth, returns and urgency of climate adaptation finance represent a great opportunity for investors to invest in climate adaptation.

Defining climate change adaptation

Whereas climate change mitigation addresses 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 “*adjustments in ecological, social or economic systems in response to actual or expected climatic stimuli and their effects [...] to moderate potential damages or to benefit from opportunities associated with climate change.*”⁸

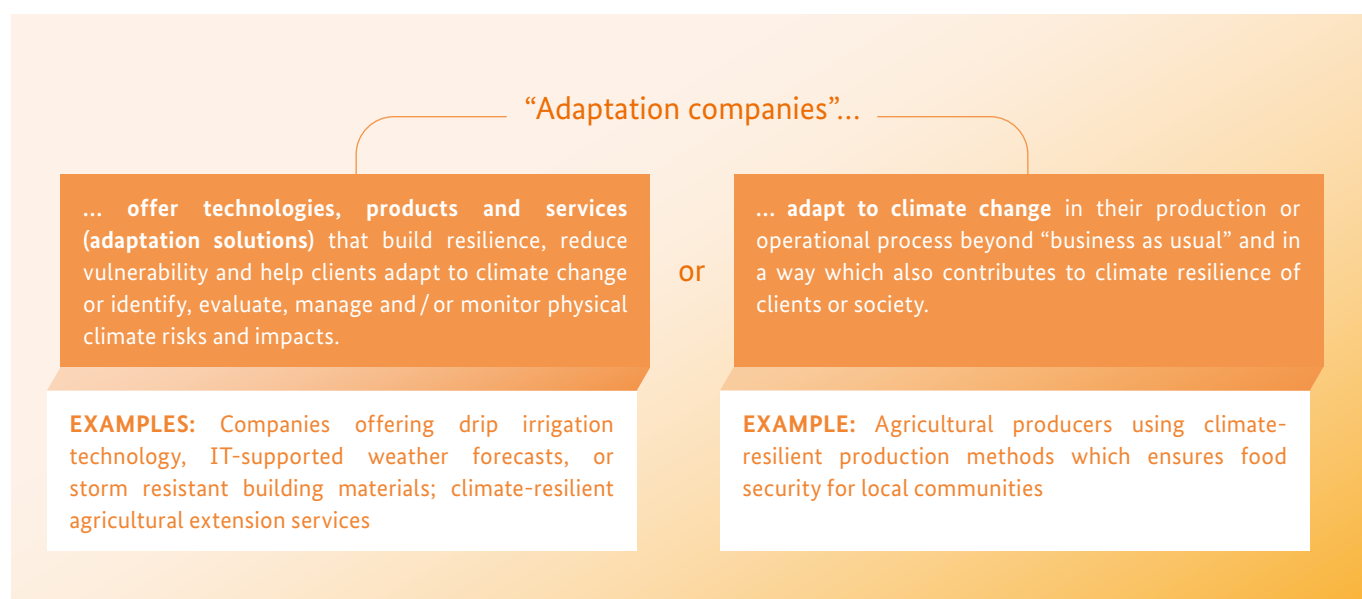


Figure 1: Two ways how companies can generate climate change adaptation impacts

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, enabling insurances and other financial products that can help offset losses, 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 awareness on investment opportunities and risks for climate change mitigation is relatively high, driven by the prominence of renewable energy technologies, there is **less understanding of these considerations 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 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 mobilising finance for innovative urban climate-resilient infrastructure in Sub-Saharan African cities. Services include the integration of nature-based solutions into infrastructure and urban spaces to make them more resilient to climate change impacts.

[Truk Rwanda](#) supports adaptation to climate change by investing in sustainable, energy-efficient cold storage facilities and transitioning to electric refrigerated trucks, thus reducing carbon emissions and energy consumption in the supply chain,

and enhancing food security through the reduction of post-harvest losses in a changing climate. Through empowering local farmers and enabling cold storage and logistics, Truk helps to build resilience in the agricultural sector.

Nigeria-based [Koolbox](#) has developed a solar-powered cooling system which it distributes to residential, commercial and healthcare customers. Refrigeration reduces food waste, thus improving food security, especially in a context of declining agricultural yields as a result of climate change. Solar-powered cooling solutions also improves access to healthcare, 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.

[OlsAro](#) is a Swedish-based AgTech offering a versatile solution to streamline trait discovery and variety development for multiple cereal crops. Their focus is on breeding climate-resilient seedlings that have a high tolerance to heat, drought and salinity in order to improve yields and enable sustainable farming of cereals.

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 USD 310 billion per year by 2035, with cost estimates increasing over time as climate impacts accelerate and intensify.⁹ Financial losses from extreme weather events, such as floods, heatwaves and droughts alone, were reported as being between USD 280 – 402 billion in 2024, 15% higher than the average from the previous decade.¹⁰

Analysts at Bank of America estimate that **the global climate adaptation market will reach USD 2 trillion a year in 2026**.¹¹ These global predictions are in line with market trends for specific adaptation technologies. The market for drought tolerant seeds is expected to grow by over 6% per year over the coming 5 years¹², and the market for drip irrigation technologies by over 10% per year.¹³ The fact that climate change impacts are likely to be felt faster, more widespread and more severely 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 result, **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.

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.

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 explicitly 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 USD 186 million of commitments by, among others, the Green Climate Fund, 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, as well as catastrophe risk modelling 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 USD 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, and with investments from the Dutch entrepreneurial development bank (FMO), PRO-PARCO, the Soros Economic Development Fund (SDEF), the Children's Investment Fund Foundation, and other investors and funders, the fund closed in June 2021 with USD 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 improve 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 USD 1.6 billion to improve the livelihoods and resilience of 10 million people. 40% percent 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 mobilises private climate finance for vulnerable smallholders and landscapes, co-developed by South Pole and the World Wide Fund for Nature (WWF). With a USD 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.

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.

The **Catalyst Fund** invests for a climate-resilient future in Africa and focuses on founders building tech solutions for climate adaptation and resilience. This fund invests USD 200K in pre-seed startups and follow on at Seed and Series A. They invest in climate-smart essentials services such as water management, cold storage, clean energy, waste management and health, as well in fintech, agriculture and sustainable livelihoods.

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 mobilise additional investments towards sustainable development**, in this case climate change adaptation in developing countries.¹⁴ 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 mobilising non-concessional and private investments. In the case

of ARAF, both tiers of capital share profits on a prorata basis.¹⁵ The Lightsmith Climate Resilience Fund will distribute profits according to a waterfall structure laid out in the fund's Limited Partnership Agreement.¹⁶ Such structures are typical for blended finance equity funds.¹⁷

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, commonly referred to as concessional finance.¹⁸



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

Blended 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. Other initiatives like UNEP's Global Adaptation Network and the WeADAPT also support through supporting knowledge sharing, networking and collaboration between climate adaptation actors.

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

From larger institutional investors and venture capital firms to smaller impact investors, foundations and family offices, an adaptation portfolio screening can be a first step to addressing climate change adaptation in their investment strategy. While they may already manage a portfolio of companies in sectors with tangible climate impacts or with potential climate change adaptation solutions, the portfolio screening may serve to:

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

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

STEP 1: DETERMINING CLIMATE IMPACTS AND RISKS

- Determine **climate change impacts** in the country / region where an investment 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 investor'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 PORTFOLIO COMPANIES

Evaluate whether the portfolio companies' business models have an adaptation relevance, namely if the companies...

- ... **offer 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
- ... **apply 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.

STEP 3: CONSIDER INTEGRATING CLIMATE ADAPTION INTO INVESTMENT MANDATE

- **Review investment strategy and mandate** to consider the potential for integrating climate adaptation more explicitly
- Integrate **climate adaptation indicators and impact measurement** into your approach and reporting
- **Communicate climate adaptation focus** as part of investment mandate to attract climate adaptation deal flow

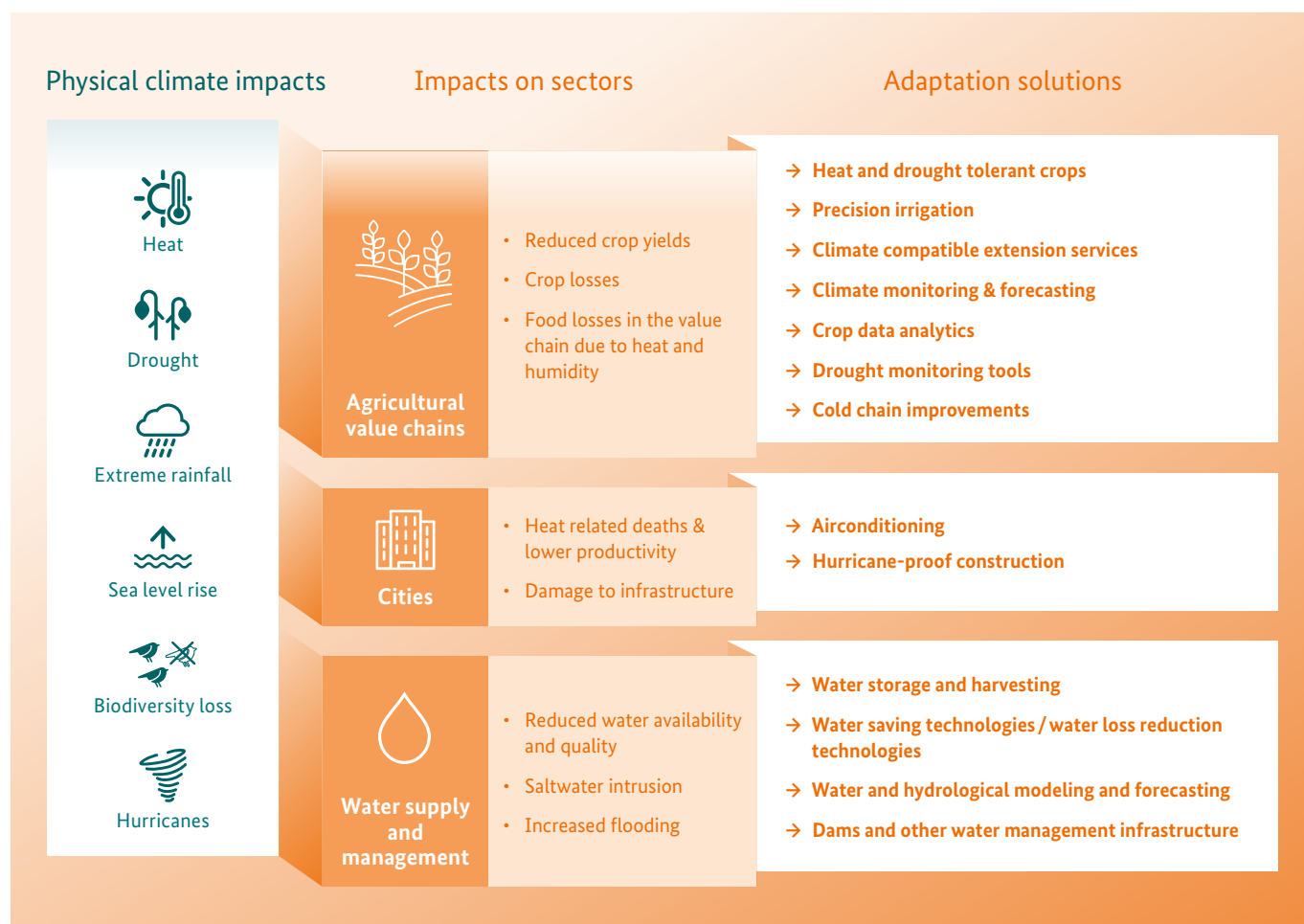


Figure 2: Schematic approach depicting key adaptation solutions in selected sectors¹⁹

Overview tables with adaptation solutions such as Table 1 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 of 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.

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).²⁰ ARAF 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 farmers using climate resilient crops	Drought and flood resistant crops can help farmers adapt to a changing climate.
% of additional fodder for grazing livestock	In situations where grazing no longer provides sufficient fodder due to unfavourable weather conditions, building food reserves for livestock increases climate resilience.
% of households at reduced flood risk due to new or enhanced flood defences	Construction of flood defences can minimise 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 benefits²¹

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 are 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 disproportionately 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	1 NO POVERTY	2 ZERO HUNGER	3 GOOD HEALTH AND WELL-BEING	5 GENDER EQUALITY	6 CLEAN WATER AND SANITATION	8 DECENT WORK AND ECONOMIC GROWTH	9 INDUSTRY, INNOVATION AND INFRASTRUCTURE	12 RESPONSIBLE CONSUMPTION AND PRODUCTION
	15 LIFE ON LAND	16 PEACE, JUSTICE AND STRONG INSTITUTIONS	17 PARTNERSHIPS FOR THE GOALS					
Climate-resilient infrastructure and urban planning	3 GOOD HEALTH AND WELL-BEING	6 CLEAN WATER AND SANITATION	8 DECENT WORK AND ECONOMIC GROWTH	9 INDUSTRY, INNOVATION AND INFRASTRUCTURE	10 REDUCED INEQUALITIES	11 SUSTAINABLE CITIES AND COMMUNITIES		
Water use efficiency and water management	3 GOOD HEALTH AND WELL-BEING	6 CLEAN WATER AND SANITATION	11 SUSTAINABLE CITIES AND COMMUNITIES	12 RESPONSIBLE CONSUMPTION AND PRODUCTION	15 LIFE ON LAND			
Climate-resilient power systems	1 NO POVERTY	2 ZERO HUNGER	3 GOOD HEALTH AND WELL-BEING	4 QUALITY EDUCATION	5 GENDER EQUALITY	6 CLEAN WATER AND SANITATION	7 AFFORDABLE AND CLEAN ENERGY	9 INDUSTRY, INNOVATION AND INFRASTRUCTURE
Livelihood diversification	1 NO POVERTY	2 ZERO HUNGER	3 GOOD HEALTH AND WELL-BEING	4 QUALITY EDUCATION	5 GENDER EQUALITY			
Climate services, incl. early warning systems	1 NO POVERTY	2 ZERO HUNGER	3 GOOD HEALTH AND WELL-BEING	5 GENDER EQUALITY	11 SUSTAINABLE CITIES AND COMMUNITIES	15 LIFE ON LAND	16 PEACE, JUSTICE AND STRONG INSTITUTIONS	17 PARTNERSHIPS FOR THE GOALS

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

WANT TO LEARN MORE?

More information regarding impact investing for climate adaptation can be found below:

- [Strengthening the investment case for climate adaptation: A triple dividend approach](#), World Resources Institute (2025)
- [Building Financial Instruments for Climate Adaptation](#), Climate Policy Initiative (2024)
- [Guide for Adaptation and Resilience Finance](#), Standard Chartered, KPMG, UNDRR (2024)
- [State and Trends in Climate Adaptation Finance 2024](#), Climate Policy Initiative (2024)
- [Adaptation & Resilience Impact: A measurement framework for investors](#), UNEP & ARIC (2024)
- [Adaptation Finance: Building the Investment Case](#), IFAD (2024)



Private Adaptation Finance

This primer has been developed as part of the [Private Adaptation Finance](#) project, implemented by the [Deutsche Gesellschaft für Internationale Zusammenarbeit \(GIZ\) GmbH](#) on behalf of the [German Federal Ministry for Economic Cooperation and Development \(BMZ\)](#) between 2021 and 2025, aiming to mobilise investment in private sector solutions for climate change adaptation. The project supported the supply and demand side of capital for climate change adaptation & resilience investment in a holistic approach including ecosystem building and peer-learning, and connected the global debate to the local context and stakeholder scene. For more information on the project and its work with impact investors visit www.adaptationcommunity.net/private-sector-adaptation/.

Endnotes

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- 19 Based on Trabacchi et al. (2020). *Adaptation Solutions Taxonomy*. Available [here](#).
- 20 Note that most adaptation indicators were developed for projects rather than for business models. The CIFAR Alliance, UNIDO and BFA Global have developed an assessment of metrics for adaptation impact measurement with respect to their suitability for business models / use by investors: CIFAR Alliance (2023): *A benchmark analysis of frameworks for measuring climate resilience and adaptation*. Available [here](#).
- 21 Adapted from GIZ & IISD (2014). *Repository of Adaptation Indicators. Real case examples from national Monitoring and Evaluation Systems*. Available [here](#).

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