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CLIMATE RESILIENCE IN EMERGING MARKETS: THE UNAVOIDABLE OPPORTUNITY FOR GROWTH INVESTMENT

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CLIMATE CHANGE PRESENTS AN "UNAVOIDABLE opportunity" for growth investment in climate resilience and adaptation technologies in emerging markets.[1]

This conclusion is based on three simple recognitions:

- First, growth in demand for technologies and solutions to build resilience and adaptation to climate change is likely inevitable between now and 2030–2040, particularly in emerging markets.
- Second, there are practical ways for investors to identify climate resilience and adaptation technologies and solutions investments.
- Third, there are concrete examples of investment opportunities in climate resilience and adaptation companies in emerging markets today.

Before addressing the investment opportunity in adaptation and climate resilience, it must be recognized that **climate change is a clear and present danger and an ongoing humanitarian tragedy**. As a result of previous greenhouse gas emissions, global temperatures almost exceeded the 1.5°C above pre-industrial levels in 2023. Reinsurance experts reported US$63 billion weather disasters in 2023,[2] including a European heatwave which killed over 15,400 people and Storm Daniel, which killed at least 4,333 people in Libya.[3] The devastating floods in Rio Grande do Sul, Brazil, are another recent example of heavy casualties and financial losses caused by a climate event. As UN Secretary General António Guterres recently said, "Earth is issuing a distress signal ... Every fraction of a degree of global heating impacts the future of life on Earth."[4]

To be clear, the cause of climate change – greenhouse gas emissions – must be addressed as soon as possible.

What is also now clear is that the effects of climate change – increased risk, impact and complexity – must now also be addressed, and at an increasing urgency and scale. Also, because of their geographic location (tropical areas) and economic structure (reliance on agriculture and other climate-impacted sectors), **emerging countries tend to be more vulnerable to the effects of climate change**, with constrained budgets to address climate risks and impacts.[5]

The need to face the reality of climate change makes climate resilience and adaptation a uniquely important growth investment opportunity.

Climate resilience is a growth investment opportunity that is intertwined with and as important as decarbonization.

1. Growth in demand for climate resilience and adaptation technologies may well be inevitable between now and 2030-2040 and beyond.

Global warming will continue through 2040, creating inevitable risks and impacts to society and the planet. According to the scientists of the IPCC, "global warming will continue to increase in the near term (2021–2040) mainly due to increased cumulative CO_2 emissions...."[6] As a result, "in the near term, every region in the world is projected to face further increases in climate hazards ... increasing multiple risks to ecosystems and humans...."[7] **Brazil, for example, is vulnerable to climate change in many ways, including temperature and rainfall, extreme weather events, and sea-level rise.** The IPCC concludes: "Some future changes are now unavoidable and/or irreversible...."[8]

Risks and impacts increased by climate change will create increased demand for technologies and solutions that can assess and manage them. **The UNEP has estimated that up to US$387 billion will be required per year in developing countries alone by 2030 to support adaptation to climate change.**[9] As climate change continues to unfold, demand for technologies and solutions that can help understand, manage, recover and avoid climate risks and impacts are highly likely to increase. →

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ABOUT THE AUTHOR

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Lightsmith is a global growth equity firm that leads the first private investment fund for adaptation and resilience to climate change.

Mr. Koh has over 20 years of experience in private equity and sustainable investment. Prior to founding Lightsmith in 2016, Mr. Koh held senior investment roles at Siguler Guff, R3 Capital Partners, and The Carlyle Group, as well as OPIC (now US DFC), the US government's development finance institution. Mr. Koh chairs the Global Adaptation & Resilience Investment Working Group (GARI) and advises NYSERDA and NY Green Bank. He holds an A.B. magna cum laude in Economics from Harvard, a master's degree in Management from Oxford, and a J.D. from Yale Law School. Mr. Koh clerked for US Supreme Court Justice David Souter, and is a member of the California Bar and the Council on Foreign Relations.

→ In fact, one might argue that investors should have more conviction and certainty about the direction of climate change between now and 2040 than the path of interest rates, inflation, political elections, consumer behavior or artificial intelligence. Moreover, while the demand for technologies and solutions for decarbonization may be dependent on the path of government policy, the demand for climate resilience and adaptation will be driven by physics and time.

2. **There are practical ways for investors to identify climate resilience and adaptation technologies and solutions investments.**

Investors can identify opportunities to invest in climate resilience and adaptation today. A number of frameworks have been developed to help investors identify climate resilience and adaptation technologies and solutions. Because the effects of climate change are now just beginning to unfold, most companies and communities do not yet self-identify technologies and solutions that can support adaptation and resilience. To address this challenge, experts have developed and peer-reviewed frameworks like the Climate Resilience Investment Solutions Principles (CRISP) that can help investors and other stakeholders identify climate resilience technologies and solutions.[10] The 2024 CRISP framework aims to create **an inclusive, flexible approach to identifying potential climate resilience companies** that is agnostic to growth stage, sector, and geography.

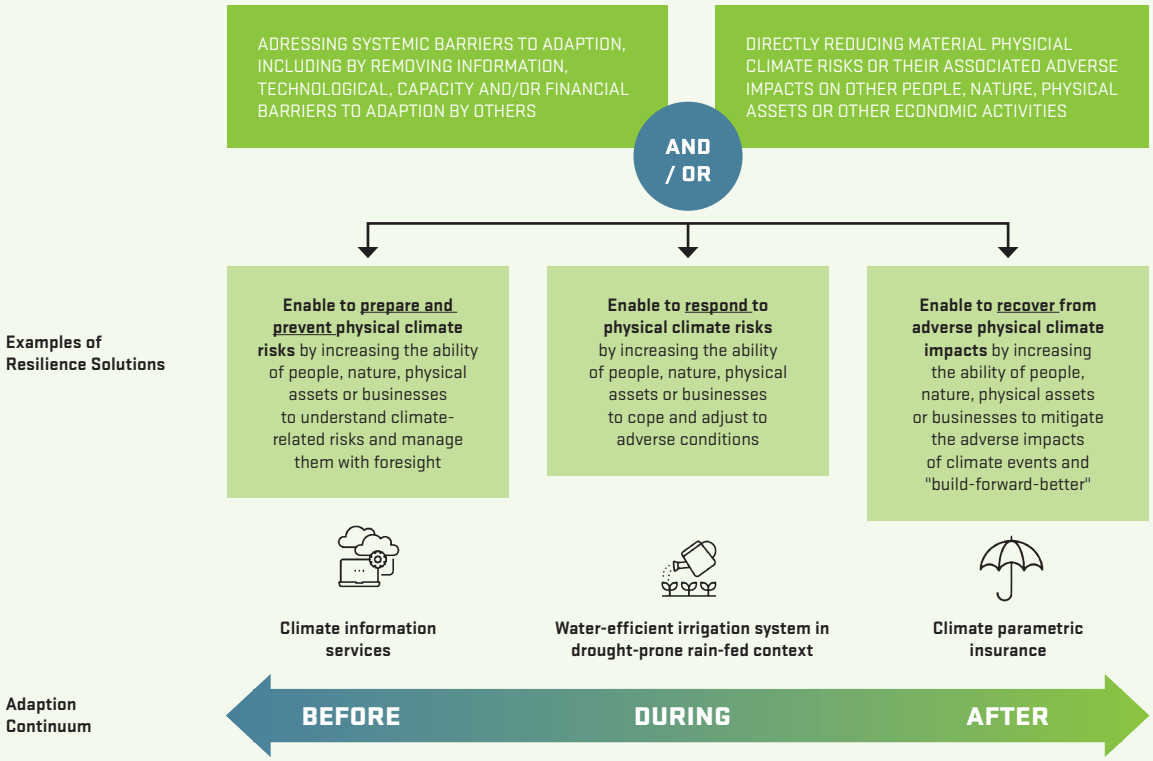
CLIMATE RESILIENCE INVESTMENTS IN SOLUTIONS PRINCIPLES (CRISP)

CRISP, for example, looks to climate science to identify specific risks and impacts increased by climate change, and then determines whether a company's technology or solution can help to understand and/or manage those risks and impacts. If a product or service can help assess climate risks, it can be described as climate resilience intelligence; if it can help manage those impacts, a climate resilience solution.

3. **Third, there are concrete examples of investment opportunities in climate resilience and adaptation companies in emerging markets today.**

Applying CRISP and other frameworks for identifying climate resilience and adaptation technologies and solutions has generated a substantial number of examples of investment opportunities ("adaptation solutions") in developing countries today.

Private equity is beginning to invest in climate resilience companies in emerging markets. For example, The Lightsmith Group, a global private equity platform that leads the first private equity fund for climate resilience and adaptation, has invested in a range of private companies in emerging markets that support adaptation and climate resilience. Lightsmith's companies include a **precision agriculture company in Brazil**, Solinftec, which networks farm production equipment and adds sensors and software to optimize agricultural productivity in an environment made increasingly complex by climate change. Lightsmith has also invested in the **Malaysian subsidiary of SOURCE Global, a company that produces "hydropanels."** These 100% renewable and sustainable panels generate pure drinking water from sunlight and air in over 50 countries around the world, addressing the increasing water stress from climate change. **In Brazil, medical diagnostics and vaccines also appear to** →



CLIMATE-RELATED HAZARDS	SOCIO-ECONOMIC AND ECOSYSTEM IMPACTS	ADAPTION SOLUTIONS *EXAMPLES*	
FLOODING	• PROPETERY LOSS • BUSINESS AND INFRASTRUCTURE INTERRUPTION	• FLOOD EARLY WARNING SYSTEMS • MANGROVES ENHANCEMENT	
DROUGHT	• CROP AND LIVESTOCK LOSS • IMPAIRMENT OF WATER QUALITY	• WATER STORAGE TECHNOLOGIES • WATER PRESERVATION TECHNOLOGIES • WATER-EFFICIENT IRRIGATION TECHNOLOGIES	
EXTREME HEAT	• CROP LOSS • FOOD SPOILAGE • HEAT STRESS ON WORKERS	• SUSTAINABLE COLD CHAINS FOR FOOD SYSTEMS • COOLING VESTS FOR WORKERS	
WILDFIRE	• HEALTH IMPACTS • PROPERTY LOSS	• AIR PURIFICATION SYSTEMS • EARLY MONITORING AND RESPONSE DEVICES	
HURRICANES / STORMS	• POWER OUTAGES • PROPERTY LOSS / DAMAGES • INFRASTRUCTURE DAMAGE / FAILURE	• GRID HARDENING TECHNOLOGIES • EARLY WARNING SYSTEMS • BUILDING ENVELOPES	• HURRICANE-RESISTANT WINDOWS • NATURE-BASED COASTAL BUFFERS • STORM WATER MANAGEMENT
SEA-LEVEL RISE	• COMMUNITY-WIDE DAMAGES • COASTAL EROSION	• DIGITAL NETWORKS • REMOTE IMAGING	• ADAPTIVE INFRASTRUCTURE • ARTIFICIAL REEFS

→ **be a key area for climate resilience investment,** as the country's cases of mosquito-borne disease, such as dengue, malaria and zika, are soaring,[11] exacerbated by increasing heat and humidity.[12]

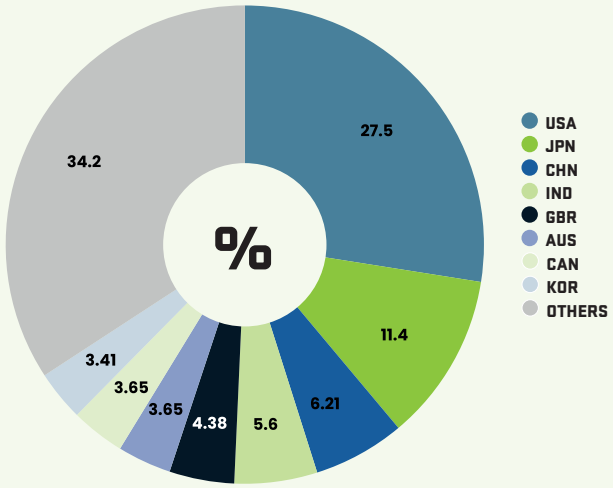
In addition, investors have opportunities in publicly listed companies that support adaptation and climate resilience. A recent paper released by the Global Adaptation and Resilience Investment working group (GARI), powered by data and analytics from **Lightsmith and the MSCI Sustainability Institute, identified over 800 companies globally that have climate resilience and adaptation technologies and solutions.**[13] Interestingly, 9.5% of the listed companies in emerging markets offered climate resilience technologies and solutions. Types of companies identified range from industrials and materials to IT, communications, healthcare and energy.

In conclusion, climate resilience and adaptation present an unavoidable opportunity for growth investment. Demand for climate resilience technologies and solutions will likely inevitably increase as climate change unfolds until 2040 and beyond. Investors can practically identify climate resilience investments in companies using existing frameworks. And concrete examples of climate resilience companies have been identified in private equity across a range of sectors in publicly listed companies in emerging markets, including Brazil.

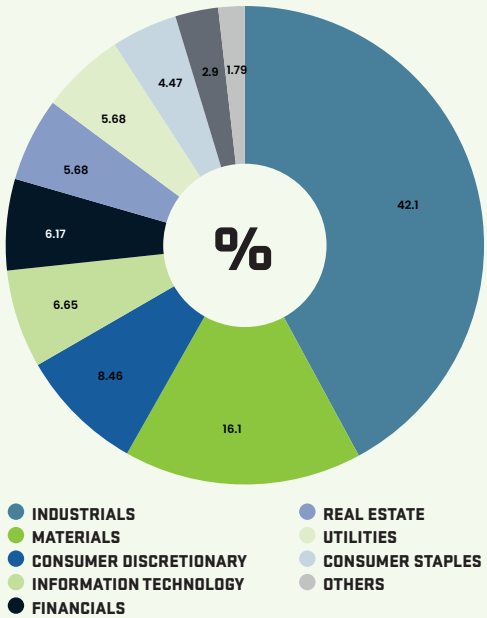
There is an unavoidable opportunity for growth investment in climate resilience and adaptation. The issue is what we will make of this opportunity.

By the time we reach 2030 – only five-and-a-half years from now – the climate will have changed. The question then will only be: what investments did we make, what technologies did we scale, what choices did we take to build resilience and adaptation to that unavoidable change? ■

RESILIENCE COMPANIES BY COUNTRY



RESILIENCE COMPANIES BY SECTOR



SOURCES

1 THIS WHITEPAPER IS BASED IN PART ON THE UNAVOIDABLE OPPORTUNITY: INVESTING IN THE GROWING MARKET FOR CLIMATE RESILIENCE SOLUTIONS (GARI, 2024). THE PAPER WAS RELEASED BY THE GLOBAL ADAPTATION AND RESILIENCE INVESTMENT WORKING GROUP (GARI) (WWW.GARIGROUP.COM) WITH DATA AND ANALYTICS PROVIDED BY THE LIGHTSMITH GROUP AND MSCI SUSTAINABILITY INSTITUTE WITH THE SUPPORT OF THE BEZOS EARTH FUND AND CLIMATEWORKS FOUNDATION.

2 HTTPS://YALECLIMATECONNECTIONS.ORG/2024/01/A-RECORD-63-BILLION-DOLLAR-WEATHER-DISASTERS-HIT-EARTH-IN-2023/#:~:TEXT=THE%20TOTAL%20COST%20OF%202023'S,DROUGHT%2C%20AND%20ONE%20WILDFIRE%20EVENT.

3 HTTPS://YALECLIMATECONNECTIONS.ORG/2024/01/A-RECORD-63-BILLION-DOLLAR-WEATHER-DISASTERS-HIT-EARTH-IN-2023/#:~:TEXT=THE%20TOTAL%20COST%20OF%202023'S,DROUGHT%2C%20AND%20ONE%20WILDFIRE%20EVENT.

4 HTTPS://PRESS.UN.ORG/EN/2024/SGSM22168.DOC.HTM

5 HTTPS://WWW.TRESOR.ECONOMIE.GOUV.FR/ARTICLES/2023/06/15/EMERGING-ECONOMIES-AND-CLIMATE-CHANGE#:~:TEXT=THE%20COUNTRIES%20MOST%20EXPOSED%20TO,THEIR%20VULNERABILITY%20TO%20CLIMATE%20CHANGE.

6 IPCC SYNTHESIS REPORT, SUMMARY FOR POLICYMAKERS (B.1.1, 2023).

7 IPCC SYNTHESIS REPORT, SUMMARY FOR POLICYMAKERS (B.2.1 2023).

8 IPCC SYNTHESIS REPORT, SUMMARY FOR POLICYMAKERS (B.3 2023).

9 ADAPTATION GAP REPORT (UNEP, 2023).

10 HTTPS://GARIGROUP.COM/NEWS?UTM_SOURCE=WWW.CLIMATEPROOF.NEWS&UTM_MEDIUM=REFERRAL&UTM_CAMPAIGN=A-NEW-BLUEPRINT-FOR-ADAPTATION-AND-RESILIENCE-INVESTING

11 HTTPS://WWW.WHO.INT/EMERGENCIES/DISEASE-OUTBREAK-NEWS/ITEM/2024-DON518

12 HTTPS://WWW.REUTERS.COM/SUSTAINABILITY/SOCIETY-EQUITY/TEMPERATURES-RISE-BRAZIL-RAMPS-UP-EFFORTS-COMBAT-DENGUE-OUTBREAKS-2024-03-12/

13 HTTPS://GARIGROUP.COM/NEWS?UTM_SOURCE=WWW.CLIMATEPROOF.NEWS&UTM_MEDIUM=REFERRAL&UTM_CAMPAIGN=A-NEW-BLUEPRINT-FOR-ADAPTATION-AND-RESILIENCE-INVESTING

ABOUT FII INSTITUTE

FUTURE INVESTMENT INITIATIVE (FII) INSTITUTE IS a global non-profit foundation with an investment arm and one agenda: Impact on Humanity. Global, inclusive, and driven by data, we foster great minds from around the world and turn ideas into tangible solutions and actions in four critical areas: Artificial Intelligence (AI) and Robotics, Education, Healthcare and Sustainability. We are in the right place at the right time: when decision-makers, investors and an engaged generation of youth come together in aspiration, energized and ready for change.

We harness that energy into three pillars: THINK, XCHANGE, ACT. Our THINK pillar empowers the world's brightest minds to identify technological solutions to the most pressing issues facing humanity. Our XCHANGE pillar builds inclusive platforms for international dialogue, knowledge-sharing and partnership. Our ACT pillar curates and invests directly in the technologies of the future to secure sustainable real-world solutions. Join us to own, cocreate and actualize a brighter, more sustainable future for humanity.

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