

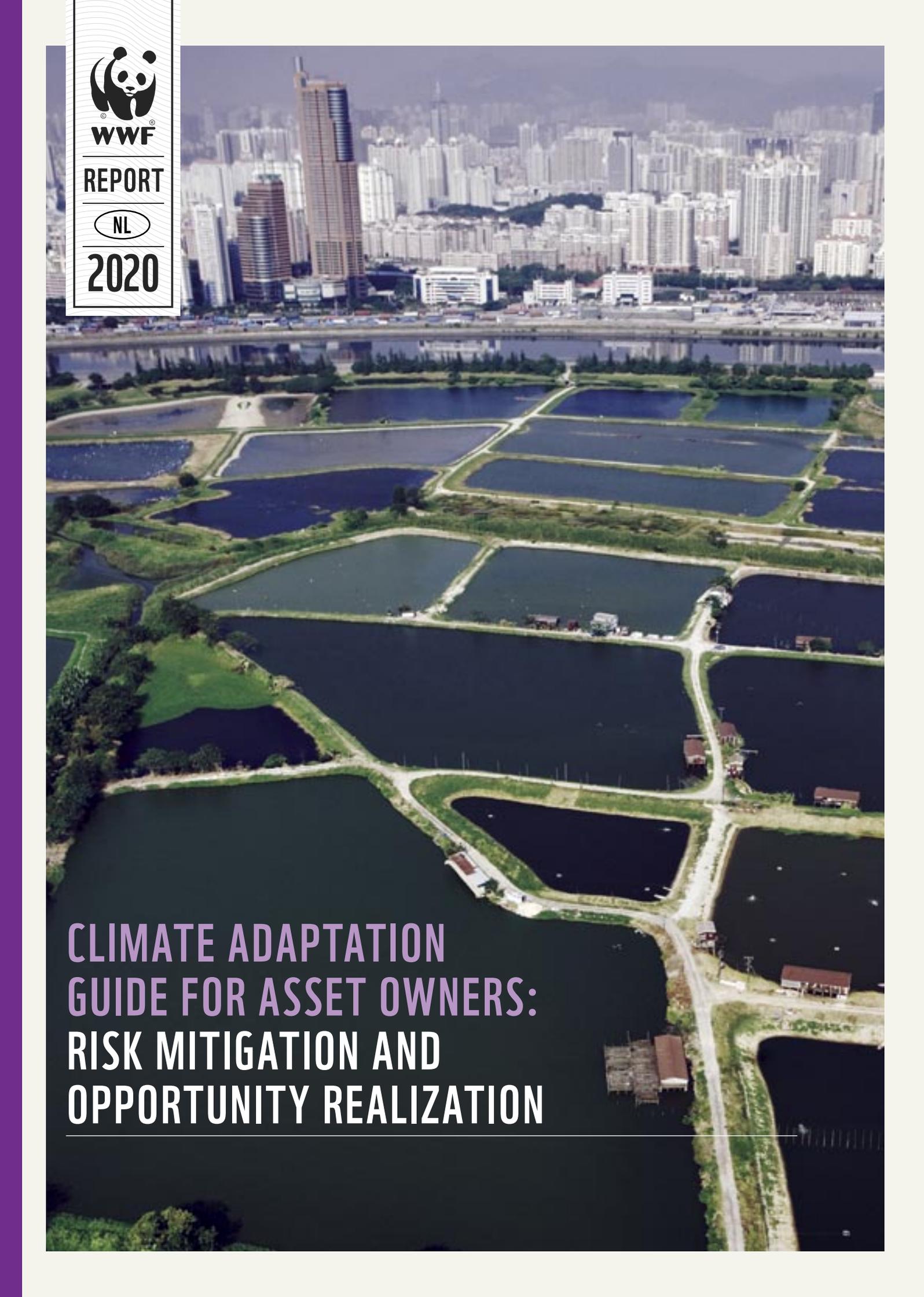


WWF

REPORT

NL

2020

An aerial photograph showing a large wetland area with numerous interconnected ponds and canals. The water is dark blue, and the surrounding land is green with some buildings and roads. In the background, a dense city skyline with many high-rise buildings is visible under a clear sky.

**CLIMATE ADAPTATION
GUIDE FOR ASSET OWNERS:
RISK MITIGATION AND
OPPORTUNITY REALIZATION**

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This report is part of a series in which WWF provides insights and recommendations for asset owners on how to respond to climate change. You can find the full list of publications [here](#).

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Cover photo: Aerial view of fish ponds in Mai Po Nature Reserve, Shenzhen City in background, Hong Kong. © Martin Harvey / WWF.

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Dried-up Thirlmere reservoir in the Lake District, UK. © GLOBAL WARMING IMAGES / WWF

WWF RECOMMENDATIONS AT A GLANCE

Asset owners are increasingly developing strategies to identify and manage risks from physical climate hazards as well as risks stemming from the transition to a low-carbon economy. Yet, the financial sector is still far from treating climate risk as a material risk which drives valuations of companies and assets or investment decisions. To date, efforts to address climate change or manage climate risk have mainly focused mostly on mitigation.

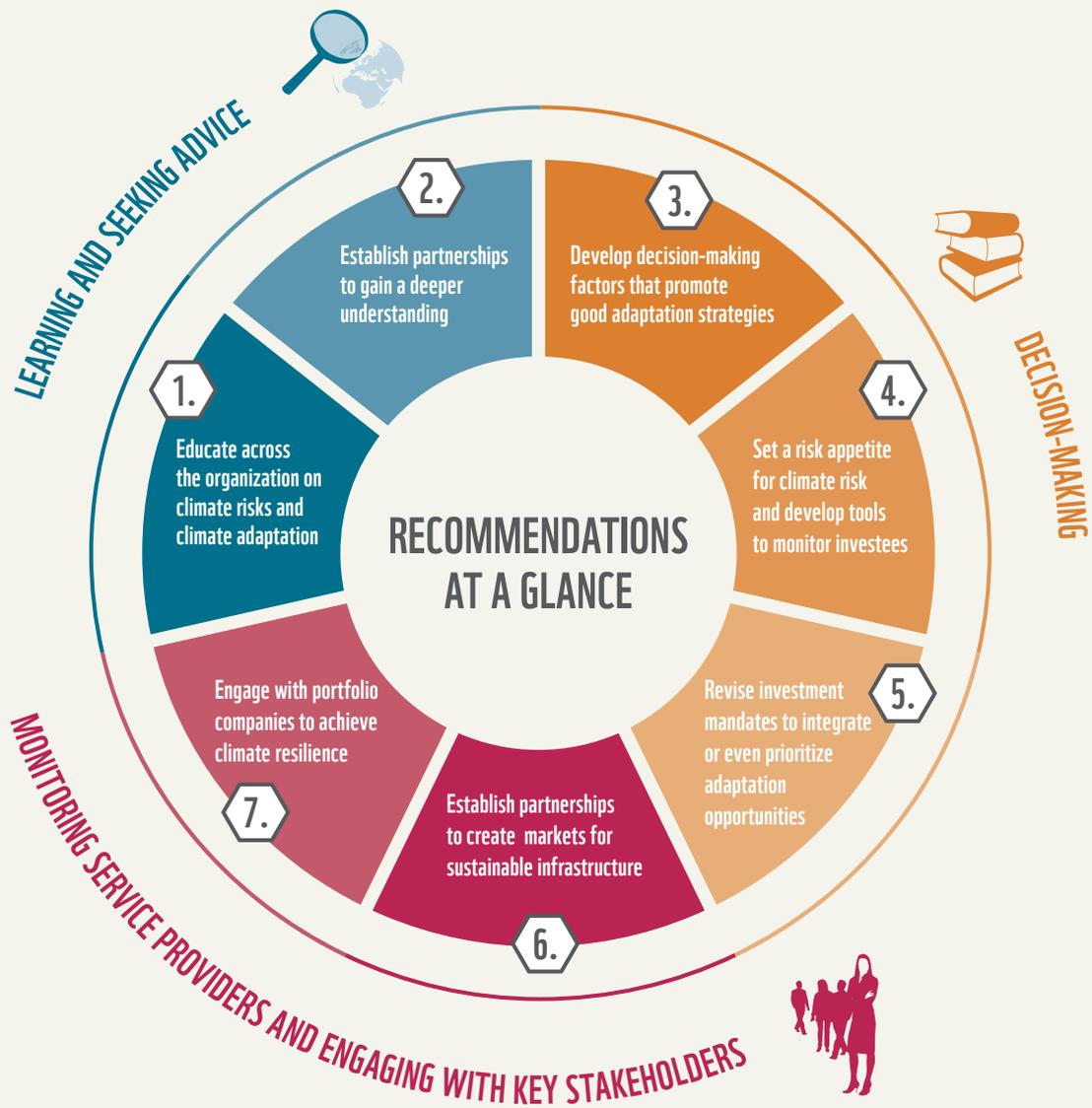
Climate Adaptation is the process of adjusting to actual or expected changes in climate and its effects. Climate adaptation is relevant for asset owners because through their portfolios they are directly (e.g. extreme weather events damaging portfolio companies) and indirectly (e.g. supply chain disruptions of portfolio companies) exposed to climate change risk. The investments required can rise to USD 500 billion per year by 2050; done correctly, it is also an opportunity to safeguard and restore nature.

**ADAPTATION COSTS
COULD RISE TO
USD 500 BILLION
PER YEAR BY 2050**

To build *climate resilience*, adaptation measures must take a systemic view. Focusing exclusively on economic and social priorities can result in the unintentional degradation of natural systems and natural capital, undermining long-term resilience of people, and livelihoods. This in turn will have a negative impact on economic development. WWF advocates that adaptation efforts include the use of landscape approaches and focus on establishing social-ecological resilience by ensuring that adaptation efforts avoid harming nature, use nature to help people, and help nature adapt also.

Engaging in climate adaptation offers asset owners the opportunities to mitigate risk and identify new investment opportunities. There are increasingly means to increase exposure to “good” climate adaptation interventions; indirectly, through portfolio entities’ adaptation to climate change, or directly, through dedicated channels including Adaptation-Themed Green Bonds, Availability-Based Payments in Public-Private-Partnerships and Climate-Themed Investment Funds. These channels are not new, but in practice can be scaled and expanded as prioritized investment opportunities to foster climate adaptation, particularly into emerging markets.

WWF offers seven recommendations for asset owners to channel investment into instruments that are widely understood by the investment community while bearing in mind that asset owners may have to review their mandate to capitalize on them. Acting on these recommendations will enable asset owners to build a deeper understanding of climate risk and the value of adaptation to mitigate risk and realize new value creation opportunities.



1.

INTRODUCTION

Despite continuing efforts to slow the rate and degree of human-induced climate change, its impacts are unavoidable and increasing. Climate change has become a megatrend that can disrupt markets, dislocate communities, and have devastating impact on nature and biodiversity.

Since the Earth Summit in 1992, efforts to tackle climate change have focused mainly on mitigation. As recently as 2018, adaptation efforts accounted for just 5%, or USD 30 billion, of USD 579 billion in tracked climate finance from both private and public finance sources.¹ It has been widely believed that each Euro or Dollar spent on climate should be focused on preventing climate change from happening rather than adapting to it. This was compounded by the conviction that climate change was a ‘future problem’. Not anymore. Climate hazards such as extreme temperatures, off seasonal and increased weather extremes such as heatwaves, droughts, floods and heavy storms are increasingly impacting society and the economy and are expected to increase exponentially as the rate of CO₂ emissions is still growing.² This will have an extensive impact on people and nature, and the international investment community is increasingly recognizing the need to place more of a focus on adapting to a changing climate.

THE NEED FOR CLIMATE ADAPTATION IS GLOBAL, BUT THE EFFECTS OF CLIMATE CHANGE ARE UNEVENLY DISTRIBUTED AND EXPERIENCED DIFFERENTLY BY DEVELOPED AND DEVELOPING COUNTRIES

The need for climate adaptation is global, but the effects of climate change are unevenly distributed and experienced differently by developed and developing countries. Developing countries may struggle to adapt more than developed countries, with less adaptive capacity and lower access to capital. According to a 2016 report by the United Nations Environmental Programme (UNEP), the costs of adaptation in developing countries could range from USD 140 billion to USD 300 billion per year by 2030.³ At the global scale, costs are likely to be between USD 280 billion and USD 500 billion per year by 2050, with even higher costs possible under higher emissions scenarios.

Natural capital plays a critical role in mitigating and adapting to climate change and loss of natural capital. Unsustainable practices compounded by human-induced climate change pose direct risks to the economy. Natural capital includes resources and systems such as water, forests, and clean air, which enable economic activity by providing businesses with materials, production inputs, protection from natural disasters, and absorption of emissions. Thus, a decline in natural capital affects asset owners directly as portfolio companies depend on natural capital to operate and meet performance targets. As institutional investors in the private sector, and often with exposure to the whole economy, asset owners hold a key role in addressing risks and promoting solutions, while ensuring the delivery of meaningful commitments.

¹ Climate Policy Initiative (2019), Global Landscape of Climate Finance 2019.
² NOAA Global Monitoring Laboratory, Boulder, Colorado, USA. Retrieved from https://www.esrl.noaa.gov/gmd/ccgg/trends/gl_gr.html
³ UNEP (2016), The adaptation finance gap report.

**DEMAND IS
GROWING FOR
CLIMATE-RESILIENCE
PRODUCTS AND
SERVICES**

Demand is growing for climate-resilience products and services, including new materials, engineering techniques, early warning systems, information tools, and climate and weather data. These investment opportunities will present themselves through multiple channels. There will be a significant increase in climate adaptation themed Green Bonds in the future (see Chapter 5); there will be an increase in listed and unlisted climate resilient infrastructure assets; and new partnership opportunities will emerge as governments provide de-risking instruments.

This report will start with a discussion on climate risk for asset owners, and how climate adaptation relates. An overview of climate adaptation is followed by a discussion on how climate adaptation offers opportunities to mitigate risk and access new value streams. The focus will then shift to opportunities for engagement: how can asset owners allocate capital to finance adaptation? The report will highlight instruments and investment vehicles which are currently available, discuss how asset owners can build cross-industry coalitions to create new markets for investment-scale adaptation projects, and how the role of Multilateral Development Banks (MDBs) and Development Finance Institutions (DFIs) is changing to allow for more institutional funding to enter the market. The report will also highlight other relevant trends, such as how nature-based solutions are emerging as a promising approach and the importance of partnerships at the local level. The report will conclude with concrete recommendations on how to act.

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2.

CLIMATE RISK FOR ASSET OWNERS

Asset owners are starting to develop strategies to identify and manage risks from climate change as well as risks stemming from the transition to a low-carbon and climate resilient future.⁴ Yet, the financial sector is still far from treating climate risk as a material risk which drives valuations of companies and assets or investment decisions. Furthermore, many asset owners currently equate climate risk with the carbon intensity of their investment portfolio. While this may be an important measure of the transition risk in a portfolio (as companies may be subject to carbon pricing), asset owners should expand their view to include other factors which cover both physical and transition risk, with an understanding of how the two aspects interact.

WHAT IS CLIMATE RISK?

Climate risk is often categorized as either **physical** or **transition risk**.

Physical risk can be understood as physical impacts caused by the Earth's changing climate. This is most commonly discussed as a rising average global temperature. The planet's average temperature has risen by about 1.1°C since the 1880s.⁵ This rate of warming is at least an order of magnitude faster than any found in the past 65 million years.

However, increasing global temperatures also affect a wider range of planetary conditions. Along with increasing temperatures, physical climate hazards include rising sea levels, increased frequency and intensity of rainfall and extreme weather events, temperature extremes, drought, and increased likelihood of wildfires. The Global Commission on Adaptation emphasizes “the effects of climate change will most immediately and acutely be expressed through water”.⁶ Although these hazards clearly impact human and physical capital, climate change also has major impacts on ecosystems causing chronic degradation of natural resources such as glaciers, forests, and ocean ecosystems, which provide important services to the economy and people. This in turn imperils the human habitat and economic activity over a longer time horizon.

Transition risk relates to changes in policy and regulation, shifting markets and technologies, and reputational risks associated with transitioning to a more climate resilient economy.⁷ Policy and regulatory changes have been part of the response to climate change since the 1992 Earth Summit in Rio de Janeiro, where the United Nations Framework Convention on Climate Change (UNFCCC) was adopted. Markets and technology risk factors arise from increasing efforts to transition to a low-carbon economy, with reputational and liability risks arising from shifting socio-cultural values and broader social movements.

“THE EFFECTS OF CLIMATE CHANGE WILL MOST IMMEDIATELY AND ACUTELY BE EXPRESSED THROUGH WATER”

The Global Commission on Adaptation

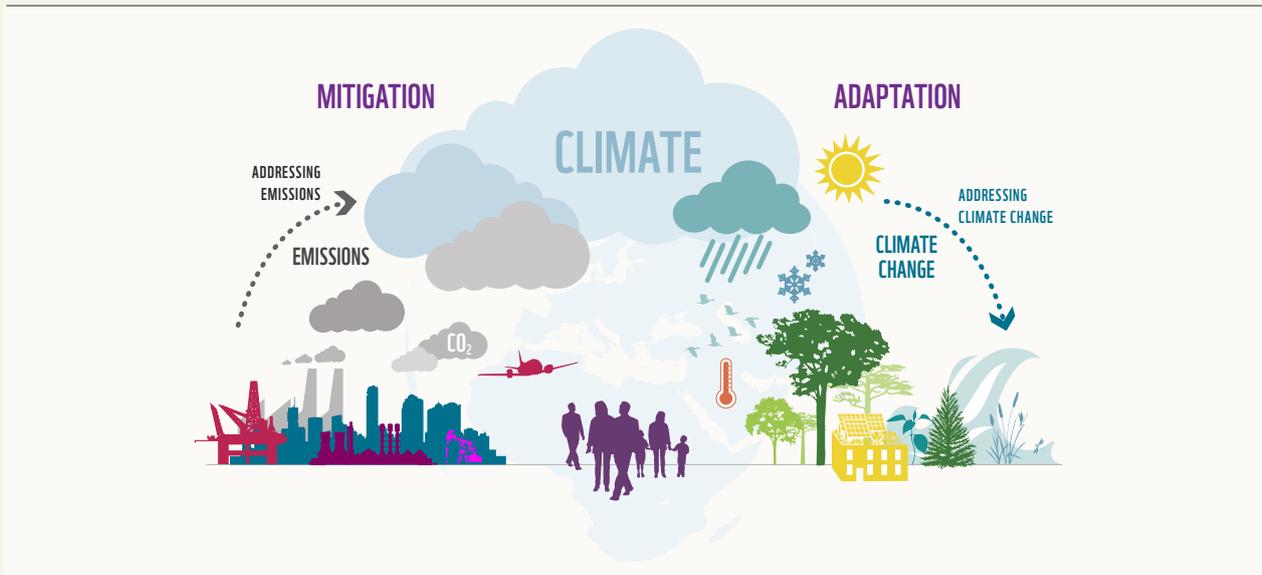
⁴ VBDO (2019), Dutch institutional investors and climate change – becoming part of the solution. Retrieved from <https://www.vbdo.nl/en/2019/11/dutch-institutional-investors-and-climate-change-becoming-part-of-the-solution/>

⁵ NASA's Scientific Visualization Studio (2020), Global Temperature Anomalies from 1880 to 2019. Data provided by Robert B. Schmunk (NASA/GSFC GISS). Retrieved from: <https://svs.gsfc.nasa.gov/4787>

⁶ Global Commission on Adaptation (2019) Adapt Now: A global call for leadership on climate.

⁷ The Task Force for Climate-Related Financial Disclosure (TCFD) defines these three categories of transition risk.

FIGURE 1 CLIMATE CHANGE MITIGATION AND ADAPTATION*



*Adapted from VBDO.

Although physical and transition risk are often considered separately, an integrated and systemic view is necessary to truly understand climate risk exposure. For example, a common focus of climate risk is scarcity of water resources. As the atmosphere warms, hydrological cycles are affected and the frequency, volume, form, and intensity of precipitation changes. Water intensive industries (such as mining, agriculture, or food and beverage companies) which are often operating in high risk areas can expect increasing competition for water resources as the climate changes. As a result, the physical hazard of water scarcity may be compounded by transition risk due to new regulations designed to protect water availability and quality, public health, and safety.

BOX 1. WWF WATER RISK FILTER

Launched in 2012, the WWF Water Risk Filter is a practical, online tool that helps companies and investors assess and respond to water-related risks facing their operations, supply chains and investments across the globe. The Water Risk Filter Version 5.0 is unique in its ability to combine basin and operational water risk to provide recommended response actions and evaluate how water risk can affect financial value. To help companies and investors in their strategic and long-term planning in the context of climate change, WWF is in the process of integrating climate and socio-economic pathway-based scenarios into the tool to support scenario evaluation of water risks and resilience in line with the Task Force for Climate-related Financial Disclosure (TCFD) recommendations.

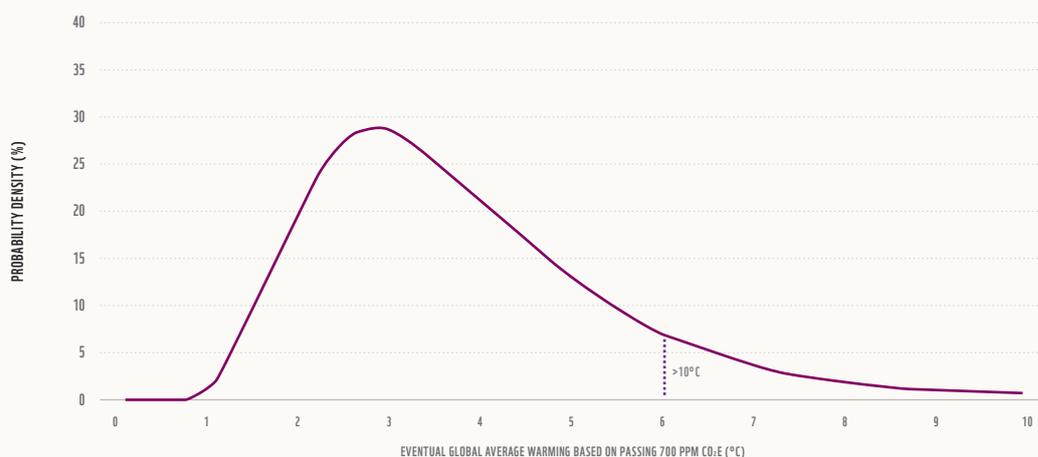
WHY SHOULD ASSET OWNERS TAKE NOTICE?

A 2015 report by *The Economist* estimates the value-at-risk (VaR) to the year 2100 at USD 4.2 trillion in present value terms, as a result of climate change impacts on the total global stock of manageable assets.⁸ The Bank of England warned in 2019 of a “climate Minsky moment” where asset prices may adjust quickly and cause losses as high as USD 20 trillion.⁹

Most analysis is based on the average (mean) expected loss; but the VaR calculation should include a wider range of scenarios, and tail risks are far more serious. The current business-as-usual trajectory (or RCP8.5 as defined by the IPCC) puts the world on a path of 4°C warming by 2100, based on the expected concentration of CO₂ in the atmosphere by 2100. There is significant uncertainty about how temperature responds to the concentration of atmospheric CO₂, or the so-called “climate sensitivity”. There is also a small (<10%) probability that under the business-as-usual emissions scenario, the temperature will rise by up to 6°C.

To put this in perspective: the average global annual temperature was around 13.8 °C from the 1880s through the 1910s and has risen by about 1.1°C to around 14.9°C today. Thus, a 5°C or 6°C would put the average global annual temperature around or above 20 °C by 2100. This opens the possibility of “fat upper tail risk”.

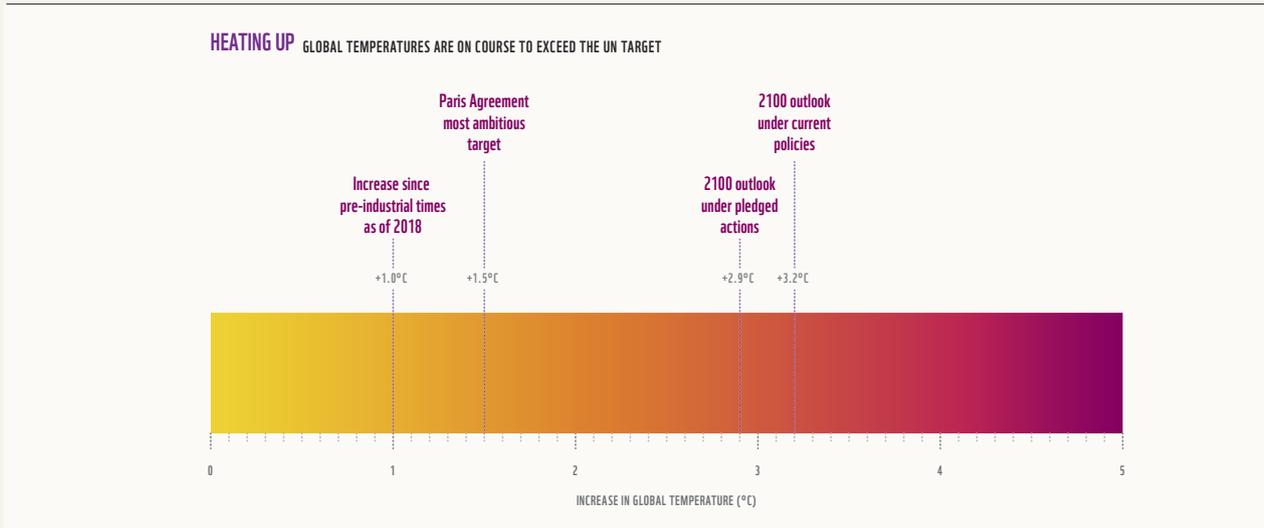
FIGURE 2 DISTRIBUTION OF RISK OF TEMPERATURE RISE BY 2100



⁸ The Economist Intelligence Unit (2015), *The cost of inaction: Recognizing the value at risk from climate change*.

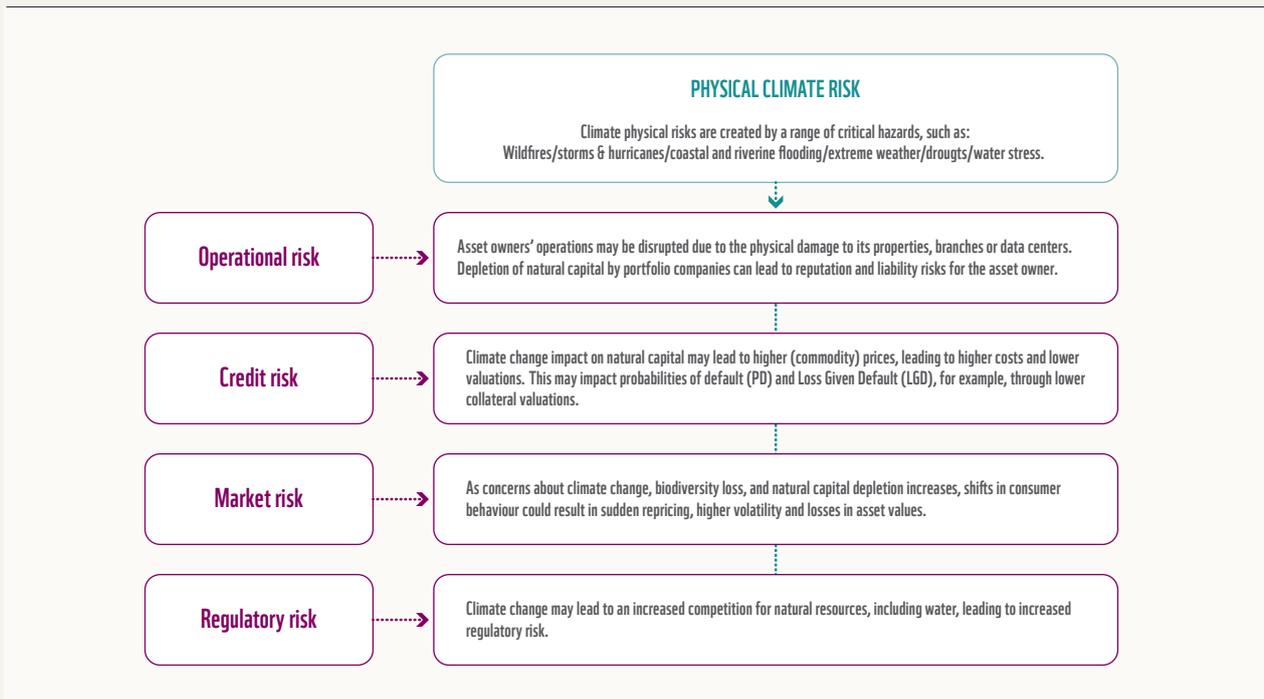
⁹ Bank of England (2019), *Avoiding the storm: Climate change and the financial system*.

FIGURE 3 RISING GLOBAL TEMPERATURE*



*Source: Climate Action Tracker (climateactiontracker.org/global/temperatures/). Figures as of September 2019. Outlooks for 2100 are median estimates.

FIGURE 4 CLIMATE RISK FOR THE FINANCIAL SECTOR



All asset owners are exposed to climate-related risks in the context of traditional industry risk categories such as credit risk, operational risk, market risk, and regulatory risk. **Credit risk** may arise as the ability of each individual company (or governmental entity, authority, municipality, county, state or nation) to pay the interest and principal on its debt can be impacted by climate change. The global nature of climate change means that the aggregated impact of climate hazards leading to credit risk across a portfolio could ultimately generate liquidity risk for the asset owner, even in a well-diversified portfolio. Major rating agencies are starting to incorporate climate risk into their credit risk assessment, but investors should form their own judgement as to whether this is done sufficiently.

BOX 2. CREDIT RISK

Miami's sea level has risen by 3.5 inches since 1992 and is projected to rise another 14 to 26 inches by 2060. The city already experiences regular high-tide flooding, even on clear, sunny days. Yet, in April 2019 Miami Beach raised a USD 162 million general purpose bond with 20 year maturity priced at the same yield as a similar April offering by Charlotte, North Carolina, an inland city with much less climate risk. Both issues had the same ratings from Moody's and S&P.

Asset owners can run **operational risk** as well, realizing interruptions or damages due to climate risk. Physical climate hazards may cause infrastructure and technology failures or loss, inaccessible premises interrupting the normal course of business, loss of life or reduced productivity of personnel, or failure to deliver from third party key service providers. Reputational risk also has a role to play. As the sustainable finance movement accelerates, asset owners are facing increasing scrutiny on how environmental, social, and governance (ESG) ratings play a role in investment decisions. In February 2020, one of Europe's leading investors walked away from a conventional Euro bond deal for a United States real estate company with a low ESG rating.¹⁰ Support for the recommendations of the Task Force for Climate-Related Financial Disclosures (TCFD)¹¹ is growing, with increasing interest in which banks and investors are not endorsing the initiative.¹²

BOX 3. OPERATIONAL RISK

In 2012 Hurricane Sandy shut down Wall Street for several days, but the headquarters of Goldman Sachs was unharmed. It was designed with a lot of redundancy and it had on-site back-up power.

¹⁰ IFR (2020), ESG ratings to the fore as bond investors step up scrutiny. Retrieved from <https://www.ifre.com/story/2246086/esg-ratings-to-the-fore-as-bond-investors-step-up-scrutiny-mq7c6fycjq>

¹¹ The Task Force on Climate-related Financial Disclosures (TCFD) develops voluntary, consistent climate-related financial risk disclosures for use by companies in providing information to investors, lenders, insurers, and other stakeholders. It was established by the Financial Stability Board (FSB), which is part of the G20. See: www.fsb-tcfd.org

¹² Financial Times (2019), Third of biggest banks fail to sign up to climate initiative. Retrieved from <https://www.ft.com/content/0eec5a1e-ee99-11e9-ad1e-4367d8281195>

Market risk may be the most prominent risk for asset owners. The combination of physical and transition risks can cause short-term volatility as well as long-term economic risk. Acute physical climate hazards may affect regionally concentrated markets or cause significant uninsured losses. Over time, longer-term climate changes may affect the viability of whole sectors or require significant investment to reimagine or re-locate the sector. While all asset owners are exposed to market risk, this holds particularly true for Universal Owners¹³ as climate change is a systemic investment risk that cannot be diversified away. The financial stability of the whole system is at risk.

BOX 4. MARKET RISK

The meat sector is starting to feel the impact of changing consumer behavior and stakeholder pressure. Meat production is major contributor to climate change and is associated with deforestation in countries like Brazil. Consumers are increasingly embracing ‘alternative proteins’, such as plant-based burgers. The value of the plant-based meat market across the globe is forecast to grow at a CAGR of 15 percent between 2018 and 2026. Companies that do not adjust their strategy may be losing market share and see profits drop.

Asset owners are subject to **regulatory risk** from all levels of the policy landscape. For example, regulators such as central banks are proposing stringent supervisory expectations that will require asset owners to update their risk management frameworks to include climate and environmental risk. Central Banks have been at the forefront of new regulations to manage climate risks. In 2019, the Bank of England announced a climate stress test, requiring financial institutions to incorporate three different environmental scenarios into normal annual stress testing. In May 2020 the European Central Bank (ECB) published a consultation document with its supervisory expectations for financial institutions across the Eurozone and participating Member States in the Single Supervisory Mechanism (SSM). These supervisory expectations are expected to set a new global standard on how financial institutions manage climate risk. But asset owners are exposed to local regulatory risks as well through their portfolio companies. Since 1972, there has been a 38-fold increase in environmental laws put in place, although enforcement remains a challenge in many jurisdictions.¹⁴ More stringent local environmental policies will increase compliance costs or in the worst case may lead to a loss of a company’s operating license.

BOX 5. REGULATORY RISK

Central banks see carbon pricing as one of the main tools to internalize the climate externalities. However, the Bank for International Settlements (BIS) also notes that carbon pricing schemes have not been implemented at a level sufficient to drive capital reallocation from “brown” (or carbon-intensive) to “green” (or low-carbon) assets. A quick ramping up of carbon pricing may lead to “stranded assets”.

¹³ Universal Owners are large institutions investing for the long-term in widely diversified holdings across multiple industries and asset classes, thus exposed to the entire market and economy. As defined by Urwin, R. (2011), Pension Funds as Universal Owners;

Opportunity Beckons and Leadership Calls, Rotman, International Pensions Management Journal, Spring 2011.

¹⁴ UNEP (2019), Environmental Rule of Law: First Global Report.

HOW TO PROCEED?

Understanding climate risk is of importance to asset owners on several levels. Identifying, prioritizing, and managing climate risk will allow asset owners to:

- Enhance risk management and develop a better understanding of the strategic impact of climate change on creating and protecting long term value for its beneficiaries;
- Create a framework for constructive dialogue between all elements of the investment chain. Understanding climate risk will allow asset owners to work with asset managers to thoroughly assess the financial impacts of physical risks and transition risks, as well as the opportunities resulting from climate change. This can enhance an asset manager’s dialogue with investee companies and encourage them to focus on long term value creation that benefits social, physical, and natural capital.

Yet, ultimately, what regulators and Chief Risk Officers want to know is the financial VaR, including Probability of Default and Loss Given Default. More needs to be done to integrate climate risk into the valuation of companies.

Although many asset owners have started work to identify, prioritize, and manage climate risk, no asset owner has a silver bullet and all are experiencing a learning curve due to the nature of climate risk. It is therefore important to develop an “adaptive management” approach: making decisions and adjustments in response to new information and changes in context. Adaptive management is not about changing goals during implementation, but about changing the path to achieving the goals in response to changes. As part of an adaptive management approach, asset owners can look to investing in climate adaptation as part of a risk management strategy, and as an opportunity to build value.

BOX 6. ALIGNING PORTFOLIOS WITH THE PARIS AGREEMENT

One of the goals of the Paris Agreement is to make “financial flows be consistent with a pathway towards low greenhouse gas emissions and climate-resilient development”.¹⁵ In 2018, WWF and several partners, including the World Resources Institute and the UN Global Compact, started the Science Based Targets initiative (SBTi). SBTi translates the carbon budget into individual targets on company and sectoral level. These targets apply to companies’ direct emissions (known as scope 1), emissions from the electricity they buy (known as scope 2), but also for all significant emissions across the value chain (known as scope 3). The SBTi launched a project to help financial institutions align their lending and investment portfolios with the ambition of the Paris Agreement. The project audience includes universal banks, pension funds, insurance companies and public financial institutions. As of February 2020, more than 50 financial institutions have publicly committed to setting targets through the SBTi.¹⁶

¹⁵ UNFCCC (2015), The Paris Agreement.

¹⁶ See a complete list of financial institutions committed to SBTi at <https://sciencebasedtargets.org/companies-taking-action/>



Mount Morgan mine, Queensland, Australia. © WWF / JAMES MORGAN

3.

CLIMATE ADAPTATION

The UNFCCC and the agreements that followed have always made a distinction between climate change mitigation and climate change adaptation.

Mitigation: Involves a human intervention to reduce the sources of greenhouse gases (for example, the burning of fossil fuels for electricity, heat or transport) or to enhance the sinks of greenhouse gases (such as the oceans, forests and soil).¹⁷

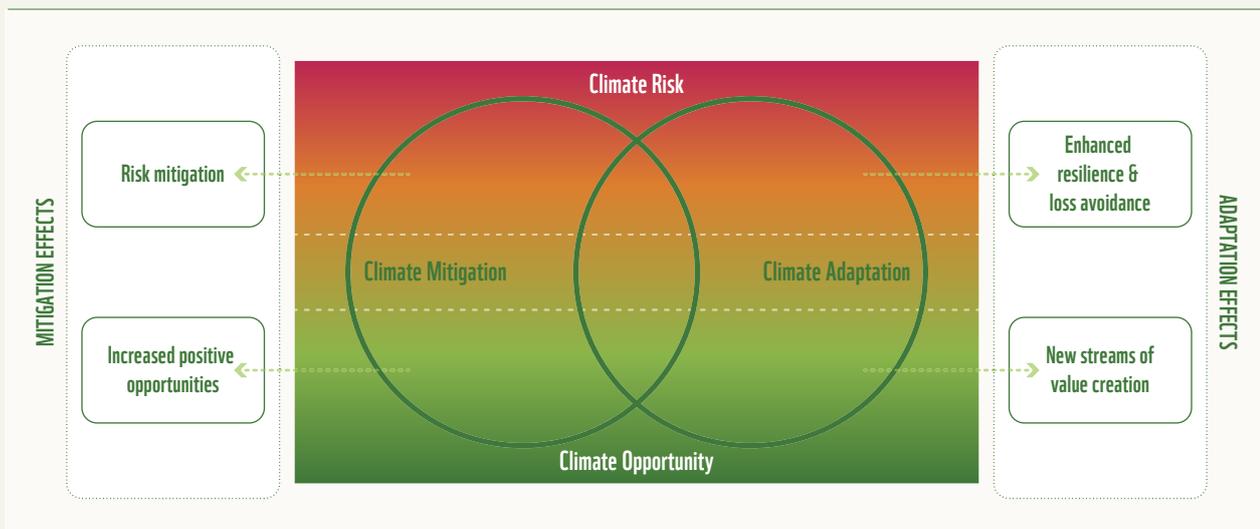
Adaptation: Involves the process of adjustment to actual or expected changes in climate and its effects. In human systems, adaptation seeks to moderate or avoid harm or exploit beneficial opportunities. In some natural systems, human intervention may facilitate adjustment to expected climate and its effects.¹⁸

The concept of **climate risk** is gaining more and more attention, particularly in the financial sector, although the term has been used by the IPCC since its inception. It relates to climate adaptation and mitigation in the sense that a proper risk assessment should inform a range of activities which may build climate **resilience** (the capacity of a system to withstand and recover from risk events) through mitigation or adaptation action.

Although climate risk is typically discussed as threat management, a proper risk assessment should also identify opportunities. Indeed, the changing climate also offers opportunities to identify new streams of value creation. An integrated approach incorporating climate risk and climate opportunity to achieve both mitigation effects and adaptation effects can yield benefits including risk mitigation, increased opportunities, enhanced resilience and loss avoidance, and identification of new streams of value creation.

ALTHOUGH CLIMATE RISK IS TYPICALLY DISCUSSED AS THREAT MANAGEMENT, A PROPER RISK ASSESSMENT SHOULD ALSO IDENTIFY OPPORTUNITIES

FIGURE 5 RELATING CLIMATE RISK AND OPPORTUNITY ACROSS CLIMATE MITIGATION AND ADAPTATION



¹⁷ IPCC (2018), Special Report on Global Warming of 1.5 °C. 7: Glossary.

¹⁸ IPCC (2018), Special Report on Global Warming of 1.5 °C. 7: Glossary.

WHAT IS REQUIRED AND WHO IS RESPONSIBLE?

The Global Commission on Adaptation,¹⁹ an initiative of the Global Centre on Adaptation and the World Resources Institute, has identified several key systems that are affected by climate change: systems that produce food, protect and manage water and the natural environment, plan and build our cities and infrastructure, protect people from disasters, and provide financing for a more resilient future.

A systemic view is critical to understanding and addressing the need for climate adaptation. FAO offers the example of an increasing global mean temperature causing agricultural losses and reduced yields, putting stress on food systems.²⁰ Reduced production could impact local food security (food availability) and raise prices locally and internationally (food accessibility). Addressing these challenges with adaptive measures may require all of policy and regulation interventions, adaptation of production practices, and changed practices in processing and distribution, among other interventions.

A key system is the natural environment itself. The natural environment is also under threat from climate change and many of the goods and services that nature provides may be lost if we do not help nature adapt as well. Whereas engineered solutions (or grey solutions) require input of finite resources and are less versatile than nature-based (or green) solutions, working together with nature can regulate water flows, protect shorelines, cool cities, and complement built infrastructure while delivering side benefits for both nature and people.

BOX 7. NATURE-BASED SOLUTIONS

Nature-based solutions harness the power of nature to reduce greenhouse gas emissions and help us adapt to the impacts of climate change. They are win-win solutions that involve protecting, restoring and sustainably managing ecosystems to address society's challenges and promote human well-being. Forests are probably the most well-known nature-based solution for climate change, but there are many more - including peatlands, mangroves, wetlands, savannahs, coral reefs and other landscapes.

Currently, climate adaptation is generally viewed as the responsibility of governments. It is considered their duty to protect coastal communities from erosion and to ensure that essential services such as electricity and water continue to be available - although even in developed countries there are already instances where large infrastructure assets are at risk and the question of who should pay for coastal protection is not yet settled.²¹ At the same time, the global climate finance gap is large and growing.

¹⁹ The Commission is led by Ban Ki-moon, 8th Secretary-General of the United Nations, Bill Gates, and Kristalina Georgieva, CEO, World Bank.

²⁰ FAO (2008), Climate change and food security: A framework document. P. 25, Table 1B.

²¹ Bloomberg (2016), Louisiana's Sinking Coast Is a \$100 Billion Nightmare for Big Oil. Retrieved from <https://www.bloomberg.com/news/features/2016-08-17/louisiana-s-sinking-coast-is-a-100-billion-nightmare-for-big-oil>

Two trends are converging that will change this picture: public sector efforts to crowd-in private sector capital through innovative financing mechanisms, and increasing private sector awareness of the relevance of climate adaptation finance. However, broadening ownership of climate adaptation efforts and increasing financing levels will require a higher level of communication and collaboration between the public and private sectors than seen today, and will continue to rise. Climate-aware companies are already using their own resources to safeguard business operations and supply chains against climate impacts. Many financial institutions are implementing measures to identify, measure and manage climate risk in their investment and lending portfolios.

WWF AND CLIMATE ADAPTATION

Many of the most biodiversity-rich places on earth are also those where both people and ecosystems are the most vulnerable to climate change. Increased finance for climate change adaptation presents both opportunities and challenges to shaping a viable future for people and nature. Supporting adaptation efforts that focus exclusively on economic and social priorities can result in the unintentional degradation of natural systems and thus undermine long-term resilience of people and their livelihoods. Although short-term adaptation may be achieved with economic and social benefits, depletion of natural capital or threatening the ability of ecosystems to evolve could lead to long-term vulnerability.

WWF ADVOCATES THE USE OF LANDSCAPE APPROACHES AS A KEY ELEMENT IN ENSURING THE LONG-TERM VIABILITY OF ECOSYSTEMS

WWF advocates the use of landscape approaches as a key element in ensuring the long-term viability of ecosystems. A landscape approach aims to reconcile competing social, economic and environment objectives. An integrated management approach includes managing land in a way that involves collaboration among multiple stakeholders with the purpose of achieving a sustainable landscape. These approaches seek to integrate conservation, sustainable use and where necessary restoration across a whole landscape mosaic to sustain biodiversity and ecosystem services, whilst ensuring room for subsistence and commercial activities.²²

WWF also works globally with communities, corporations and governments to drive “social-ecological” resilience. This includes working with stakeholders to prepare national and international adaptation policies, integrating environmental considerations into disaster recovery and reconstruction efforts, integrating adaptation measures into WWF landscapes/seascapes, and studying how ecosystems and species can become more resilient.

WWF has encouraged countries and donor institutions to follow three guiding principles when developing, supporting, and implementing adaptation efforts. These principles are equally important for asset owners aiming to assess the sustainability of a climate adaptation investment or activity of investees.²³

²² WWF (2016), Landscape Elements: Steps to achieving Integrated Landscape Management.
²³ WWF (2019), WWF Recommendations on Adaptation Finance: Building socio-ecological resilience to climate change.

FIGURE 6 WWF RECOMMENDATIONS FOR BUILDING SOCIAL-ECOLOGICAL RESILIENCE TO CLIMATE CHANGE



These principles are supported by nine recommendations for adoption during the development, financing and implementation of adaptation efforts. WWF is actively helping partners build social-ecological resilience by supporting climate adaptation that works at the intersection of nature's needs and people's needs at a landscape level.



Avoid Harming Nature

Sound adaptation efforts should carefully manage trade-offs, seeking actions that can help reduce vulnerability without undermining valuable ecosystem services that support resilience to climate change in the longer term.



Use Nature To Help People

Adaptation efforts should be aligned with and support broader strategies to incorporate nature's ability to contribute to addressing other challenges such as sustainable economic development and meeting societal needs.



Help Nature Adapt

Adaptation efforts should look to identify systemic solutions which acknowledge the important role of biodiversity and other natural elements in building resilience by applying climate-informed or climate-smart conservation strategies.



4.

RISK MITIGATION & VALUE CREATION

“IT IS CLEAR THAT THE EARTH IS ON AN UNSUSTAINABLE TRAJECTORY. SOMETHING WILL HAVE TO CHANGE AT SOME POINT IF THE HUMAN RACE IS GOING TO SURVIVE”

*JP Morgan*²⁴

A 2020 Special Report by JP Morgan aims to increase awareness on the impact of climate on the economy. The same report notes that “a rise in the [global] temperature will trigger changes in the climate: shifts in patterns and amounts of precipitation (including monsoons), decreases in ice coverage, changes in wind patterns (for example, El Niño), changes in humidity, the greater likelihood and severity of extreme weather events (droughts, storms, hurricanes, cyclones), and changes in flooding and sea levels.”

The evolution of the broader financial system towards investing in climate adaptation is essential, highlighting the critical role of asset owners. Although a strong argument, it is not necessary to rely on moral arguments alone to make the case for asset owners to be part of this systemic evolution and shift in capital allocation. Engaging in climate adaptation offers asset owners the opportunities to both mitigate risk and identify new value streams.

NATURAL CAPITAL AND THE ECONOMY

Natural capital is critical for human existence and is fundamental to our economic well-being. Natural capital includes resources and systems such as water, forests, and clean air that enable economic activity by providing businesses with materials, inputs to production, protection from disasters and absorption of the pollution. This link between natural capital and the economy varies from obvious examples of agri-food companies that provide sustenance to industrial companies which require freshwater for their processes. Thus, a decline in natural capital impacts economic activity and affects asset owners directly as many portfolio companies depend on natural capital to operate and to performance targets. One example is the impact of drought on the stock prices of food companies. In a 2016 study by the National Bureau of Economic Research, a (fictitious) portfolio where an investor would have shorted food companies located in countries in drought and would have taken long positions of food companies located in countries not in drought, would have generated a 9.2% annualized return from 1985 to 2015.²⁵

Climate change is among the primary drivers of the decline in the state of nature.²⁶ The increased intensity and frequency of extreme weather events including droughts and floods as well as sea-level rise and ocean acidification exacerbate the already negative trends in the natural environment. These trends have systemic effects on other aspects of natural capital such as biodiversity. Ocean acidification coupled with a global temperature rise means habitat loss for ocean populations and threatening complex ocean food webs.²⁷ The combined loss of physical climate hazards and loss of natural capital such as biodiversity impacts the long-term viability of the economy as companies rely on natural capital to deliver financial performance and societal value.

²⁴ JP Morgan (2020), Risky business: The Climate and the Macroeconomy.

²⁵ National Bureau of Economic Research (2015), Climate Risks and Market Efficiency.

²⁶ IPBES (2019) Global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, Summary for Policymakers.

²⁷ Environmental Protection Agency (n.d.), Ocean Acidification: Changing Ocean Chemistry. Retrieved from <https://www.epa.gov/ocean-acidification>

A SYSTEMIC APPROACH TO CLIMATE ADAPTATION MUST CONSIDER RISK TO NATURE AS WELL AS TO PHYSICAL ASSETS, WHILE ASSESSING THE NET POSITIVE IMPACT WITH AN UNDERSTANDING OF POTENTIAL INDIRECT EFFECTS

THE CASE FOR ADAPTATION

Humans and other species have adapted to live in diverse parts of the world with very different climates. The issue now is the pace and magnitude of changes in the global climate. Climate adaptation must therefore become a core strategy for asset owners. If climate change impacts natural capital, and natural capital is essential for the economy to flourish, there is a strong case for asset owners to promote climate adaptation on a systemic level. A systemic approach to climate adaptation must consider risk to nature as well as to physical assets, while assessing the net positive impact with an understanding of potential indirect effects. There is a double win in this strategy: asset owners will mitigate their own risk over time, and can identify new investment opportunities.

The United Kingdom Climate Impacts Programme (UKCIP) suggests that adaptation actions can be classified as either sector-specific through “Delivering Adaptation Actions”; or system-wide actions to “Building Adaptive Capacity”. The diversity and breadth of an asset owner’s portfolio suggests that system-wide actions would be most appropriate. There are two challenges for asset owners in considering a strategy to build system-wide adaptive capacity: indirect benefits may be overlooked if not well defined;²⁸ and, accepting systemic adaptive actions requires re-envisioning the investment time horizon. Despite these challenges, asset owners can still engage in climate adaptation to mitigate risk and create value.

RISK MITIGATION THROUGH CLIMATE ADAPTATION

At the heart of risk mitigation is understanding the mechanism of impact, which makes assessment of climate risks a critical step in the risk management process. By identifying how climate hazards trigger risk events, asset owners can identify the most effective adaptive actions.

Typically, climate adaptation offers asset owners the ability to enact **loss avoidance** or reduce the severity of impacts by **increasing resilience** on the portfolio level. Yet, many asset owners own a slice of the economy and cannot diversify away from climate change. Such Universal Owners should also pursue a strategy of **systemic adaptive actions**.

Asset owners can aim for **loss avoidance** by adapting investment strategies, such as reducing exposure to high-risk sectors or asset classes. Some asset owners are already taking this action by divesting from certain sectors or using shareholder engagements and voting power to influence the strategy of companies. This is particularly the case with the sectors depending on fossil fuels such as oil and gas companies and pure-play coal companies.

In addition, asset owners can look to **increase resilience** through adaptive action. Asset owners can increase their resilience by, for example, adapting investment policies and decision-making frameworks to incorporate climate risk as a material risk factor. This will better prepare them to respond and build resilience in the face of climate change by developing the ability to react quickly in the face of change.

²⁸ Econadapt (2015), Defining the opportunity costs of adaptation.

If we accept that climate change is a systemic risk that cannot be diversified away, then the **systemic adaptive** actions that asset owners can pursue would entail working with a wide range of stakeholders including governments and civil society. Recognizing the role of natural capital and the impacts of climate change to natural capital requires that asset owners take a broad view and work through their portfolio companies to manage their impacts and dependencies on natural capital.

A toolbox for asset owners to achieve better outcomes for portfolio companies, people, and nature already exists in part. Through direct engagements or through collaborative platforms such as CERES Investor Water Hub,²⁹ asset owners can work with their portfolio companies to build climate resilience. Asset owners can also use their voting power to build awareness among portfolio companies, and where needed, apply shareholder pressure to take action and build climate resilience.

VALUE CREATION THROUGH CLIMATE ADAPTATION

Although viewing climate impacts with a focus on risk mitigation is gaining ground, investing in climate adaptation may also open new streams of value creation with substantial opportunity for gains. There are two ways in which asset owners can get exposure to climate adaptation interventions: direct investment opportunities such as green bonds and real assets such as sustainable infrastructure, or indirect investment opportunities such as investments in companies that are taking steps to become climate resilient.

In 2018, the Global Commission on the Economy and Climate (the Global Commission) produced the “New Climate Economy” report which found that bold action on climate could yield a direct economic gain of USD 26 trillion through to 2030 compared with business-as-usual.³⁰ Some traders are starting climate change themed hedge funds, and climate-focused indexes are arising. Asset owners can take advantage of these new value streams that arise with accelerated growth as the world looks to transition to a climate resilient economy. New value streams may be classified as arising from a blend of three sources: technology development, implementation of nature-based solutions alongside a landscape approach, or as a response to policy, legal, or financial measures.³¹ Such new value streams will be created in the wider climate-related investment universe, including clean energy, sustainable infrastructure, agriculture, and a circular economy.

Yet, we must ensure that capturing such opportunities does not create significant harm to other climate and nature related goals. For example, purpose-grown biofuel crops may present the opportunity to adapt to changing regulations, but large-scale deforestation with the objective of growing biofuel inputs may negate any reduction in fossil fuel use by also reducing forests acting as natural carbon sinks. It may also have social consequences, contributing to food insecurity where agricultural crops are substituted for biofuel. WWF advocates that investors look beyond siloed individual investments and consider climate risks across landscapes and regions.

**BOLD ACTION ON CLIMATE
COULD YIELD A DIRECT
ECONOMIC GAIN OF
USD 26 TRILLION THROUGH
TO 2030 COMPARED WITH
BUSINESS-AS-USUAL**

*Global Commission on the
Economy and Climate*

²⁹ <https://www.ceres.org/resources/toolkits/investor-water-toolkit>

³⁰ New Climate Economy (2018), Unlocking the inclusive growth story of the 21st century: Accelerating climate action in urgent times.

³¹ Climate-ADAPT refers to these as grey, green, and soft adaptation actions.

Similarly, sustainable agriculture combined with forest protection can allow for adaptation to changing climate conditions while incorporating nature-based solutions, supporting local populations in building resilience to climate related hazards through improved economic status, and increasing supply chain stability for the food and beverage sector. Investing in companies that take these steps to build climate resilience allows exposure to companies generating new technologies with significant market potential such as drought tolerant seeds or establishing improved practices which could offer competitive advantage. For example, some breweries have made real progress in investing in climate smart solutions, including crop diversification and working with local communities to manage scarce water resources. For example, WWF partners with AB InBev in Bolivia, South Africa and Zambia to develop blended finance approaches to encourage private sector investment at the scale required to improve water access and quality, enhance the health of river basins and ensure that the needs of local communities are met.³²

³² AB InBev (2018), Annual Report 2018: Shaping the Future.



Rice paddy terraces, northern Vietnam. © EDWARD PARKER / WWF

5.

ENGAGING IN CLIMATE ADAPTATION INVESTMENTS

All countries need to adapt to climate change, the most vulnerable countries may be those in the developing world who have the least capacity and resources to adapt to the changing climate. Many of these countries are not included in the investment mandate of large asset owners. Therefore, it is difficult to get direct exposure to adaptation investment opportunities across the full range. The barriers to private sector investment in developing countries are well known, and include corruption, poor legal, economic and regulatory frameworks, immature financial markets, and currency exchange risks. This could partly explain why many asset owners only have limited exposure to emerging market debt and equity. For developing countries to attract private capital, they often need to work through intermediaries with an investment grade credit rating.

Some of these opportunities do not present themselves through regular channels. It requires asset owners to actively engage with a range of stakeholders, including governments, asset managers, MDBs/DFI's, and stakeholder groups.

IT REQUIRES ASSET OWNERS TO ACTIVELY ENGAGE WITH A RANGE OF STAKEHOLDERS, INCLUDING GOVERNMENTS, ASSET MANAGERS, MDBS/DFI'S, AND STAKEHOLDER GROUPS

DIRECT AND INDIRECT EXPOSURE

There are two ways in which asset owners can get exposure to climate adaptation interventions: direct climate adaptation investment opportunities such as green bonds and real assets such as sustainable infrastructure, or indirect climate adaptation opportunities such as investments in companies that are taking steps to become climate resilient.

This chapter will describe three direct channels to identify direct climate adaptation themed investment opportunities. But, asset owners are indirectly exposed to climate adaptation as well if portfolio companies are unaware or unable to identify and manage climate risks. It is therefore imperative that asset owners work with portfolio companies to reduce their climate related risks by helping them to improve their environmental performance.

For example, water intensive industries such as the beverage industry or meat production face material climate risks. If a portfolio company does not manage these risks adequately and in a sustainable manner, then the company may face fines, have its operating license revoked, or experience reputational risks. This ultimately increases the risk profile of the company, all else being equal. As these risks will increase as climate change will accelerate, investors should take action.

WWF believes that overall, financial institutions engagement holds significant potential for improving sustainability. Divestment should be a last resort. There will be increasing pressure on financial institutions, at least in the European Union, to work with their clients and transition them into a climate-resilient economy.

Reducing physical climate risks in investment portfolios may pose a big challenge. Investors will need high quality climate impact data and need to assess the investees adaptive capacity to manage this risk. In the future, investors can expect that climate risk reporting by companies will improve as the recommendations of the TCFD are being implemented, and other regulatory requirements are adopted, such as the EU Sustainability Taxonomy.

Thus, investors will benefit by investing in and engaging with companies that develop sustainable adaptation plans to manage climate risks and positively contribute to addressing the global climate adaptation challenge. Companies that are not transitioning could become stranded assets in the future, experience higher capital and operational costs, may become uninsurable or struggle to maintain growth and productivity.

BUILDING NEW MARKETS: THE ROLE OF GOVERNMENT

A particularly important role exists for governments. Climate change is caused by more than just a market failure; in particular, attracting private capital for climate adaptation means that governments must lead the way and start investing along the entire innovation chain and define new high-risk directions. There would have been no internet, no nanotech, and no clean-tech if governments had not accepted failure and tackled extreme uncertainty. To address climate adaptation, asset owners should seek deeper levels of cooperation with government agencies and define climate adaptation as a ‘moonshot’ project.

Many climate adaptation projects are not currently commercially viable as stand-alone investments or portfolios. However, governments can step in and design structures through which the private sector can allocate funding in a manner that is commensurate with the principles underpinning their investment mandates. This chapter will highlight several examples where governments went beyond correcting market failures and provided risk capital to crowd in private capital.

According to a report from Moody’s Investors Service,³³ project finance bank loans for green use-of-proceeds projects demonstrate a lower risk of default compared to project finance bank loans for non-green use-of-proceeds projects. Many green use-of-proceeds projects have the benefit that they are issued by governments, or otherwise supported by them. This shows that an active role of the government can provide the right incentives to crowd-in private sector funding.

CLIMATE ADAPTATION FOR EMERGING MARKETS

Asset owners may have investment mandates which limit their investment into emerging markets. While asset owners may feel they can avoid the higher risk profiles of emerging markets in this manner, if emerging markets cannot adapt to climate, there remains indirect climate risk exposure to all actors in the financial system. To build deep climate resilience, the financial sector must adapt across all markets.

**PROJECT FINANCE
BANK LOANS FOR GREEN
USE-OF-PROCEEDS
PROJECTS DEMONSTRATE
A LOWER RISK OF
DEFAULT COMPARED
TO PROJECT FINANCE
BANK LOANS FOR
NON-GREEN USE-OF-
PROCEEDS PROJECTS**

Moody’s Investor Service

³³ Moody’s Investor Service (2018), Research Announcement: Project finance bank loans for green use-of-proceeds projects demonstrate lower default risk.

Perceived or real, barriers to scaling up climate adaptation investment in emerging markets may include investment mandates, ticket sizes, and risk profiles of investments. Existing channels to engage in adaptation, whether direct or indirect, are often focused on developed nations but can overcome these barriers to scale adaptation finance in emerging markets. Investment mandates may require expansion, or re-interpretation. Large ticket sizes can be managed through aggregation of investment opportunities, or integration of investments across large landscape areas. The inherently riskier nature of emerging markets can be managed through partnerships to develop innovative structures with the use of first-loss capital or other mechanisms to manage risk exposure. By taking a pro-active approach to engage in climate adaptation for emerging markets, asset owners can work towards building systemic climate resilience and thereby limit their own indirect exposure to climate risk, while actively managing direct exposure to emerging markets.

INVESTING IN CLIMATE ADAPTATION: EU TAXONOMY

Many financial sector participants have asked themselves whether their investment or lending meets the sustainability threshold and how to contribute to this transition. Lingering uncertainty around what is green and what is not has held back the deployment of capital as no investor wants to be accused of greenwashing.

The EU has stepped into this void to develop a framework to facilitate sustainable investments (a so-called ‘Taxonomy’) that sets new disclosure requirements for a broad range of companies and financial institutions through an EU-wide regulation.³⁴ An EU Technical Expert Group (TEG) on Sustainable Finance released final recommendations³⁵ on climate mitigation and adaptation for the EU Taxonomy in March 2020, which are expected to be coded into EU law before the end of 2020. The EU Taxonomy is one of the key elements of the EU Action Plan, with the purpose of reorienting capital flows towards sustainable investments. It aims to create a uniform and harmonized classification system of what is and what is not a sustainable investment.

While the new disclosure requirements under the EU Taxonomy regulation only apply to European and foreign market participants with sustainable financial activities in Europe, it may also be used outside the EU. Other countries have also started to follow the EU TEG model. The UK has established the Green Finance Taskforce. Canada has set up the Expert Panel on Sustainable Finance and Australia has established the Australia Sustainable Finance Initiative.

For climate adaptation, the EU Taxonomy has identified 68 climate change adaptation activities to guide investors on what falls within the definition of ‘sustainable’. The EU Taxonomy makes a distinction between two types of adaptation activities:

- Activities that increase climate resilience by integrating measures to perform well in a changing climate;
- Activities that enable adaptation of other economic activities.

³⁴ European Council (2020), Press release. Sustainable finance: Council adopts a unified EU classification system.

³⁵ EU Technical Expert Group on Sustainable Finance (2020), Taxonomy: Final Report of the Technical Expert Group on Sustainable Finance.

The overall goal of the EU is that all sectors must improve their resilience to climate change. This also helps extend the definition of climate adaptation to a broader range of economic activities, if the goal of the activity is to improve climate resilience. Importantly, EU Taxonomy recognizes the importance of nature-based solutions: one of the criteria is that the solutions must “consider the viability of ‘green’ or ‘nature-based’ solutions over ‘grey’ solutions to address adaptation”. In other words, green where we can, grey where we must.

There are increasingly promising channels through which asset owners can become exposed to climate adaptation projects. Three such channels are highlighted below, to which the EU taxonomy provides guidance:

- Adaptation-Themed Green Bonds
- Availability-Based Payments in Public-Private-Partnerships
- Climate-Themed Investment Funds

CHANNEL 1

Adaptation-Themed Environmental Bonds (so called ‘Green Bonds’)

Environmental bonds, also called ‘green bonds’ or ‘blue bonds’ is a fixed-income instrument that is specifically earmarked to raise capital for environmental projects, including climate adaptation. Many institutional investors are already exposed to green bonds where the proceeds are used for climate adaptation: for example, the Nederlandse Waterschapsbank (NWB Bank) has issued more than EUR 10 billion in Green Bonds to date, many of which have been bought by European asset owners. One of the projects that received funding through the NWB Green Bond is an Urban Water Buffer in Rotterdam. This Urban Water Buffer reduces flood risk and makes additional water available in periods of drought.

Currently, overall it is up to the issuer to determine whether a green bond is green, based on international guidelines and standards. As the green bond market gained traction in 2016, WWF signaled that a lack of robust, credible, fully developed and widely accepted industry standards for green bonds was urgently needed.³⁶ Since then several developments have contributed to such standards.

The EU TEG on Sustainable Finance published its Report on EU Green Bond Standard (EU GBS) in June 2019. The EU GBS is aligned with the detailed EU Taxonomy which provides guidance on which projects are considered green or not. The Chinese government has also issued a Green Project Catalogue,³⁷ which is expected to be revised in 2020.

³⁶ WWF (2016) Green bonds must keep the green promise! A call for collective action towards effective and credible standards for the green bond market.

³⁷ Climate Bonds Initiative (2019) Comparing China’s Green Bond Endorsed Project Catalogue and the Green Industry Guiding Catalogue with the EU Sustainable Finance Taxonomy (Part 1).

THE SIZE OF THE GREEN BONDS MARKET HAS GROWN SIGNIFICANTLY SINCE 2016, REACHING USD 258 BILLION IN 2019, AND IS EXPECTED TO GROW TO USD 350 BILLION IN 2020

Furthermore, the Climate Bonds Initiative (CBI), a not-for-profit organization that certifies green bond issuances, developed sector-specific Climate Resilience Criteria. A key point is that investments can be ‘asset-focused’ or ‘system-focused’ (or both). The size of the green bonds market has grown significantly since 2016, reaching USD 258 billion in 2019, and is expected to grow to USD 350 billion in 2020. Yet within labelled green bonds, adaptation and resilience is only a small proportion of use of proceeds. According to CBI, the allocation of green bonds to all of waste, land use, industry, information and communication technologies, and adaptation and resilience represented only around 10% of total 2019 issuance.³⁸

One challenge is that not all public issuers which invest their proceeds into climate resilience label the bonds as such. While climate adaptation can be one of the categories for use of proceeds, the bond itself may simply be a Green Bond or even an unlabeled bond. One exception thus far was in 2019 when the EBRD issued a first ever dedicated climate resilience bond of USD 700 million.

BOX 8. MIAMI FOREVER BOND

In 2019 Miami raised USD 400 million in a Forever Bond, a general obligation bond, to finance a range of adaptation measures. The bond will be paid for by an increase in real estate taxes. Thus, this development highlights the two core messages of this report: climate adaptation is both a risk (in this case to real estate investors in Miami) and an opportunity (to investors in the Forever Bond and the companies implementing the adaptation activities).

The world leader in issuance of green bonds is the European Investment Bank (EIB) with over EUR 26.7 billion raised across 13 currencies as of December 2019. Yet, even where green bonds may contribute to adaptation, the EIB does not apply an adaptation label. In November 2019, the EIB announced their intention to mobilize EUR 1 trillion of investments in climate action and environmental sustainability in the decade from 2021 to 2030.

Green bonds in emerging markets

To address the need for climate adaptation in developing countries through green bonds, the most promising channel through which asset owners can get exposure is through MDBs such as the World Bank, IFC, Inter-American Development Bank. For example, the World Bank, whose clients are largely developing countries and economies in transition, has issued Green Bonds since 2009. Their use of proceeds include protection against flooding (including reforestation and watershed management), food security improvement and implementing stress-resilient agricultural systems (which slow down deforestation), and sustainable forest management and avoided deforestation. In September 2019, eight MDBs announced that they will increase global climate finance to USD 65 billion by 2025, and within this total, double the annual combined climate adaptation finance to USD 18 billion.³⁹

³⁸ Climate Bonds Initiative (2020) 20019 Green Bond Market Summary.

³⁹ ADB, African Development Bank Group, AIIB, European Bank for Reconstruction and Development, European Investment Bank, IDB, IsDB, New Development Bank, World

Bank Group (2019), High Level MDB Statement: For publication at the UNSG climate action summit, 22 September 2019.

One example comes from a Green Bond issued by the African Development Bank (AfDB).⁴⁰ As part of their Green Bond program, the AfDB allocated USD 77 million to a Farm Income Enhancement and Forest Conservation project in Uganda. The project provides necessary resources and inputs to enable farmers increase and manage valuable and profitable vegetation cover in local forest reserves, community forests, natural forests and degraded landscapes. The project will further support apiculture activities (rearing honeybees) within selected watershed areas so that they contribute to conservation of forests and increase the quantity and quality of honey for immediate income generation.

Climate adaptation financing is likely to be one of the major drivers fueling the growth of green bonds in the future. Chapter 6 will provide guidance on what asset owners can do to support the supply of adaptation-themed bonds, or work towards more direct exposure to adaptation in emerging markets.

CHANNEL 2

Availability-Based Payments in Public-Private-Partnerships

There is a perception that many climate adaptation projects are not considered “bankable” because climate adaptation is considered a public good: it is the government’s responsibility to ensure that coastlines (for example) are protected. Traditionally, governments have funded some or all capital investment in such projects. But governments may not have enough capital to finance all climate adaptation projects, or for other reasons (such as efficiency) may want to redistribute the share of risks and responsibilities among stakeholders.

Public-Private-Partnerships (PPPs) bring together the skills and resources of both the public and private sectors with a goal to properly allocate risks according to each side’s capacities. Traditionally, PPPs have been used for infrastructure provision, including transport systems, hospitals, schools, and water and sewerage systems.

One innovation in the PPPs is the emergence of availability-based payment mechanisms. This is similar to results-based payments where an entity (usually the government) pays a provider of services on the basis of the outcomes their service achieves rather than the inputs or outputs the provider delivers. Social Impact Bonds (SIBs) are an example of results-based payments.

In the context of PPPs, availability-based payment mechanisms are long-term contracts where the private sector is allocated for the responsibilities of designing, building, financing, and maintaining (DBFM) a public project. In return for their services the private sector is reimbursed through a predetermined performance-based payment plan.

⁴⁰ African Development Bank (n.d.), List of eligible projects in the Green Bond Portfolio as of December 2019. Retrieved at <https://www.afdb.org/en/topics-and-sectors/initiatives-partnerships/green-bonds-program/portfolio-selection>

Within the context of the long-termism of availability-based payment PPPs, there is an increased understanding and appreciation of the role of NBS in protecting the world's floodplains, urban deltas and shorelines from flooding and erosion. Various types of nature-based solutions for coastal protection exist, including artificial wetlands or salt marshes, beach nourishment, oyster reef creation and mangrove re-establishment and protection. For example, artificial oyster reefs created in New York, USA and the Oosterschelde, Netherlands, achieved both wave reduction and erosion protection.⁴¹ Furthermore, NBS have the potential to offer significant co-benefits, such as increased recreational opportunities. Yet, not all examples in this chapter embrace the three climate adaptation principles advocated by WWF to avoid maladaptation. Maladaptation can occur when actions that might reduce short-term social or ecological vulnerability are making people or ecosystems more vulnerable to climate impacts over the longer term. Asset owners are encouraged to work with consortia partners that pursue a strategy of “green where we can, grey where we must”.

BOX 9. PEVENSEY BAY SEA DEFENCE SCHEME

The Pevensey Bay Sea Defence scheme in the United Kingdom was the first sea defense project anywhere in the world to be funded as a PPP based on availability payments. Commissioned in 2000, it commits a consortium of companies to a 25 year contract to guarantee a consistent standard of sea defense. It protects 9 kilometers of shoreline, protecting real estate, infrastructure, and an important wetland with Ramsar Convention status. The total amount of funding in this case was relatively modest at GBP 30 million. However, the concept has been adopted in many places around the world. This is in part because of its uptake by bodies such as the IMF and the World Bank.

UNDER A BUSINESS-AS-USUAL SCENARIO OF THE IPCC (ALSO KNOWN AS RCP8.5) THE TOTAL ACCUMULATED SEA DEFENSE COSTS BETWEEN NOW AND 2100 IS ESTIMATED TO BE BETWEEN USD 3.4 TRILLION AND USD 9.6 TRILLION

Research has shown that protecting the world's shorelines will require significant investments. Under a business-as-usual scenario of the IPCC (also known as RCP8.5) the total accumulated sea defense costs between now and 2100 is estimated to be between USD 3.4 trillion and USD 9.6 trillion.⁴² Regionally, most investment will be in developed countries, not because the need is highest but because the tax base allows governments to invest in coastal protection. New approaches will be needed to ensure that developing countries can also benefit from such investments.

⁴¹ Ecologic Institute (2015), Coastal Protection and Suds – Nature-Based Solutions.

⁴² Nicholls, R.J., Lincke, D., Hinkel, J. Pol, van der, T. (2017) Global Investment Costs for Coastal Defense Through the 21st Century.

BOX 10. FUTURE PROOFING THE AFSLUITDIJK

Consortia were invited to develop an availability-based payment PPP proposal that would future proof the Afsluitdijk, a large dike built in 1932 that protects the IJsselmeer in the Netherlands. The project must meet coastal defense criteria while at the same time create new nature, opportunities for tourism and economic activities. The 25-year contract has a net present value of EUR 550 million and was awarded in 2018. The financial partners include Aberdeen Standard Investments, PGGM and APG. These contracts are attractive for asset owners as they have long time horizons (20 - 25 years) and provide a stable cash flow, although there remains project risk if the agreed criteria are not met.

BOX 11. THE HONDSBOSSCHE AND PETTEMER SEA DIKE

The Hondsbossche and Pettemer sea dike in the Netherlands supplies a total of 35 million cubic meters of sand to create a new dune landscape. This project incorporated nature-based solutions (NBS) by designing a dune habitat allowing natural deposition of the sand along the coastline. The consortium included van Oord and Boskalis, two of the largest dredging companies in the world. The contract is based on 20 years of maintenance and is worth EUR 230 million.

To develop these innovative PPPs requires a collaborative and multi-stakeholder approach where government, private sector, and civil society must work together. In designing the Hondsbossche and Pettemer sea dike project, the government designed a collaborative process which engaged local businesses and environmental groups. As a result, the decision-making process went smoothly and the project did not incur delays, reducing risk to investors.

Although these PPPs work well in developed countries such as the Netherlands and the United Kingdom, they may be more difficult to implement in a developing country context. Such an approach requires educating local governments and other stakeholders to familiarize them with availability-based payment PPPs. Also, many asset owners do not have a mandate to directly invest in many of the countries where the need will be highest. Yet, in bringing together the right mix of partners, including export credit agencies, MDBs, asset owners, civil society, and local governments it is possible to develop similar approaches.

CHANNEL 3

Climate-Themed Investment Funds

In addition to green bonds and availability-based payment-based PPPs, new investment and lending opportunities will emerge as the need for climate adaptation-related goods and services increases, and as companies and countries invest in becoming climate resilient.

Whereas asset owners are already seeing adaptation-themed green bonds enter the market, they may have to be more pro-active when developing availability-based payment based PPPs. The same applies to climate-themed investment funds. It may require asset owners to expand their mandate to start investing in such funds. Yet, two new structures are emerging which offer new opportunities for institutional investors to deploy their capital.

Climate-Themed Equity Funds

The overall sentiment in financial markets is that climate risk is not priced into the valuation of companies. Now some investors are stepping beyond what has been the main investment response to climate change, such as investing in renewable energy. By carefully analyzing climate trends, both on the regulatory side and the physical risk side, investors can select stocks and deliver alpha.

Selecting the investments from a climate risk and opportunity perspective has two elements: firstly, identifying the physical or transition risks that are material to a company; secondly, assessing the company's capacity and readiness to manage climate risks or identify climate related opportunities.

Physical hazards arising from climate change can include drought, flooding (coastal, pluvial, fluvial), heat and cold stress, wildfires, hurricanes, and changing weather patterns. This could lead an investor to pick stocks related to water companies, or agricultural stocks that provide technologies for climate smart agriculture or irrigation techniques.

The second element relates to whether companies are prepared to capitalize on the opportunities or manage these risks. The TCFD should provide guidance on how well companies score on this metric; however, the quality of climate risk reporting is not yet sufficient to build a strong case. Therefore investors must develop their own opinion through alternative means, for example through analysis of annual reports or active engagement. Some companies are investing in climate adaptation interventions, such as a coffee plantation investing in rainwater harvesting to allow water buffering during seasonal fluctuations. Such investments may lower the risk profile compared to those companies that do not invest in building climate resilience.

BOX 12. VOLORIDGE SUSTAINABILITY FUND

A new USD 1.5 billion hedge fund called Voloridge Sustainability Fund was started in 2019 by David Vogel, a predictive modeling scientist. According to the company, "the fund will focus on companies affected by events such as floods, fires and natural disasters; firms that invest in efficient technologies; and electric-car makers and their suppliers".

Many asset owners, and their managers, have in recent times built their capacity to address climate risk. One strategy to build up capacity on climate is teaming up with a climate research center. Wellington Management, an investment management firm, created a research partnership in 2018 with Woods Hole Research Center, a nonprofit climate science specialist in the United States. The two organizations use climate science to identify metrics that matter for investing. Wellington manages over USD 1.0 trillion, and the partnership's findings will inform all the portfolios it manages.

BOX 13. NORWEGIAN SECTOR ASSET MANAGEMENT

A climate risk based trading strategy can be extended into credit markets. One example is the Norwegian Sector Asset Management, headed by Knut Kjaer, the founding chief executive officer of Norges Bank Investment Management. His investment fund will short sell so-called brown bonds, for example of coal companies. Most coal production comes from unlisted companies that are in the bond market. The fund will earn a profit of the short-sale if prices go down. But importantly for the mission of the fund, the cost of capital of the bond issuer could go up if the fund gets the short trade right.

Climate-Themed Real Assets Funds

Climate resilience is fast becoming an investment imperative in real assets, where investments are often held for 10 years or more. Investors may miss valuable market opportunities if they only consider climate risk. Investments in resilient real estate and infrastructure may offer prospects for improved financial returns as well.

Many such opportunities will arise from improving climate resilience of cities and metropolitan regions. The combination of population density and the economic importance of such areas is already putting them on the frontline of adaptation to climate change. Cities generate roughly 80% of global GDP and are home to more than half of the world's population today, a share that the United Nations projects will reach two-thirds by 2050.⁴³ Many of these cities lie in coastal areas, making them particularly vulnerable to a range of climate hazards (such as sea level rise and coastal flooding). The investments required may include coastal protections, climate-resilient construction, more robust infrastructure, upgraded transport systems, planning for managed retreat, and more.

There is the opportunity to identify investment structures that are fit for mobilizing private capital at scale, particularly in emerging markets. Given that asset owners currently have a limited mandate to invest in emerging markets, and almost no mandate to invest in frontier markets, an expanded view is necessary to see how the role of development finance will likely change.

⁴³ Goldman Sachs (2019), *Taking the Heat: Making Cities Resilient to Climate Change*.

In particular, stronger collaboration between asset owners and MDBs and DFIs can yield opportunities. The strength of MDBs and DFIs is to originate and structure complex transactions under often challenging circumstances in their client countries. Once those investments have been made, what is largely left are operational risks: will the urban transport system generate sufficient revenue to pay back the loan, will the solar energy project generate enough electricity, etc. Yet, usually MDBs and DFIs keep these loans on their balance sheets, thereby tying up capital and reducing their capacity to originate more transactions.

Most asset owners do not have these structuring capabilities, nor do they have the mandate to invest in these countries directly. But many do have the capacity to deploy capital in structures that are standardized and scalable. Combined with sufficient risk mitigants, such as providing first loss capital and risk guarantees, MDBs and DFIs can structure portfolios that can be made attractive to institutional investors, particularly in the current low yield environment.

This would go beyond the idea that MDBs such as the World Bank Group can act as a clearinghouse to marry the supply of private capital and infrastructure in emerging markets. This would still not remove some of the existing barriers that asset owners face, such as currency risk, construction risk, and regulatory uncertainty. This means that MDBs and DFIs must become more innovative to crowd in private capital.

One example of what such fund structures could look like has been developed by FMO, the Dutch development bank (see textbox).

BOX 14. DUTCH FUND FOR CLIMATE AND DEVELOPMENT

In 2019, WWF started cooperating with FMO, Climate Fund Managers (CFM), and SNV Netherlands Development Organisation (SNV) to manage the newly established EUR 160 million Dutch Fund for Climate and Development (DFCD). Of this total, EUR 75 million will be invested in an innovative whole-of-life fund structure called Climate Investor Two (CI2), managed by CFM. The CI2 fund comprises of three distinct but interlinked funds to help developing countries build climate-resilient economies:

1. Development Fund (funded by donors).
2. Construction Equity Fund (funded by donors, DFIs and institutional investors) .
3. Refinancing Fund (funded by institutional investors).

CI2 will focus on water, oceans and sanitation sub-sectors, including:

1. Municipal and industrial water and wastewater supply.
2. Desalination.
3. Bulk water supply.
4. Waste and wastewater to energy.
5. Riverine and coastal ecosystem management and protection.

The goal is to adopt a 'landscape' strategy for deal origination and execution.



6.

RECOMMENDATIONS FOR ASSET OWNERS

WWF believes that scaling up financing for climate adaptation is imperative and that asset owners should start incorporating climate adaptation to address climate risk of portfolios and increase benefits for nature and people.

International climate adaptation finance is still dominated by public sector funding. Yet, the scale of financing required means that public funding alone will not be enough. This presents a new investment opportunity for asset owners, while also offering the opportunity to mitigate growing climate risks.

Many asset owners are taking steps to assess, prioritize, and manage climate risks in their portfolios. Much attention thus far has focused on carbon footprints and aligning portfolios with the Paris Agreement, but asset owners are encouraged to develop a broader perspective on climate risk, including physical risks and how integrating natural capital in investment decisions can hedge investors and investees against these risks. WWF tools such as the Water Risk Filter could assist asset owners in this process.

To create or to scale these adaptation investment opportunities, the public and private sector should build new partnerships to define the right instruments that will crowd in private capital for climate adaptation. Asset owners should proactively seek engagement with governments, and provide expertise on the policy incentives that can be developed. This process of co-creation is essential to develop these new markets. As for the development of the renewable energy sector, the private sector (as well as civil society) worked together with the government to establish incentive schemes that allowed investment at scale.

To create a new market for climate adaptation, all stakeholders in the climate adaptation ecosystem must look to change. Holding on to the status quo will mean that countries, companies, and citizens may under-adapt. It could lead to difficult choices such as whether to invest in adaptation to rising sea levels or plan for managed retreat. These trade-offs can foster further inequality, between countries and within countries, as those groups that need the funding the most are the least likely to participate in the decision-making process or receive benefits.

At the same time, if the climate adaptation market does not take a holistic and collaborative approach while exploring potential nature-based solutions at a landscape scale and addressing the interests of a wide body of stakeholders, maladaptation may mean that risks and challenges are prolonged or only change shape, rather than providing long-term solutions.

Climate adaptation finance presents a great investment opportunity, but in some cases, these opportunities need to be created. The recommendations below aim to inform and inspire different actors in the financing of climate adaptation to step up their involvement. One challenge in establishing recommendations is the diversity in resource capacity, sophistication, and size of asset owners. Where some asset owners may have started developing internal resource capability on topics such as climate, others may be relying on external expertise, and still others may not be dedicating any resources to the topic yet. There are asset owners with mandates explicitly excluding emerging markets, while others may be limiting emerging market investments due to general expectations or the need to balance portfolio-level risk profiles. Larger asset owners may have capacity to work towards creating new investment opportunities, while smaller asset owners may benefit from greater

flexibility. WWF is cognizant of the fact that asset owners must abide by their internal investment mandates and procedures and cannot simply jump on any new opportunity. The recommendations below therefore focus on channeling investment opportunities into instruments that are widely understood by the investment community while bearing in mind that asset owners may have to broaden their mandate to capitalize on them.

Following are seven practical and tangible recommendations to work towards these objectives.

LEARNING AND SEEKING ADVICE



1. Educate across the organization on climate risks and climate adaptation

Empowering investment teams to identify climate risks will enable bottom-up risk mitigation and adaptation efforts. Enabling executives with a deeper understanding of risk exposure will improve governance and mobilize collective effort towards risk mitigation and opportunity identification.

The default starting point for training and capacity building on climate risk is often an ESG or Responsible Investing division. However, this education should extend across as well as up and down the organization, including account management and business development teams. Climate risks and opportunities intersect with decision-making across the organization, at all levels.

At the operational level, investment teams should be trained to recognize indicators of significant climate risk, to know when to seek further support and information. For example, some investors in real estate and mortgage portfolios are now offloading parts of the portfolio that are in designated flood zones. Potential buyers may not be aware of these risks if they do not recognize such indicators.

At the executive level, transparency on climate risk and improved governance around climate risk are increasingly demanded by investors and regulators. Yet, senior management, investment committee members, and members of the Board often have little understanding of how and where the organization is exposed to climate risk. Embedding transparency and ensuring governance of climate risk factors requires executives to understand the risk and lost opportunities of not acting. Such education can be done through training, seminars, and reading reports such as these.

2. Establish partnerships to gain a deeper understanding of the existing science, develop practical applications, and identify new research questions

Climate science, understanding current and projected climate impacts, landscape approaches, and nature-based solutions are areas of deep expertise that may be difficult or expensive to develop internally.

New partnerships between asset owners and climate change knowledge institutions offer opportunities for learning and developing new knowledge questions. In particular, the nature of climate adaptation increases the need for data, especially asset-level data. Traditionally, the users of climate data have been governments for use in adaptation planning. Therefore, much of the data is currently designed for use in the public sphere. Yet, the financial sector has different needs and uses of this data; for example, climate hazard data must ideally be translated into financial metrics such as value-at-risk, probabilities of default, or loss given default.

Not all asset owners can engage one-on-one with such climate change research institutes. Platforms such as CERES,⁴⁴ CDP,⁴⁵ the Institutional Investors Group on Climate Change (IIGCC),⁴⁶ or the collaborative format of the Coalition for Climate Resilient Investments (CCRI) can play a role in bringing in this type of expertise. These collaborative partnerships can deliver clear value by ensuring that practical fit-for-purpose information is available to asset owners in a format which enables active management of risks and at the appropriate time. By taking a role in establishing or engaging with these multi-stakeholder partnerships, asset owners can ensure there are meaningful steps towards value generation.

This also extends to nature-based solutions and landscape approaches. There is real momentum behind these developments and significant expertise has been built up at a range of organizations, including non-profits and engineering/advisory firms. Asset owners should consider partnerships that foster cooperation and understanding of landscapes and nature-based solutions. One such partnership is the Landscape Finance Lab, established in 2016 by WWF. The Landscape Finance Lab's mission is to support governments, corporates and financial institutions to incubate sustainable landscapes that generate impact at scale. Another such partnership is IDH, The Sustainable Trade Initiative. IDH brings together public and private sector stakeholders within a landscape, often provides co-funding, and implements sustainable action plans. Private sector participants include Unilever, Tesco, IKEA, OLAM, Cargill, Mars, Mondelez, various banks, and more.

⁴⁴ <https://www.ceres.org/>

⁴⁵ <https://www.cdp.net/en>

⁴⁶ <https://www.iigcc.org/>

DECISION-MAKING



3. Develop decision-making factors that promote good adaptation strategies

Investors may invest in projects that have unintended consequences that can be harmful for people and the planet.

A good adaptation strategy takes a broader view of investment opportunities and considers network and systemic effects. Maladaptation occurs when adaptation responses are implemented with adverse or secondary consequences that outweigh the benefits of undertaking the strategy. Adaptation strategies therefore need to be developed in a multi-sectoral perspective with careful consideration of interdependent systems to avoid inadvertently increasing risks to other systems.

To incorporate this systemic view in investments and risk assessments, asset owners should develop a policy around climate adaptation. A Climate Adaptation Policy should outline the company's position and objectives in relation to climate adaptation, the strategy and instruments to achieve its objectives, and formulate a clear timeline for investees. It should not only guide the company's decision making on climate adaptation, it should also formulate a set of expectations on how investees should promote 'good adaptation' by incorporating a broader view of their activities and including the three guiding principles developed by WWF: Avoid harming nature; Use nature to help people; and Help nature adapt.

The incorporation of the EU Taxonomy includes technical screening criteria for economic activities that can make a substantial contribution to climate change mitigation or adaptation. Importantly, the EU Taxonomy provides guidance on how such activities can be implemented while avoiding significant harm to the four other environmental objectives of the EU: sustainable use and protection of water and marine resources, transition to a circular economy, pollution prevention control, and protection and restoration of biodiversity and ecosystems. This is the so-called 'Do No Significant Harm' principle of the EU Taxonomy. For example, the construction of a seawall to protect local communities against sea level rise may adversely affect coastal ecosystems. Although it may improve the defenses of the community against climate hazards, it would not be considered a good adaptation approach because of the negative consequences on nature.

4. Set a risk appetite for climate risk and develop risk-based tools to monitor investees

Asset owners need to develop resources and tools that will allow them to develop an improved understanding of climate adaptation interventions, particularly as they relate to nature.

Asset owners need to integrate climate change in their existing risk management frameworks and are advised to formulate a board-approved risk appetite. A risk appetite framework should consider all the material

climate risks to which the asset owner is exposed, and it is important that the risk appetite framework aligns with the strategic planning horizon. Climate Risk frameworks should incorporate nature loss as a critical factor, since nature loss decreases climate resilience, and climate change aggravates the drivers of nature loss.

From this follows the need for asset owners to develop tools that will allow monitoring of climate risks and the extent to which climate adaptation interventions are adequate and nature-inclusive at investee companies. Such tools should include climate scenario analysis as well as approaches to bottom-up climate risk analysis. The use of climate scenario analysis is an exploratory exercise based on plausible future situations, helping to quantify exposures to physical and transition risks and to assess resilience. This is not an easy undertaking; a major challenge is counterparty-level data availability.

Not all data providers are transparent about the source of climate data and how this data translates into impact. According to the Network of Central Banks and Supervisors for Greening the Financial System (NGFS) “today’s macroeconomic models may not be able to accurately predict the economic and financial impact of climate change”,⁴⁷ which the NGFS has sought to remedy with the publication of Climate Scenarios.⁴⁸ A range of service providers offer to screen investment portfolio’s on physical climate risk; however, these tools are often a ‘black box’ and can provide a false sense of security. Asset owners are advised to do detailed due diligence on their service providers and should ensure that they fully understand the product on offer. Where possible, asset owners should seek to develop approaches to bottom-up climate risk analysis, identifying opportunities to manage climate risk through adaptation measures or to capitalize on opportunities that climate adaptation may present.

Regulators overall are sympathetic to the notion that metrics and tools are evolving and that, currently, data available in institutions are sometimes incomplete. Nevertheless, they expect this to mature over time. Initially, asset owners can assess their data needs in order to inform their strategy-setting and risk management, identify the gaps compared with current data and devise a plan to overcome these gaps and tackle any insufficiencies.

5. Revise investment mandates to integrate or even prioritize adaptation opportunities, including for emerging markets

Asset owners are exposed to systemic risk; emerging markets present a significant opportunity for adaptation investment, and if these markets cannot access capital to adapt, the broader financial system remains exposed to systemic risks.

⁴⁷ Network for Greening the Financial System (2019), A call for action: Climate change as a source of financial risk.

⁴⁸ Network for Greening the Financial System (2020), NGFS Climate Scenarios for central banks and supervisors.

Only recently was a European asset owner allowed to buy bonds issued by the World Bank, enabling them to achieve exposure to climate adaptation without substantially changing the risk profile or investment strategy of the organization. Other asset owners are looking to gain exposure in Venture Capital, investing in startups that may yield global-scale solutions for climate adaptation.

Current mandates of asset owners may offer limited ability to become exposed to emerging markets, yet emerging markets may struggle to adapt, exposing all asset owners to systemic risk. Asset owners should review investment classes with a view to identifying new investment opportunities or broadening the definition of existing ones, to enable exposure to climate adaptation for systemic and long-term risk mitigation and opportunity realization.

The case of Green Bonds can lead as an example. Only 5 years ago, few asset owners included green bonds in their investment mandate. The green bond market was considered small and the product was not well known. As asset owners increasingly faced pressure to invest ‘responsibly’ and the size of the green bond market grew, investors updated their investment mandate and started to buy green bonds. Today there are few European asset owners that do not have green bonds in their portfolio.

As the investment opportunities such as availability-based payment-based PPPs to finance coastal defense projects and climate-themed investment funds in real assets or public markets emerge, but currently fall outside of investment mandates, asset owners should follow these developments and ultimately start the internal process to include such opportunities in their investment universe.

MONITORING SERVICE PROVIDERS AND ENGAGING WITH KEY STAKEHOLDERS



6. Establish partnerships to create markets for sustainable infrastructure

There must be deeper engagement with and between governments, MDBs/DFIs, nonprofits, and other stakeholders; both in developed and developing countries, to create new investment opportunities in sustainable infrastructure with net positive impact.

Deeper collaboration between governments, MDBs/DFIs and asset owners, as well as governments across borders will be required to identify and structure investment opportunities that can enable adaptation with global impact. These partnerships can help asset owners identify existing opportunities (such as the channels discussed earlier in this report) while creating partnerships that can seek to develop innovative new financing structures to expand existing channels into emerging markets.

Partnerships for availability-based payment mechanisms

Several asset owners have developed partnerships with governments, construction companies, dredging companies and engineering companies to develop availability-based payment PPPs to finance coastal resilience projects. These PPPs are attractive for asset owners as they are generally long-dated and tend to produce a steady stream of revenue.

To enhance acceptance, successful investment models integrate solutions across stakeholder interests. Incorporating communities in developing landscape level solutions reduces risk to investors; identifying synergies with other users of natural capital can increase the economic value of the investment. Governments can look to structure opportunities for asset owners to engage, and improve approval processes for such projects for example through ‘clearing houses’ where climate adaptation projects are fast-tracked. Asset owners can actively engage in establishing criteria and internal mandates to seek and develop projects like DBFM with long-term stability.

Partnerships for climate-themed investment funds

Dutch development bank FMO led the creation of Climate Investor One,⁴⁹ an innovative investment structure that blends public and private funding. Asset owners generally do not have the capacity nor the mandate to pursue individual investment opportunities in developing countries. Development banks such as FMO, but also MDBs such as the IDB and the World Bank, specialize in structuring projects in these markets. By developing partnerships with MDBs/DFIs, asset owners can invest in de-risked adaptation-themed loan portfolios.

Intentional creation of these portfolios are de-risked through guarantees or first loss capital. To develop such deeper engagement, asset owners work through a collaborative platform such as CERES. Some examples already exist. These need to be studied further and its lessons learned must be shared with relevant stakeholders. The challenge does not lie in technicalities on how to structure such loan portfolios. The challenge is more that all parties would need to embrace change. It is therefore imperative that this course of action is supported by senior executives of the different stakeholder organizations.

7. Engage with portfolio companies to achieve climate resilience

A comprehensive approach to climate risk assessment is necessary to truly build climate resilience.

An asset owner’s climate risk profile is directly related to the climate risks of their portfolio companies and the impact these companies have on the wider landscape. It is therefore imperative to actively engage with portfolio

⁴⁹ <https://climatefundmanagers.com/>

companies to develop climate risk profiles. One obstacle to assessing portfolio-level risk is the lack of standard reporting format, making it nearly impossible to compare risk profiles of companies cost-efficiently. Working with portfolio companies that align with TCFD recommendations can be a step in the right direction; however the TCFD does not incorporate natural capital considerations nor the systemic nature of the mitigation and adaptation measures that can address climate risk.

Asset owners and portfolio companies should develop more comprehensive approaches to complement existing ones, and take a broad view of the risks caused by climate hazards while avoiding siloed evaluation of hazards and impacts. A comprehensive climate risk assessment should include both physical and transition risks. When evaluating these risk categories, it is also important to look beyond the operations of the asset itself. The TCFD recommends that upstream (supply chains) or downstream (markets) risks are assessed as well. These risks may have direct or indirect impacts on portfolio companies. For example, a brewery may have become very efficient in water usage; but if the wider community in the watershed is less water secure as a result of the brewery's activities, then maladaptation is the result. This highlights the need for a landscape approach to allow for the exchange of the various interests that are at play in the landscape.

WWF therefore recommends that asset owners engage with relevant portfolio companies to pursue a climate adaptation strategy that promotes the landscape approach, and that is in line with the three adaptation principles mentioned in this report. The following questions can assist asset owners to engage with portfolio companies:

- To what extent are climate risks understood and managed beyond their own operations?
- Are climate risks understood and managed in collaboration with local stakeholders?
- How might nature-based solutions or the landscape approach enable long-term adaptation measures to protect the natural capital that the company relies on to operate?

Asset owners have increasingly been involved in collective shareholder engagements. This allows them to share best practices and increase the impact of engagement activities. One of such efforts is by Climate Action 100+,⁵⁰ a global investor initiative to engage systemically the 160 most important greenhouse gas emitters globally. It is recommended that asset owners engage in or initiate similar collective engagement groups for climate adaptation.

⁵⁰ <http://www.climateaction100.org/>





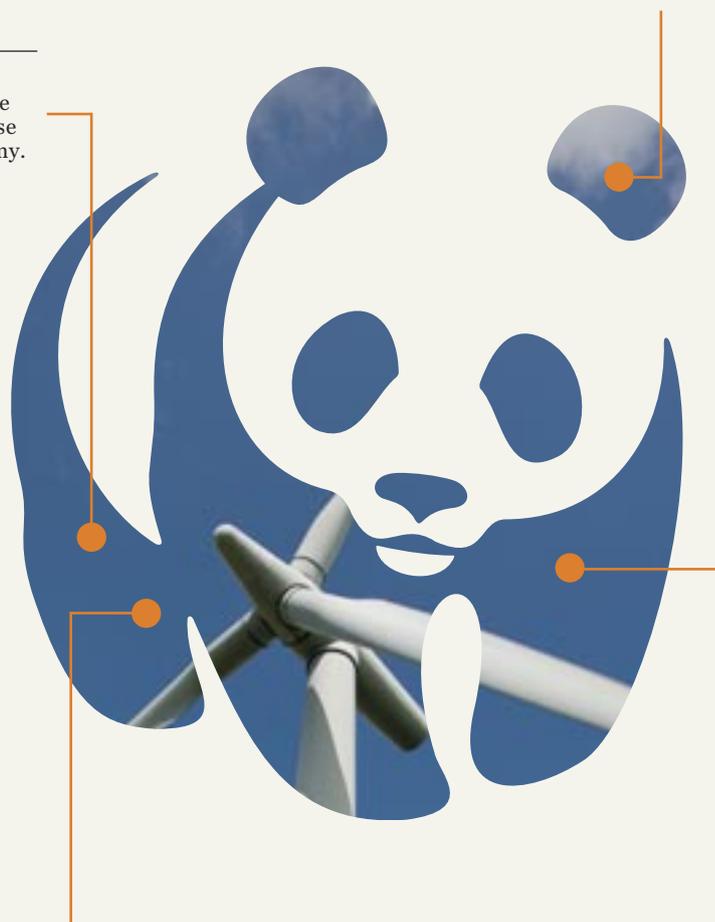
WWF CLIMATE ADAPTATION GUIDE FOR ASSET OWNERS: RISK MITIGATION AND OPPORTUNITY REALIZATION

RISKS

Climate change and its aggravating impact on the loss of natural capital pose direct risks to the economy.

OPPORTUNITIES

Asset owners should mobilize investment channels that harness the growing opportunities related to climate adaption.



JOURNEY

Asset owners should build their capacity across the organization and establish partnerships on climate risks and climate adaptation.

LEADERSHIP

Leading asset owners can be frontrunners by adopting a policy for addressing climate risks and climate adaption that ensures sustainable practices.



Why we are here

To stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature.