RESEARCH REPORT

SEPTEMBER 2015

Climate Resilience and the Role of the Private Sector in Thailand

Case Studies on Building Resilience and Adaptive Capacity

Supported by

The ROCKEFELLER FOUNDATION

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About This Report

As the threat of climate change increases, so do the risks for business; it is imperative that the private sector expands its engagement in building resilience[1] in regions and communities that are particularly vulnerable to climate change. Business has an opportunity to move beyond approaches such as "climate-proofing"[2] its operations from the physical consequences of climate-related events to those that build resilience by reducing vulnerability and enhancing adaptive capacity.[3]

Companies in climate-vulnerable locations[4] are starting to assess and prepare for the environmental impacts that climate change will have on every aspect of their operations. Our target audience is the professionals within those companies—particularly those working in the sustainability, supply chain, human resources, community engagement, risk-management, and legal departments—that are considering the operational, social, and environmental impacts of climate change on their business, as well as on their employees, their customers, nearby communities, and other stakeholder groups.

The report demonstrates the important role the private sector plays in building resilience and adaptive capacity in the face of a range of climate-related shocks and where opportunities exist for further action. We focus on Thailand, which suffered severe flooding in 2011 and faces a range of risks from climate change. Although climate change affects business and communities all over the world, the specific mandate of this report is to examine climate risks and strategies for resilience in Thailand exclusively. To highlight the different approaches business can take to resilience-building, we also provide four examples of how organizations are tackling this issue and present opportunities for future action by the business community. These examples are set in the Thai context, but they include elements that can be applied by companies working in other countries facing similar challenges.

We begin with an introduction to the concept of resilience based on a literature review, and then outline what climate change resilience looks like in the Thai context. The third chapter of the report introduces four case studies selected by BSR and the Rockefeller Foundation as best representing different approaches to building climate resilience across different industries. They are based on interviews conducted and information collected over a six-month period with representatives from each of the organizations included in the case studies, and with the Thai Red Cross Society, Li & Fung, Loxley, USAID Bangkok and the ASEAN CSR Network. We would like to thank the organizations profiled in the case studies for their review of this report for accuracy.

This report was prepared by BSR and supported by the Rockefeller Foundation. It was written by Brooke Avory, Edward Cameron, Cammie Erickson, and Paolo Fresia, with contributions from Jessica Davis

[1] Refer to page 10 for definition of resilience.

[2] Refer to page 13 for definition of climate-proofing.

[3] Refer to page 12 for definition of adaptive capacity.

[4] "Climate-vulnerable locations" refers to geographies that are the most susceptible to the impacts of climate change.

Pluess and Sissel Waage. Any errors that remain are those of the authors. Please direct comments or questions to Brooke Avory at bavory@bsr.org.

DISCLAIMER

ABOUT BSR

BSR is a global nonprofit organization that works with its network of more than 250 member companies to build a just and sustainable world. From its offices in Asia, Europe, and North America, BSR develops sustainable business strategies and solutions through consulting, research, and cross-sector collaboration. Visit www.bsr.org for more information about BSR's more than 20 years of leadership in sustainability.

ABOUT THE ROCKEFELLER FOUNDATION

The Rockefeller Foundation's mission—unchanged since 1913—is to promote the well-being of humanity throughout the world. Today, we pursue this mission through dual goals: advancing inclusive economies that expand opportunities for more broadly shared prosperity, and building resilience by helping people, communities and institutions prepare for, withstand, and emerge stronger from acute shocks and chronic stresses. To achieve these goals, we work at the intersection of four focus areas—advance health, revalue ecosystems, secure livelihoods, and transform cities—to address the root causes of emerging challenges and create systemic change. Together with partners and grantees, The Rockefeller Foundation strives to catalyze and scale transformative innovations, create unlikely partnerships that span sectors, and take risks others cannot.

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Contents

Acronyms

ADPC	Asian Disaster Preparedness Center
BAAC	Bank for Agriculture and Agricultural Cooperatives
BCP	Business Continuity Planning
CSR	Corporate Social Responsibility
DPR	Disaster Preparedness and Recovery
DRR	Disaster Risk Reduction
DRM	Disaster Risk Management
FOPDEV	Foundation for Older Persons' Development
IPCC	Intergovernmental Panel on Climate Change
IDRC	International Development Research Center
MNCs	Multinational Companies
NIAES	National Institute for Agro-Environmental Sciences
OSMEP	Office of SME Promotion
P&C	Property and Casualty
PCA	Prudential Corporation Asia
SCG	Siam Cement Group
SMEs	Small and Medium-Sized Enterprises

Foreword

Over the past few years, we have seen growing attention on the topic of resilience—from the resilience of our economies in the wake of financial crises to the ability of our cities and businesses to respond to extreme weather events such as the Thai 2011 floods—a focus of this report—or events like Hurricane Sandy.

In 2014, BSR launched our Business in a Climate-Constrained World initiative, which seeks to enable sustained private-sector leadership on climate change. Climate resilience is one of the core elements of this strategy. Our approach encompasses two ways in which we are working with business: (1) avoiding the unmanageable effects of climate change by aggressively reducing emissions, and (2) managing the unavoidable risks of climate change by enhancing adaptive capacity.

In our 2014 report, "Business in a Climate-Constrained World: Catalyzing a Climate-Resilient Future," we presented a "wedges approach" for how companies can respond to this first-mentioned challenge to reduce emissions across a range of industry clusters.

In this report, supported by the Rockefeller Foundation, we explore the topic of resilience: How communities, governments, and businesses can manage the unavoidable negative consequences of global economic, social, and political trends, within in the context of climate change, focusing on Thailand. We then delve deeper into climate resilience by providing four case studies on how the private sector is responding to and building its capacity to adapt to climate change, offering insights and lessons for other organizations.

We are also excited to launch a new framework that looks at how companies can build resilience and adaptive capacity by investing in a range of "assets." BSR proposes seven different types of assets—including physical resources such as roads, ports, or bridges and financial resources that can help communities access funds when unexpected events occur—all of which can help to build livelihoods and guard against uncertainty. This approach is truly innovative because it provides businesses with a broad menu of options they can use to enhance their own adaptive capacity and the capacity of the communities from which they draw their workers, their consumers, and the critical natural resources they depend upon for profitability. The great strength in the proposed menu is that it moves beyond traditional approaches to climate-proofing infrastructure and reveals many complementary interventions including building social capital, improving access to financial resources, deploying information and knowledge, and strengthening human rights.

The topic of resilience is a particularly significant one for BSR this year as we bring together leaders at the forefront of responsible business to share their visions of a resilient world at our annual conference in San Francisco in November.

Aron Cramer

President and CEO

BSR

Executive Summary

When the global economic crisis hit the world in 2007 and 2008, not all countries were able to respond and recover equally. At the community and individual levels, those that weren't resilient fell into poverty and exclusion.[5]

Introduction to Resilience

Climate change, population growth, and resource scarcity are global mega-trends that are putting stress on 21st-century society. The concept of resilience has developed as communities, governments, and businesses gear up efforts to manage the unavoidable negative consequences of events tied to such trends. The degree to which a system—be it a society, a community, or the environment—can be resilient depends on its ability to be aware, diverse, self-regulating, integrated, and adaptive.

In the context of climate change, resilience depends largely on the degree of a system's vulnerability to a climate event. A system is vulnerable to climate change based on its 1) exposure, 2) sensitivity, and 3) adaptive capacity. For example, a woman working as a smallholder farmer in the Mekong River delta region will be more exposed to flooding risk, stands to lose relatively more of her livelihood if affected, and lacks the resources, knowledge, and institutions to support her in facing adversity and bouncing back from negative shocks. Her life conditions are relatively more likely to change for the worse and she is likely to have a difficult time recovering her lost livelihood. She is therefore more vulnerable than, for instance, a white male office-worker in an urban area of a developed country.

Climate Vulnerability in Thailand and Impacts on the Private Sector

In 2011, the worst floods in more than 50 years struck Thailand's central and northeast regions, disrupting all elements of business and society. The floods had crippling impacts on the private sector, in particular the manufacturing industry: Thailand is a host country for many of the world's global manufacturing supply chains. Electronics manufacturers were significantly affected by the disaster: The production of information and communications equipment declined 73 percent in the wake of the flooding.

Thailand's vulnerability to climate change and the impacts to business can be examined by looking at the country's level of climate change exposure, sensitivity, and ability to adapt or respond to climate events.

Exposure: Factors leading to Bangkok's flooding in 2011 included excessive rainfall, urbanization, high tides, insufficient drainage and flood protection systems, land subsidence, the possible role of sudden release of waters from upstream dams, and the general slope of land. This was particularly damaging to—and may continue to pose a risk for—companies operating in flood-prone areas.

[5] World Bank, 2014.

Sensitivity: Thailand is sensitive to climate change at the geographic, industry, and community levels. At the industry level, a large proportion of Thailand's GDP is derived from agriculture, an industry highly sensitive to temperatures and rainfall. Rice is Thailand's largest commodity, and the country is the top global exporter of rice. Crop losses due to climate-induced weather events present food-security challenges both for Thailand and also for countries reliant on its exports.

Adaptive Capacity: Being able to adapt to the impacts of climate change involves having access to assets such as physical resources, knowledge, and financial resources to be able to respond in times of uncertainty. During the 2011 Thai floods, employees and the communities surrounding business operations lacked access to basic goods and services; as a result, disruptions to small or family-run businesses led to long-term damage to livelihoods. Building adaptive capacity requires significant changes to business mindsets in order to equip impoverished communities with the assets they need to be resilient.

Of the three above-mentioned dimensions of climate change vulnerability, this report focuses on adaptive capacity as a key area where businesses can build their own resilience and also support the communities affected by their operations as they react and respond to climate shocks. Readers should keep in mind that being able to adapt, however, does not reduce the extent of the anticipated impacts of climate change to communities and businesses. Rather, adaptation will help those affected get back on their feet.

Private-Sector Case Studies

As highlighted in BSR's report, "Creating an Action Agenda for Private-Sector Leadership on Climate Change,"[6] the consensus among business leaders is that climate change poses many risks to the private sector, including:

» Disrupted supply chains

» Reduced availability of scarce natural resources

» Damage to vital infrastructure and utilities

» Disrupted transport and logistics routes

» Heightened price and market volatility

» Unpredictable impacts on the workforce and consumers

Given these risks, there are two main kinds of adaptation activities that the private sector can take part in:

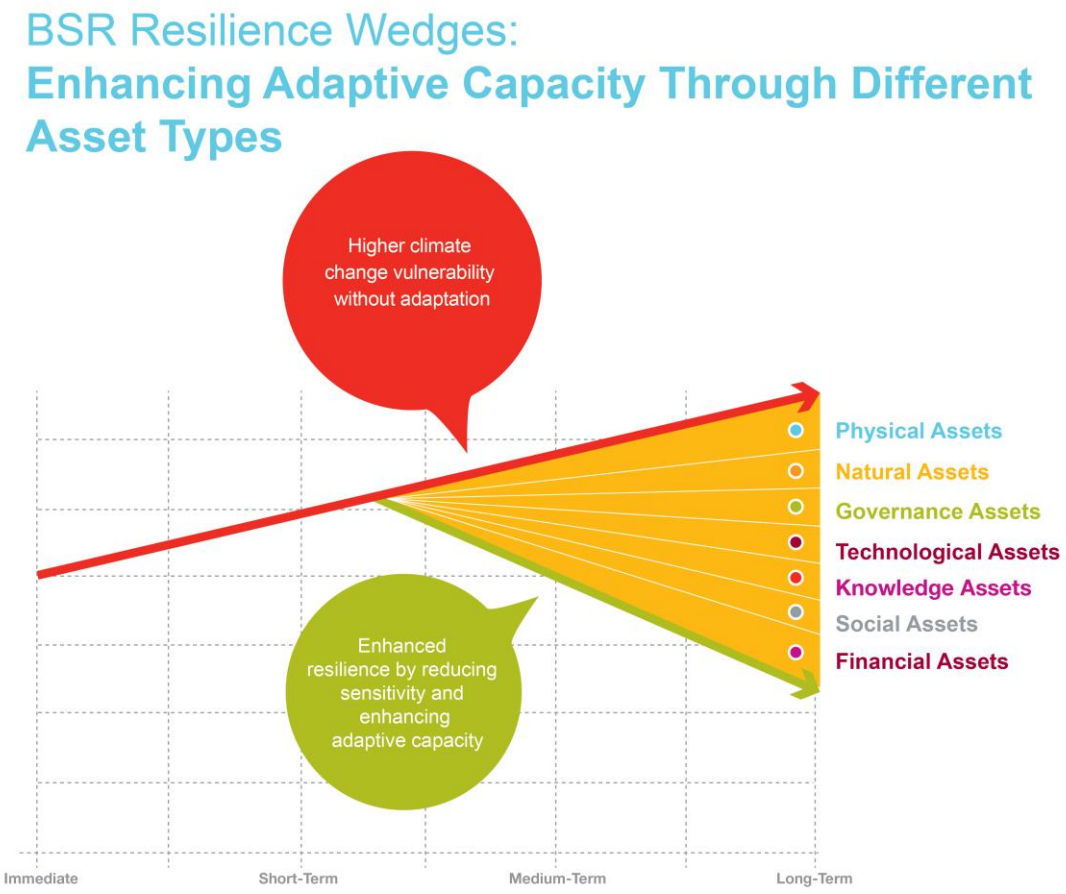
» "Climate-proofing" the business from the physical consequences of climate-related events by for example reinforcing infrastructure to withstand extreme events and building flood defenses to withstand sea-level rises and flooding.

[6] Cameron, E., et al., 2015.

» Building resilience by reducing vulnerability and enhancing adaptive capacity. Some examples include providing timely information on meteorological data, building capacity and knowledge on what to do when disasters strike, improving access to finance for rebuilding following disasters, and empowering marginalized communities including women, migrant workers, the urban poor, indigenous peoples, the elderly, and children, among others.

To build adaptive capacity, companies can invest in the maintenance or restoration of many kinds of assets, whether they are physical, natural, governance, technological, knowledge, social, or financial. BSR uses a "Climate Resilience Wedges" model to show the relationship between the different asset types and how they can enhance climate resilience by reducing sensitivity and enhancing adaptive capacity.

Figure: BSR Climate Resilience Wedges



Physical Assets: The vital infrastructure needed for development such as roads, ports, bridges, public utilities, and markets. This wedge includes the essential tools needed to sustain livelihoods, including fishing vessels and farm equipment.

Natural Assets: The life-sustaining services provided by biodiversity and ecosystems. This wedge includes provisioning services such as the supply of food, water, minerals, medicines, construction materials, and fibers; regulating services such as those that control climate, irrigation, disease vectors, and wastes; cultural services such as those that interact with human spirituality and provide recreational, artistic, and aesthetic benefits; and supporting services such as those that provide assistance with nutrient cycles and crop pollination.

Governance Assets: Access to decision making, information, and justice; actions to respect, protect, and fulfill human rights; and a commitment to the rule of law. These measures in combination are vital to creating an environment that enables political, legal, and policy efforts geared toward resilience-building.

Technological Assets: Access to information and communications technology (ICT)—such as hand-held devices for mobile telecommunications—and localized information on climate impacts. These assets can provide vulnerable populations with vital information on growing seasons, early warning systems to prepare for rapid-onset climate risks such as extreme weather events, and access to financial assets through mobile banking systems.

Knowledge Assets: The provision of information and training that is often a gateway to building other asset classes. Effective training can prepare communities for and help them rebound from external shocks. Access to information has aided communities to structure farming, building, land-use, fishing, and other practices in the face of climate impacts.

Social Assets: The benefit derived from cooperation between individuals and groups, typically referred to as "social capital." Enhancing trust and communal bonds builds networks of support that vulnerable groups can use when faced with risks. These support networks can be used to strengthen political voice, to share limited resources, or to mobilize collective responses when disaster strikes.

Financial Assets: The availability of the financial products and actual finance that enable investments in resilience and responses to risk. For example, access to credit enables populations to buy the tools and resources that grow livelihoods. Access to insurance enables populations to hedge against the risk of a contingent, uncertain loss, particularly those associated with climate change. And access to banking services enables populations to save and have access to cash reserves when losses do occur.

Four organizations in Thailand are using their core business resources, products, or expertise to build the adaptive capacity of their own operations, other businesses, or the communities where they operate:

Summary of Private-sector Case Studies

Organization	Asset Type	Overview
Sompo Japan Nipponkoa Insurance	Financial	Sompo developed weather-derivative insurance products for rice farmers in northeast Thailand that would provide them with income stability if rainfall over a predetermined period falls below a predefined level.
Fujikura	Physical	Fujikura developed its physical assets, its manufacturing facilities in Thailand, to help mitigate the impacts of climate change and make the facilities more climate-proof. They also integrated climate risk into their business-continuity planning to help build the resilience of their operations.
Prudential	Social and Knowledge	Prudential partnered with a local Thai nonprofit, FOPDEV, to equip vulnerable elderly citizens in northern Thailand with the knowledge and skills to be disaster-response leaders in their communities. This approach helped the elderly create stronger bonds among different groups in their communities, supported by Prudential's network of employees and agents, who provided training and awareness-raising activities about disaster preparedness.

Asian Disaster Preparedness Center (ADPC)	Knowledge	Through its iPrepare Business facility, ADPC is teaching SMEs in Thailand how they can make their businesses more resilient in the face of climate change as well as educating SMEs about the business case for building adaptive capacity.

Opportunities for Business Action

The risks of climate change are being made increasingly clear to the business community by extreme weather events that disrupt production, reduce access to natural resources such as water, and have deep and lasting effects on communities where the private sector operates.

The report presents a framework that companies can adopt to build their adaptive capacity to climate change in the form of different "resilience wedges" or "assets." The intention is not that companies choose one approach, but instead adopt multiple assets and pursue them together to build greater resilience to climate change, both among their own operations and the communities in which they operate.

Based on the four case studies presented in this report, along with interviews and desktop research, BSR identifies four key takeaways for business in building resilience to climate change:

» Incorporate climate change resilience-building as one dimension of risk management. For example, climate change and water security can be added as key components of corporate due diligence and risk assessment protocols.

» Take a holistic approach to building adaptive capacity that considers the relationship between the company and society, the natural resources they depend on, the people they employ, the customers or suppliers they work with, and the social license to operate granted by local communities.

» Identify opportunities to collaborate with public- and private-sector players in order to amplify the impacts of resiliency efforts.

» View increasing adaptive capacity as a business opportunity. Tracking corporate costs, investments, and return on investments (ROI) on climate change adaptation projects can help to assess and make the business case for investment over time.

As climate change impacts on the private sector become more pronounced, particularly the risks inaction poses to business continuity and long-term sustainability, developing an approach to building the adaptive capacity of a company's own operations and the communities around them will become a business imperative.

Introduction to Resilience

Resilience is the ability of individuals, communities, an economy, or the environment to rebound quickly in the face of adversity. In this first chapter, we define the key concepts of resilience, discuss what resilience means within the context of climate change, and outline potential roles that the private sector can play in building resilience. Our "wedges" model explains how facilitating maintenance of assets such as green infrastructure, knowledge, and social systems can improve resilience to climate change through building adaptive capacity.

What Is Resilience?

We are living in a world where demand for resources is outstripping supply: Increasing consumption and demographic growth coupled with often-unsustainable economic development are exacerbating water and natural resource shortages, contributing to growing wealth disparity, and making an increasing number of people vulnerable to adverse events. This set of dynamics means that the ability of individuals, societies, countries, and regions to adapt and be resilient in the face of unexpected change and instability is increasing in relevance and importance.

The Intergovernmental Panel on Climate Change (IPCC) defines resilience as: "The capacity of social, economic, and environmental systems to cope with a hazardous event or trend or disturbance, responding or reorganizing in ways that maintain their essential function, identity, and structure, while also maintaining the capacity for adaptation, learning, and transformation."

At the January 2014 Urban Resilience Summit, the Rockefeller Foundation identified three basic types of instabilities that affect a system's ability to be resilient:

» **Physical** instabilities, such as volcanic eruptions, earthquakes, and flooding

» **Social** instabilities, such as breakouts of violent civil unrest, crime, and homelessness

» **Economic** instabilities, such as economic crises, poverty, and unemployment

When individuals, communities, and institutions build resilience, it reduces the likelihood that severe disruptions, such as the instabilities above, become debilitating. It allows them to avoid and mitigate the negative setback, or to rebound more quickly after a disaster occurs.

TERMINOLOGY

What Is a System?

A **social system** could be represented by a community and the relationships between the villages or households within it. An **economic system** could be a company and its partners, suppliers, employees, and customers or an industrial zone and the businesses it supports. Lastly, an **environmental system** could include a particular biological system and the people who depend on its ecosystem services. The latter include the value farmers gain from soil quality, fishing communities gain from healthy coral reef systems, cities gain from freshwater supplies, and more.

A "resilience dividend"[7] is the idea that shocks and stresses can bring opportunities for those affected to evolve and in some circumstances transform by providing benefits under normal times, such as increased information about community services available to a family; and allowing individuals, communities, or states to recover faster, for instance by having insurance that compensates a family quickly after a storm.

A household that has invested in resilience-building that helps it to recover from its first shock—the devastation of their home by a typhoon—will reap a resilience dividend over a family who has not made the same investments and are forced to sell what few assets they have left after the typhoon to survive. For the unprepared family, their recovery time becomes longer and they are made more vulnerable to the next shock and falling into poverty.

Five elements can affect the degree of resilience of a social, environmental, or economic system:

» **Aware**: Knowing and constantly assessing the strengths, assets and vulnerabilities you have and the threats you face. Absorbing new information through sensing, information gathering, and feedback loops.

» **Diverse**: Surplus capacity to operate under a diverse set of circumstances. Being diverse means that the system can possess or draw upon a range of capabilities, information sources, technical elements, people, or groups.

» **Self-regulating**: Continuing to function and to deal with interferences without collapsing—to "fail safely." A self-regulating system can withstand disruption, won't exacerbate the effects of a crisis if it fails, and is more likely to return to function quickly once the crisis has passed.

» **Integrated**: Sharing information transparently across entities, collaborative development of ideas and solutions, and communication with people and entities that are involved or affected.

» **Adaptive**: Constantly and flexibly adjusting to changing circumstances during a disruption by developing new plans, taking new actions, or modifying behaviors so that you are better able to withstand and recover from a disruption.

[7] Rodin, J., 2014.

Underpinning all five characteristics is the notion of inclusion, whereby all people and places are equally able to access—physically, financially, and socially—the resources, services, and decision-making processes that influence their lives.

Resilience in the Context of Climate Change

Climate change is threatening the ability of social, economic, and environmental systems to be resilient.

Among the major threats identified by the IPCC are damage to livelihoods and homes, threats to food security and development, increased incidence of poverty and conflicts, undermining human rights, and heightened public health risks stemming from climate-related diseases and fatalities. Impacts on ecological systems include loss of critical habitat, heightened risk of species extinctions, and damage to ecosystem services.

In the context of climate change, the ability of a system to be resilient is also dependent to a great extent on its vulnerability, which makes it more or less susceptible to the risks associated with a hazardous climate event. Vulnerability is determined by 1) the exposure to risk, 2) the degree of sensitivity toward that risk, and 3) whether there is ability to adapt and recover from the risk. For example, a woman working as a smallholder farmer in the Mekong River delta region will be more exposed to flooding risk, stands to lose relatively more of her livelihood if impacted, and lacks the resources, knowledge, and institutions to support her to face adversity and be resilient to negative shocks. She is therefore more vulnerable than, for instance, a white male office worker in a developed country.

» **Exposure** refers to the presence and location of people, livelihoods, environmental services and resources, infrastructure, or economic, social, or cultural assets in places that could be adversely affected by physical events and which are therefore subject to potential future harm, loss, or damage. For example, food insecurity may result from global market changes driven by drought or floods affecting crop production in another location.

» **Sensitivity** is the degree to which a system is affected by or responsive to positive or negative stimuli. Sensitivity is a result of diverse historical, social, economic, political, cultural, institutional, natural resource, and environmental conditions and processes. For example, a society that has experienced frequent changes in government affecting governance at the community level is going to be more sensitive than a society with a stable political environment and clear systems for participating in local decision-making.

» **Adaptive Capacity** refers to the combination of all the strengths, attributes, and resources available to individuals, communities, or organizations within social and economic systems that can be used to achieve established goals in the face of adversities. This includes the conditions and characteristics that permit society at large (institutions, local groups, individuals, etc.) access to and use of social, economic, psychological, cultural, and livelihood-related natural resources, as well as access to the information and the institutions of governance necessary to reduce vulnerability and deal with the consequences of disaster.

Adaptation, or adaptive capacity, is an important component of both building resilience to any kind of shock or stressor, such as physical, social, or economic stressors, and a key component of building resilience to climate change.

The Role of the Private Sector in Resilience-Building

THE BUSINESS IMPERATIVE TO ADAPT

In order to limit the impacts of climate change, climate resilience will require continued, aggressive GHG emissions reductions to limit and potentially avoid the unmanageable impacts of climate change (climate change **mitigation**), and comprehensive approaches to reduce vulnerability to the unavoidable impacts that climate change is already having (climate change **adaptation**).[8]

The goal of climate change mitigation is to slow down the rate of climate change at a global level by reducing GHG emissions. In BSR's signature climate change report, we describe the steps, or actions, that companies in various industries can take and that, when combined, can add up to the level of ambition needed for climate mitigation.[9]

Despite the importance of mitigation, many of the climate impacts that we will experience over the next several decades are already unavoidable and therefore individuals, communities, and companies alike will need to find ways to respond and adapt. While 75 percent of BSR member companies are acting in some form on climate change, as evidenced by their responses to the Carbon Disclosure Project (CDP),[10] such action remains limited mostly to taking steps to reduce emissions. Fewer businesses are working on adaptation and, when they do so, it is often from a risk-management perspective aimed at tactically avoiding the worst-case scenario impact of climate events, rather than tackling the root causes of vulnerability. Those root causes are often of a social, systemic, and complex nature rather than a matter of building additional infrastructure or adjusting business models, and hence potentially perceived to be harder for the private sector to influence alone. However, there are ways in which a business can adapt and build adaptive capacity in the societies where it operates.

HOW CAN BUSINESS ADAPT TO CLIMATE CHANGE IMPACTS

Companies can tackle adaptation in a variety of ways. These include a firm's internal operations, interactions with other actors in its supply chain, and activities that involve a broader range of stakeholders, including industry associations, government, civil society, and the larger community. "Enhancing adaptive capacity" by business involves changes in processes, practices, or structures to moderate or offset potential damages or to take advantage of opportunities associated with changes in climate. There are two main approaches to enhancing adaptive capacity:

» **"Climate-proofing**" or interventions in infrastructure that attempt to minimize the consequences of exposure to climate change risks, e.g., flood defenses or seawalls. This approach may address the symptoms rather than the root causes of vulnerability. It can also be viewed as an effort to protect physical assets.

» **Adaptation measures** or social development interventions that tackle the underlying drivers of vulnerability, including factors that make populations sensitive to climate change impacts. This type of adaptation helps build resilience not only to climate change but also to other stressors.

[8] Cameron, E., et al., 2015.

[9] Ibid.

[10] CDP, 2015.

Both approaches include balancing the availability of assets necessary for effective climate change adaptation while ensuring there is also appropriate access provided to these assets, particularly for vulnerable and marginalized communities.

There are seven major types of assets that help build adaptive capacity that we illustrate in our Climate Resilience Wedges model: physical, natural, governance, technological, knowledge, social, and financial.

From the perspective of the private sector, while some assets need to be developed by all industries, both by companies themselves and through multistakeholder cooperation, certain industries will play a larger role—and stand to benefit from greater adaptive capacity—by concentrating on helping develop specific assets or wedges. One example is how the financial services industry has begun to develop financial assets or products that can help households rebound from climate shocks.

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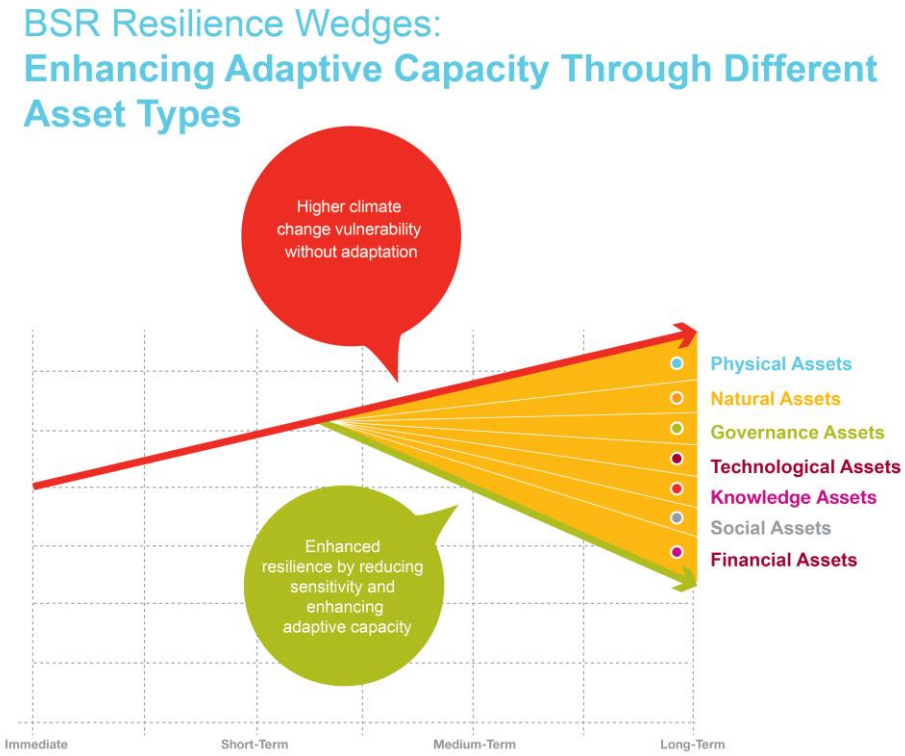
Climate Resilience Wedges

These include investments in local early-warning systems, health care and education, governance and legal reform, institutional capacity-building, gender initiatives, biodiversity and ecosystem services, and social safety nets—among others. Specifically, these include:

Physical assets: The vital infrastructure needed for development such as roads, ports, bridges, public utilities, and markets. This wedge includes the essential tools needed to sustain livelihoods, including fishing vessels and farm equipment. See the Fujikura case study in this report for further information.
Natural assets: The life-sustaining services provided by biodiversity and ecosystems. This wedge includes provisioning services such as the supply of food, water, minerals, medicines, construction materials, and fibers; regulating services such as those that control climate, irrigation, disease vectors, and wastes; cultural services such as those that interact with human spirituality and provide recreational, artistic, and aesthetic benefits; and supporting services such as those that provide assistance with nutrient cycles and crop pollination.
Governance assets: Access to decision-making, information, and justice; actions to respect, protect, and fulfill human rights; and a commitment to the rule of law. These measures in combination are vital to creating an environment that enables political, legal, and policy efforts geared toward resilience-building.
Technological assets: Access to information and communications technology (ICT)—such as hand-held devices for mobile telecommunications—and localized information on climate impacts. These assets can provide vulnerable populations with vital information on growing seasons, early warning systems to prepare for rapid-onset climate risks such as extreme weather events, and access to financial assets through mobile banking systems.
Knowledge assets: The provision of information and training that is often a gateway to building other asset classes. Effective training can prepare communities for and help them rebound from external shocks. Access to information has aided communities to structure farming, building, land-use, fishing, and other practices in the face of climate impacts. For example, teaching children how to swim has proven a vital skill in flood-prone Indonesia.
Social assets: The benefit derived from cooperation between individuals and groups, typically referred to as “social capital.” Enhancing trust and communal bonds builds networks of support that vulnerable groups can use when faced with risks. These support networks can be used to strengthen political voice, to share limited resources, or to mobilize collective responses when disaster strikes. For example, investing in women factory workers by providing them with training on sexual and reproductive health and information on health-related products and services they

can access, enhances their ability to become more secure, and also increases their resilience in the face of climate change; women are among the social groups most vulnerable to climate impacts due to their lack of resources and access.
Financial assets: The availability of the financial products and actual finance that enable investments in resilience and responses to risk. For example, access to credit enables populations to buy the tools and resources that grow livelihoods. Access to insurance enables populations to hedge against the risk of a contingent, uncertain loss, particularly those associated with climate change. And access to banking services enables populations to save and have access to cash reserves when losses do occur. See the Sompo case study in this report for further information.

Figure: BSR Climate Resilience Wedges



Optimal climate change risk reduction will be achievable if there are concerted efforts to invest in all the "adaptation wedges" or assets represented in the Climate Resilience Wedges Model.

This report focuses on the concept of adaptive capacity in the context of the 2011 Thai floods and on what four organizations are doing to build their capacity, or the capacity of others, to respond and adapt to the impacts of climate change.

Climate Vulnerability in Thailand and the Private Sector

This section outlines how Thailand is vulnerable to climate change through the lens of exposure, sensitivity, and adaptive capacity, and provides examples of how the private sector was affected by the 2011 floods and other extreme weather events.

In 2011, the worst floods in more than 50 years struck Thailand's central and northeast regions, disrupting all elements of business and society. Villages were destroyed, causing millions to become displaced or homeless, and activity at businesses, schools, and hospitals ground to a halt. Seventy-seven of Thailand's 84 provinces were affected, resulting in economic losses of more than US$45.7 billion or 13 percent of that year's GDP. While the floods drew international attention to Thailand and its ability to cope with natural disasters, they are one of many of potential impacts the country is expected to face as a result of changing weather patterns due to climate change.

The floods had crippling impacts on the private sector, in particular the manufacturing industry. Thailand is a host country for many of the world's global manufacturing supply chains, and the industry suffered losses of around US$3.97 billion or 71 percent of the total loss of real GDP. In addition to the manufacturing industry, the Thai agriculture and tourism and hospitality industries also faced significant impacts.

Gary Crawford, Vice President, International Affairs, Veolia; Gerard Langlais, Vice President, Sustainable Development, Arkema; and Emilie Prattico, Manager, Partnership Development and Research, BSR, discuss climate change resilience issues during BSR's 2015 Spring Conference in Paris.

CLIMATE CHANGE VULNERABILITY IN THAILAND

We consider Thailand's vulnerability to climate change impacts by looking at the country's level of climate change exposure, sensitivity and ability to adapt or respond to climate events.

The 2011 floods affected 77 of Thailand's 84 provinces, resulting in economic losses of more than US$45.7 billion.

EXPOSURE

According to research conducted by the USAID Mekong Adaptation and Resilience to Climate Change initiative, the northern highlands and northeastern Thailand will be exposed to and experience several major climate change impacts: increased rainfall, more frequent large rainfall events, and increases in daily temperatures of around 2 degrees Celsius. Higher mean temperatures are expected to lead to periods of prolonged droughts, exacerbated in areas like the Mekong River region that are predicted to experience reduced precipitation. Researchers have found that the 2011 floods caused such widespread impacts because of the confluence of excessive rainfall with a number of exacerbating factors: urbanization, high tides, insufficient drainage and flood protection systems, land subsidence, the possible role of sudden release of waters from upstream dams, and the general slope of land.

> During the floods, the business' logistics systems did not work, material could not be delivered, products could not be distributed, and employees could not get to work … We recognized the problem as a lack of knowledge, expertise, and experience to do business-continuity planning as well as a lack of common standards and practical principles.
>
> —Ms. Kumpa, Deputy Secretary-General of Thailand's National Economic and Social Development Board

Private-Sector Exposure: Changing weather patterns and extreme weather events can directly affect industries that are highly dependent upon the natural environment, such as agriculture and fisheries. Industries located in low-lying areas, such as much of the Thai manufacturing industry, are also vulnerable in terms of their exposure to high rainfall. To take the manufacturing industry as an example, in 2011 the floods severely affected the production of vehicles, car components, cameras, analog and discrete semiconductors, and hard disk drives. Production in the transport equipment industry reduced 84 percent while the production of information and communications equipment declined 73 percent. According to research conducted by the Bank of Thailand, prior to the floods, businesses tried to reduce their exposure to climate change through moving machines, goods, and raw materials to higher areas or flood-proofing premises. The companies affected employed a number of measures such as salvaging damaged equipment, relocating production to unaffected areas, or sourcing or importing raw materials from other suppliers.

SENSITIVITY

Thailand is sensitive to climate change at the geographic, industry, and individual levels. To take individual-level sensitivities as an example, the elderly are among one of the most vulnerable groups in times of climate-induced extreme weather events. They are susceptible to heat stroke in times of high temperatures, and stress and malnutrition in times of natural disasters, often facing challenges in reaching healthcare services.

A 75-year-old peri-urban woman interviewed by the World Bank in their 2011 report on the Thai floods described her difficulties in the following way: “My husband died years ago, I have no children, I live with my handicapped brother. I am old so I can only attend to my small rice shop and grow some vegetables at the backyard (for consumption and selling). But now my rice shop is flooded and I have no money to buy new stock (of rice). My vegetable garden was also flooded, so now I have to use money to buy everything. My only income now is 500 baht (Elderly Living Allowance) from the government.”

Sensitivities to climate change also make Thailand more likely to suffer negative “flow-on effects” such as:

» **Increases in diseases**: Increased temperatures, flooding, and rising sea levels in Southeast Asia are likely to make disease outbreaks more prevalent, especially waterborne diseases. In September 2008, more than 200,000 people in northern Thailand were diagnosed with waterborne diseases after 19 days of heavy flooding.

» **Displaced communities resulting in new immigrants and refugees**: A 2013 UN study observed that rainfall had a direct relationship with household migration decisions, particularly where individuals have high dependence on rain-fed agriculture and local livelihood diversification is low. In 2012, 40 percent of Thailand’s population was employed in agriculture, making this group particularly vulnerable to rains and increasing the likelihood of climate-induced migration.

» **Heightened social and class-related tensions within and outside Thailand**: Water management becomes a crucial issue in times of water shortages, and climate change is likely to create frictions between Thailand and its neighbors over a number of issues, including water management, refugee settlement, and energy policy. For example, low water supply in Thai dams has been the source of

tensions between Thailand and Chinese dam operators. At the household level, water shortages during the dry season can lead to restrictions on household water use, energy, and irrigation.

Private-Sector Sensitivities: Thailand derives a large proportion of its GDP from agriculture, an industry highly sensitive to temperatures and rainfall. Rice is Thailand's largest commodity, and the country is the top global exporter of rice. Crop losses due to climate-induced weather events present food security challenges for Thailand as well as for other countries reliant on its exports. In early 2015, a drought affected the central, southern, and northeastern regions of Thailand, affecting the agricultural sector by drying up aquaculture farms in rivers and causing fisher-communities to look for other work to supplement their income.

ADAPTIVE CAPACITY

Being able to adapt to the impacts of climate change involves having the tools to be able to respond in times of uncertainty. In Thailand's first communication document to the UNFCCC in 2010, the Thai government identified agriculture, freshwater management, and coastal regions as priorities for adaptation measures. In the second communication document in 2011, adaptation to increasing climate vulnerability and extreme weather events was listed as Thailand's greatest climate challenge.

During the 2011 floods, different groups within Thai society required resources or assets to help them adapt to and recover from the flooding. For example, access to knowledge can build farming communities' adaptive capacity by equipping them with the information they need to respond to the flood effectively. In an article from the Asia Foundation, the Thai government was criticized for not providing Thai people with information from the Flood Call Centers to help them adequately prepare and respond to the disaster.

Private-Sector Adaptive Capacity: Companies in a range of sectors within the Thai manufacturing industry had their operations impacted through damage to their raw materials and flooded factories. In order to adapt and respond quickly, these physical assets needed to be protected to withstand the impacts of the floods.

In addition to the physical damage to assets, companies also faced the human impacts of flooding. Employees and the communities surrounding business operations lacked access to basic goods and services, and disruptions to small or family-run businesses resulted in long-term damage to livelihoods. Li & Fung established a "Colleague-to-Colleague Fundraising Assistance Program" to help employees affected by the floods receive financial support above what was provided by insurance policies. The program also provided a "support pack" of essential every-day items such as blankets, toiletries, and household appliances; financial support for temporary housing; assistance for rebuilding premises; and financial relief for meeting healthcare costs.

Private-Sector Case Studies

In this section, we describe why climate resilience is important for business and present four case studies featuring different private-sector approaches to resilience-building.

As the threat of climate change increases, so do the risks for business. These risks include disrupted supply chains, reduced availability of scarce natural resources, damage to vital infrastructure and utilities, disrupted transport and logistics routes, heightened price and market volatility, and unpredictable impacts on the workforce and consumers. Some estimates put the cumulative global cost of climate change impacts as high as US$4 trillion by 2030 if we continue on the current path of greenhouse gas (GHG) emissions.

While the threats to business are clear, they present an opportunity for companies to evaluate their climate risks and develop a strategy for building resilience. This includes not only the resilience of their own operations but also the resilience of the communities in which they operate.

The model we developed for understanding human and natural systems' ability to manage the unavoidable consequences of climate change, mentioned in earlier sections of this report, involves building the assets to respond to and recover from climate impacts while empowering different groups to have appropriate access to these assets.

The following case studies provide illustrative examples of some of the ways in which the private sector is building resilience, ranging from providing financial products that enable smallholder farmers to predict climate impacts to partnerships with nonprofit organizations to help build the adaptive capacity of vulnerable groups in society. We have categorized their initiatives in terms of the different types of assets they leverage to build climate resilience:

» **Financial assets**: Sompo Japan Nipponkoa Insurance

» **Physical assets**: Fujikura

» **Social and knowledge assets**: Prudential Corporation Asia

» **Knowledge assets**: Asian Disaster Preparedness Center

Case Study 1: Sompo Japan Nipponkoa Insurance (Financial Assets)

About Sompo Japan Nipponkoa

Sompo Japan Nipponkoa Insurance Inc.—formed by a 2014 merger between Sompo Japan Insurance Inc. and Nipponkoa Insurance Company—is the largest Property & Casualty (P&C) insurance company in Japan. With more than 27,000 employees and revenues exceeding JP¥1.9 trillion (US$15.3 billion), Sompo Japan Nipponkoa offers clients a range of financial services including insurance, securities, and asset management.

Though based in Japan, Sompo Japan Nipponkoa has a strong presence in Thailand as Sompo Japan Nipponkoa Insurance (Thailand) Public Company Limited, which has 207 staff and 18 branches throughout the country.

The Impacts of Climate Change on the Agricultural Sector

According to the IPCC's 5th Assessment Report, the effects of climate change on agriculture—in particular, on crop and food production—are already evident in several countries, including Thailand. Without adaptation, climate change is projected to reduce agricultural production, and the impacts will be particularly hard felt in Thailand and the surrounding region.

The impacts of climate change on the food and agriculture industry affect a range of issues, including:

» **Food security**: Recent extreme climatic events, such as heat waves, droughts, floods, and wildfires are combining with long-term trends including rising temperatures and changes in precipitation patterns, resulting in broad and deep implications for the agricultural sector and global food security.

» **Crop yields**: Increases in greenhouse gas concentrations in the atmosphere over many decades are already affecting production of rice, wheat, and maize. Without adaptation, local temperature increases of 2°C are expected to reduce yields further.

» **Water scarcity**: Climate change is projected to reduce renewable surface water and groundwater resources significantly in most dry subtropical regions. Each degree of warming is expected to decrease renewable water resources by at least 20 percent for an additional 7 percent of the global population.

» **Labor productivity**: Decreases in labor productivity are likely in the agricultural sector, particularly for manual labor in humid climates, as a result of heat stress and vector-borne diseases.

Climate-related impacts and risks for the agriculture industry are particularly acute in developing countries. In Thailand this is particularly important because the agriculture industry represents more than 8 percent of GDP. Climate risks not only expose the vulnerabilities of farmers and pastoralists who lack resources fundamental to resilience including finance, technology and knowledge, but they also interact with existing environmental stressors such as biodiversity loss, soil erosion, and water contamination, and with social stressors such as inequality, poverty, gender discrimination, and lack of institutional capacity. These interactions compound risks to agricultural production and food security.

Resilience Wedge: Financial Assets

The impacts of climate change affect individuals and groups in different ways. Some groups, such as women or the elderly, are disproportionately impacted by extreme weather events, and the health and poverty effects of climate change. Farmers too are significantly affected, since they rely so heavily on the environment for their livelihoods.

Action Taken

By 2010 Sompo Japan Nipponkoa began to see that farmers in Northeast Thailand were suffering significant revenue losses as a result of extreme weather events and other climate impacts. There were very few insurance products available at the time to protect them against these risks; as a result, extreme weather events—such as flooding and drought—posed serious threats to their ability to economically support themselves and their families. To address this problem, Sompo Japan Nipponkoa took a significant leadership role in the insurance industry by launching a new weather index insurance product. Sompo Japan Nipponkoa developed this product in response to the increase demand it observed for financial instruments and insurance products to cover the revenue losses caused by extreme weather events.

A Sompo Japan Nipponkoa Insurance Thailand staff member explains weather index insurance products to Thai farmers.

ABOUT WEATHER INDEX INSURANCE (WEATHER DERIVATIVES)

Weather index insurance products (weather derivatives) provide compensation and/or insurance payments to farmers when temperatures and rainfall breach certain thresholds or when other extreme weather events occur. Though they initially gained popularity in the United States and subsequently spread to other developed countries, they have not been widely available in many developing countries that are most vulnerable to climate impacts. For this reason, Sompo Japan Nipponkoa's investment in these products in Thailand provides a leading example of how weather index insurance products can build the resilience and adaptive capacity for those most vulnerable to climate impacts.

1. How the Product Works

Sompo Japan Nipponkoa established three payout thresholds (early drought, drought, and severe drought) for its weather index insurance in Thailand. This meant that Sompo Japan Nipponkoa committed to pay insurance amounts to rice farmers in Northeast Thailand if rainfall over a certain period fell below each threshold. Since Sompo Japan Nipponkoa's weather index insurance is sold as a bundle with a loan from Thailand's Bank for Agriculture and Agricultural Cooperatives (BAAC), premiums are set in proportion to the loan amount. If a farmer is loaned somewhere between 10,000 and 20,000 baht, for example, the insurance premium will be about 800 baht.

2. Who Is Involved: Partners

In order to launch this product, Sompo Japan Nipponkoa relied on strong partnerships with several local organizations. One crucial partner was Thailand's BAAC, a state-owned bank widely used by Thai farmers at the time. BAAC was an especially important partner because it had deep trust from the farmer community and the Sompo Japan Nipponkoa-BAAC partnership signaled to the target beneficiaries that this product was intended to help them. Sompo Japan Nipponkoa also worked very closely with the Thai Meteorological Department and Japan's National Institute for Agro-Environmental Sciences (NIAES) to access the weather data and understand the impact that climate change had on the agricultural sector.

3. Impact

Since launching its weather index insurance in 2010, Sompo Japan Nipponkoa has created significant impact for farmers through its products. As a result, the company serves as a model for other financial services companies that are looking to leverage their technologies and products to build climate resilience for vulnerable populations.

The financial products were so popular with Thai farmers that Sompo Japan Nipponkoa was able to scale the project fairly quickly. The initial weather index insurance products were launched in northeast Thailand in 2010. By 2011, Sompo Japan Nipponkoa had expanded its offerings into five provinces; by 2012, into nine provinces; by 2014, into 17 provinces. This rapid scaling enabled Sompo Japan Nipponkoa to support a growing number of farmers and safeguard their livelihoods against climate impacts. In fact, Sompo Japan Nipponkoa's weather index insurance products launch was so successful in Thailand that the company now offers similar index insurance products in other countries, such as a product developed for banana farmers in the Philippines.

Launching, however, was not without its challenges. Sompo Japan Nipponkoa recognized quite early that it needed detailed weather data and an extensive observation network in order to build these weather index insurance products. Though the company did not have this data in house, Sompo Japan Nipponkoa was able to overcome this challenge by partnering with the Thai Meteorological Department. In addition,

once it had the data, Sompo Japan Nipponkoa had to figure out how to create a product that was both commercially viable and had the social impact it envisioned. Finally, once the product launched, Sompo Japan Nipponkoa had to market the product to farmers and encourage them to apply. The company was able to make significant progress on this by partnering with local institutions such as Thailand's BAAC, which was highly trusted by the target beneficiaries.

Key Takeaways

Extreme weather events such as drought and flooding can create significant risks for farmers that depend on agriculture for their livelihoods. Sompo Japan Nipponkoa recognized this social challenge and also seized a business opportunity by launching its weather index insurance products in Northeast Thailand in 2010. Sompo Japan Nipponkoa’s success launching its weather index insurance products serves as a strong example of how companies can design new products to build the resilience of vulnerable populations.

Case Study 2: Fujikura (Physical Assets)

Introduction to Fujikura

Fujikura Ltd. is a global, Japan-based electrical equipment manufacturing company that develops and manufactures products for the power and telecommunications, automotive, and electronics sectors. It also provides services to clients in the real-estate sector. Some examples of Fujikura's products include optical fibers, circuits, and electrical components for vehicles.

Fujikura has a presence in seven markets: North America, Southeast Asia, China, Korea, Thailand, Europe, and North Africa and has manufacturing facilities in Thailand.

The company aligns its resiliency work with its environmental portfolio, such as programs to reduce carbon emissions, and as part of risk-management activities, to maintain business continuity in times of unexpected events.

Impact of Climate Change on the Manufacturing Sector

The majority of manufacturers operate in five of Thailand's most flood-prone provinces.[11] The electronics and automotive sectors were among the worst industries hit by the floods, with the Department of Industrial Works reporting that more than 7,500 industrial and manufacturing plants were damaged by floods in 40 separate provinces.[12]

Like many manufacturers, Fujikura's exposure to the floods made it particularly vulnerable. Two climate risks[13] particularly relevant for Fujikura at the time of the floods were physical and stakeholder risks.

Risk Types Facing Fujikura

Risk Type	Description	Relevance to Fujikura
Physical Risk	The impact of abnormal weather on assets and operations. This includes direct impacts such as damage to facilities and investments and disruption of manufacturing and distribution.	Fujikura's nine facilities were flooded with floodwaters of up to three meters, which caused severe damage to equipment, devices, and tanks. Office paperwork and files were also destroyed.
Stakeholder Risks	The consequences of failing to deliver on the expectations of key stakeholders.	» The majority of Fujikura's customers in Thailand were located in Rojana Industrial Park and Hi-tech Industrial Estate, also impacted by the floods. » Fujikura's Thailand facilities also exported to adjacent countries and Fujikura could not meet the demand from customers outside of Thailand.

[11] Bank of Thailand, 2012.

[12] Impact Forecasting LLC, 2012.

[13] Cameron, E., et al., 2015.

Resilience Wedge: Physical Assets

Climate-proofing typically refers to interventions in infrastructure that attempt to minimize the consequences of exposure to climate change risks.[14] Climate-proofing can be classified in two ways:

» **Grey**: Investments related to the enhancement of infrastructure; these can include improvements to the delivery of water supply, alterations to road surfaces to withstand higher temperatures, and dike reinforcement for flooding and sea level rise.[15]

» **Green**: Investment in the maintenance and restoration of robust, biologically diverse, ecological structures around key supply sourcing sites, manufacturing plants, essential transport hubs (or corridors), and other important business infrastructure.[16]

Climate-proofing is regarded as strengthening an individual, community or organization's physical assets to better help those assets respond to the unavoidable impacts of climate change.

Action Taken

Fujikura responded to the flood crisis by acting at the global level to strengthen internal mechanisms for managing disasters, and taking steps at the local level to climate-proof its operations.

Globally, Fujikura established a Thailand Floods and Major Risk Management Committee as part of its broader Business Continuity Planning (BCP) efforts, to oversee the handling of the flood response and the associated risks to operations. This involved conducting a review of its electronics business supply chain to identify weak spots where the company would be most vulnerable.

At the local level, Fujikura took the following actions to help strengthen the resilience of the company's physical assets to respond to the floods, and provide information to its employees to build their ability to respond:

» Installed flood prevention walls at the manufacturing bases that had suffered damage to prevent future incidents from occurring.

» Discontinued the practice of having manufacturing activities on the ground level or first floor, where flood-prevention walls could not be installed.

» Reallocated some manufacturing activities. Fujikura expanded the capacity of a factory in Vietnam, moved some manufacturing activities from Thailand to China, and established a new factory in another industrial zone that sits on high ground.

» Established a local emergency headquarters to implement flood recovery measures. This included setting up monitoring systems for floods and establishing decision-making parameters such as when they would move facilities to safer locations, based on different flood levels. Fujikura developed local procedures for flood management based on the company's global policies that could be adopted by the Thai sites.

[14] Cameron, E., 2014.

[15] Institute for European Environmental Policy et al., 2012.

[16] Ibid.

» Strengthened training and emergency drills to employees so they are better equipped to deal with the onset of natural disasters.

» Diversified the company's supplier base to spread the risk of interruptions to operations and ensure business continuity.

Fujikura's Thailand team works on flood prevention meausres at its factory in Rojana Industrial Park, north of Bangkok.

Key Takeaways

Supply chains can be particularly vulnerable to climate change and be adversely affected as a result of reduced access to raw materials; disruption to production lines; unstable energy supply; impacts on transport, physical, and other infrastructure; and increased vulnerability of the workforce to potential damage to their communities.

Climate-proofing, including BCP, was how Fujikura approached safeguarding its operations against climate impacts by investing in infrastructure to minimize loss and damage costs.

Fujikura took this approach in order to protect its Thailand operations from the floods and to establish systems and processes to prepare for other unexpected disasters or climate-induced hazards in the future. By working at the global and local levels, Fujikura also reduced its supply chain risk by diversifying its supplier base, strengthened the ability of its employees to respond to disasters, and further developed the consistency of the BCP approach across different departments and regions of the organization.

Case Study 3: Prudential Corporation Asia (Social and Knowledge Assets)

Introduction to Prudential

Prudential Corporation Asia (PCA), part of the Prudential plc group, has life insurance, asset management, and consumer finance operations across 13 markets in Asia covering Cambodia, China, Hong Kong, India, Indonesia, Japan, Korea, Malaysia, the Philippines, Singapore, Taiwan, Thailand, and Vietnam. PCA works through its network of more than 560,000 employees and agents to provide savings, investment, and insurance products to meet the needs of people across Asia.

In 2009, PCA tragically lost four employees in an earthquake in Padang, Indonesia. This tragic event led the company to make disaster preparedness and recovery (DPR) a key pillar of its community investment work in Indonesia and other countries in Asia, including Thailand.

In 2011, PCA decided to establish the Prudence Foundation to channel its regional community investments and focus on areas of critical need in the communities where Prudential has a presence. Based on the 2009 event, DPR was included and cemented as one of the Foundation's three focus areas.

The Role of the Financial Services Industry and Climate Change

PCA's core business is to provide insurance products that help communities and individuals prepare for and respond to uncertainty. The company was therefore acutely aware of the alignment between its business expertise and the needs of communities in Asia that are vulnerable to natural disasters.

Prudential describes this alignment in its 2013 Prudence Foundation report: "Insurance provides an inherent social value by helping individuals and businesses guard against risk and build financial security. The insurance industry plays a unique and important role in mitigating risk, providing financial protection for consumers while servicing their long-term savings and retirement needs."[17]

Recognizing that the majority of funding from government, philanthropic, and private-sector donors tends to concentrate on relief rather than prevention,[18] the Prudence Foundation decided to take a different approach. It focused its DPR efforts on prevention initiatives to reduce vulnerability of communities in Asia to disaster impacts so that they are better equipped to deal with disruptions that occur, and build their resilience over the long term. This would strategically apply the company's risk-mitigation principles to its community investment programs in Asia.

Resilience Wedge: Social and Knowledge Assets

Some groups in society, such as women or the elderly, are disproportionately affected by climate change-related extreme weather events. Providing these groups with access to information, steady livelihoods, financial services, and government policies that promote empowerment can build their resilience. Having access to information, or knowledge assets, on potential climate change events can enable groups that

[17] Prudence Foundation, 2014.

[18] Zillman, C., 2013.

may otherwise be unfairly disadvantaged in times of climate impacts due to their position in society or lack of education. For example, due to health reasons, the elderly may not attend community-based information sessions on disaster response to learn what to do in times of a disaster. Their age and physical health may also make them vulnerable in terms of getting to safe areas quickly during natural disasters.

The United Nations Population Fund (UNFPA) reports that the numbers of people over the age of 60 in Thailand will approach 14 million by 2025 and exceed 19 million by 2050, or 26 percent of the country's total population by 2050.[19] This indicates more than a quarter of the Thai population is likely to be disproportionately vulnerable to climate change impacts.

Social assets are also important to build resilience to climate impacts among groups like the elderly. These refer to the benefit derived from cooperation between individuals and groups, typically referred to as social capital. Where trust between different groups in society, such as the elderly and youth, or individuals within their community, can be developed and strengthened, these bonds provide networks of support that can help protect and support the most vulnerable.

When the 2011 floods hit Thailand, thousands of elderly people were stranded at home without access to essentials such as food and water.[20] The floods affected communities in both upstream and downstream regions, with impacts in downstream communities widely underestimated. A lack of investment in preparedness—i.e., information on how they could respond during natural disasters such as floods, and building the bonds between the elderly and members of their communities that were able to seek shelter—meant that the coping capacity of the elderly in the affected communities was severely limited.

Action Taken

PCA has had a presence in Thailand since 1995 and now has more than 760 employees and 2,000 agents in the country. In 2005, Prudence Foundation partnered with Thailand-based nonprofit The Foundation for Older Persons' Development (FOPDEV) to build the resilience of vulnerable and marginalized groups in northeastern and central Thailand in Chiang Mai, Chiang Rai, and Chai Nat provinces. The program also encourages the communities in these provinces to participate in monitoring local implementation of policies, especially related to income security in old age, DPR, and to expand their engagement with local authorities.

In support of the above-mentioned theory, FOPDEV identified that when a disaster hits, an "every man for himself" mentality prevails, which puts the elderly and other vulnerable groups at a particular disadvantage. Prudence Foundation partnered with FOPDEV to implement a program that would provide senior citizens with the skills to teach others about disaster response in their community. By enabling the elderly to learn and convey knowledge on disaster preparedness and prevention, they have been able to better look after themselves and others in times of disasters, become respected members of the community helping to build greater social cohesion, and act as powerful agents of change by enabling their community to be more resilient.

[19] United Nations Population Fund, 2011.

[20] Graham, C., 2011.

IMPACT: The program raised the profile of the elderly in communities in four provinces: Chiang Mai, Lamphun, Mae Hong Son, and Chai Nat; reached more than 21,000 adults; and PCA volunteers provided support to FOPDEV across four provinces. The volunteers, young agents from local communities, are also developing a broader appreciation of the value the elderly bring to society.

FOPDEV also trains local senior citizens' associations to improve their technical, operational, and management capacities to advocate for local policies promoting income security in old age and the security of vulnerable people in emergencies. In addition to building knowledge on DPR, they also develop skills to advocate for greater support from government toward longer-term resilience-building.

PCA is also working in two other ways to build resilience to natural disasters in Thailand. First, the company is leveraging its network of employees and agents who volunteer their time on an ongoing basis to participate in the program with FOPDEV. These programs focus on making home visits to promote cross-generational understanding and reduce the gap between youth and older people, re-building or repairing houses for older people in risk-prone areas, and raising awareness on disaster prevention. PCA is also working in collaboration with other companies to host a Disaster Preparedness Forum that brings together companies to talk about opportunities for partnerships to address DRR.[21]

Key Takeaways

Tackling the challenge of global climate change includes an enormous amount of ground to cover—too much for any one company or organization alone. Through the Prudence Foundation, PCA has used corporate-NGO partnerships as a means to build the resilience of the elderly in Thailand, a marginalized group who is disproportionately vulnerable to the impacts of climate change.

Partnerships can be an effective way to build the resilience of local communities where companies and nonprofits leverage their resources to address a particular resiliency challenge. In this case, FOPDEV used its understanding and experience working with the elderly poor and provided access to vulnerable elderly communities. Prudential designed a community investment program that responded to this local resiliency challenge and leveraged its network of employees and agents in Thailand to support local implementation efforts, which supported the company's commitment to mitigating risk and preparing for uncertainty in the countries where it works.

[21] CSR Asia and Prudential Foundation, 2015.

Prudential volunteers observe as members of the Fang District in the Chiang Mai province of northern Thailand develop disaster-preparedness plans.

TERMINOLOGY

Women and Human Rights

Women are disproportionately impacted by extreme weather events and the health and poverty impacts caused by climate change. Providing women with access to information, steady livelihoods, and financial services promote women's empowerment and can build their resilience. Research suggests that climate change is hardest on women, as they are often constrained by social and cultural norms that prevent them from acquiring appropriate skill sets, restrict their access to assets (including land), prevent them from having adequate access to governance (including access to decision-making and information), place them in inferior social positions, and prevent them from acquiring education and appropriate health care.[22] In the 1991 cyclone in Bangladesh, more than 90 percent of the estimated 140,000 fatalities were women; their limited mobility, skill set, and social status exacerbated their vulnerability to this extreme weather event.[23]

Climate Change and Human Rights

The interface between climate change and human rights has become a prominent area of study in recent years. In January 2009, the Office of the UN High Commissioner for Human Rights (UN-OHCHR) published a report on climate change and human rights.[24] The report was based on written and oral submissions from more than 30 states and 35 international agencies, as well as national human rights institutions, NGOs, and academic bodies. The UN-OHCHR's report clearly asserted that there is an important relationship between climate change and human rights and delineated and defined the nature of that relationship. In particular, the UN-OHCHR outlined the many ways in which climate change undermines a range of internationally protected human rights, particularly the rights of vulnerable populations.[25] Subsequent work by the Human Rights Council and a range of international scholars have highlighted how the application of human rights, particularly those associated with access to information, decision-making, and justice, can build resilience to climate impacts.

[22] Cameron, E., 2010.

[23] Banchofen, C., and Cameron, E., 2009.

[24] World Bank, 2009.

[25] Ibid.

EXAMPLE

The Role of Financial Inclusion in Building Resilience

More than 2.5 billion adults, or 75 percent of the world's poor, do not use formal financial services to save or borrow money. Helping vulnerable populations—particularly women, who are often hit first and hardest by the effects of climate change—build the financial resources they need to invest in natural, physical, and other types of assets is essential to building their adaptive capacity in the face of climate impacts.

In 2012, with a founding grant from the Walt Disney Company, BSR piloted HERfinance in India with participation from Ann Inc., Levi Strauss Foundation, Nordstrom, Primark, and Timberland. The mission of HERfinance is to build the financial capability of low-income workers in global supply chains by providing workplace-based financial education and connecting factory employees to appropriate financial services. HERfinance is part of BSR's broader efforts to empower women in the global economy known as HERproject. To date, HERfinance has reached more than 10,000 workers through a pilot program in India, with plans under way to expand to Indonesia, Brazil, and Mexico.

Case Study 4: Asian Disaster Preparedness Center (Knowledge Assets)

Introduction to ADPC

ADPC is as an independent, non-profit foundation based in Bangkok, Thailand that works in more than 18 countries in Asia to advance a Disaster Risk Reduction (DRR) agenda through the capacity-building of stakeholder groups at local, national, and regionals level across the Asia-Pacific. Its portfolio focuses on disaster risk management (DRM) capacity-building, mainstreaming DRM into national and local development, public health in emergencies, improving DRM systems and undertaking disaster risk assessments. ADPC works closely with local, national, and regional governments, governmental and non-governmental organizations, donors, and development partners.

In its Strategy 2020 road map, ADPC identified climate change as one of the main challenges confronting the Asia-Pacific region. As a result, ADPC helps governments and communities build their capacity to effectively respond to current risks and seasonal variations, and to adapt to the changing climate and the new risks it may bring. ADPC's three main lines of work are raising national and local capacities for modeling weather and climate, supporting climate risk management and climate adaptation, and promoting end-to-end early-warning systems.

Resilience Wedge: Knowledge Assets

In an earlier section of this report, we note that providing access to knowledge to help inform how different groups respond to and recover from climate change is a key asset influencing that group's adaptive capacity. Since 2007, ADPC has observed a number of barriers to private-sector action in Thailand on DRR, which mostly stem from a lack of knowledge or governance structures needed to build business resilience to climate change. These include:

» **Low awareness of and information about the risk of damage**: Very few SMEs (which make up 99 percent of enterprises in Thailand[26]) have business-continuity plans in place, demonstrating limited understanding of the economic and social impacts disasters can have on their business.

» **Little knowledge on climate and disaster resilience and the options for adaptation**: for example, about the different measures a company can take to make business operations more resilient.

» **Lack of institutional mechanisms such as a pre-agreed arrangement between a governing body or a particular government agency that promotes SME resilience to disasters**.

» **Limited financial resources to implement technical preventive and nontechnical adaptive measures**.

» **Lack of advisory and support services and incentives from the government**.

» **Lack of regulations that promote BCP or incentives for companies to implement BCP**.

[26] OECD iLibrary, 2012.

> Resilient businesses are crucial parts of safer communities and societies. The long-term economic efficiency of investment in disaster risk reduction has become very evident in recent years
>
> —Aslam Perwaiz, Department Head , ADPC

Action Taken

In response to these challenges, ADPC developed its iPrepare Business facility, an initiative to help overcome the information gap facing businesses and create awareness of how the private sector can invest in resilience-building. iPrepare Business' main goal is to increase the disaster resilience of SMEs across Asia by implementing different projects and programs and increase private-sector engagement in disaster risk management activities. ADPC seeks to train at least 500 SMEs in the target countries of Indonesia, Philippines, Thailand, and Vietnam on DRR preparedness during 2015 and 2016.

ADPC's iPrepare Business facility intends to build climate resilient companies by:

- Providing information to aid corporate decision-making on DRR, such as scientific information and data along with relevant government policies that support DRR activities.
- Building companies' capacity to use data to develop their own business continuity plans.
- Holding multistakeholder consultations, for example to bring together relevant government agencies, SME associations, banks and insurance companies, and NGOs to identify opportunities for collaboration.
- Holding forums and events that share learning from Thailand private-sector disaster-resilience initiatives and drawing lessons from global best practices on legislation, incentives, and awareness-raising efforts.
- Creating an enabling environment for business continuity and risk-informed investment for the private sector through appropriate legislation, incentive, and awareness and capacity-building.

Since May 2015, ADPC has also been supporting the Office of Small Medium-Sized Enterprise Promotion (OSMEP) at the Prime Minister's Office as well as the Department of Disaster Mitigation and Preparedness (DDPM) of the government of Thailand to improve the disaster resilience of SMEs in Thailand. The service includes direct technical support on disaster risk management, risk assessment for business resilience, business continuity management, and implementation of business continuity plans.

TERMINOLOGY

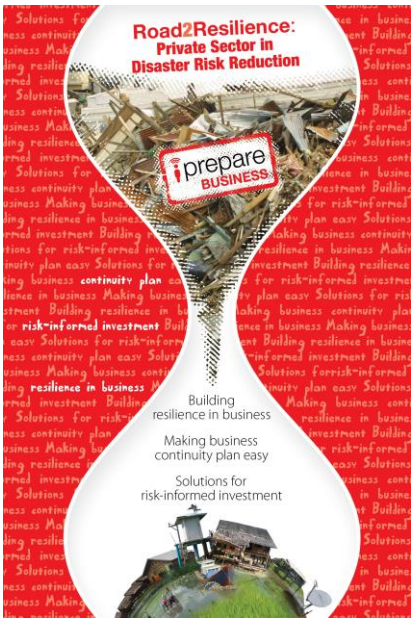
Climate-Proofing

Case studies from the Asian Development Bank's report on climate-proofing identify that adaptive capacity occurs at a number of levels: at the project or community level, at the level of sector regulation and compliance, short- and mid-term policy and planning at the sub-national level, and national strategic development planning.

ADPC's efforts in building adaptive capacity span these levels, with private-sector engagement focusing on the organizational rather than project level.

Key Takeaways

SMEs in Thailand are more concerned with short-term pressures such as attracting new customers and making sales than thinking deeply about how climate change impacts their business. MNCs or large companies with footprints in Asia are more aware of the potential for climate change to impact their business, and some companies are integrating BCP into their sustainability strategy. These companies are more likely to see the business benefits of building resiliency to climate change, however, aside from efforts to reduce GHG emissions, mitigating operational risk remains the primary driver for business investment in climate change. Companies also rarely describe this approach in terms of climate change resiliency and adaptation.



ADPC's iPrepare Business Initiative

In order to build adaptive capacity among the business community, companies need to have access to information about how they can integrate decision-making on climate risk into their ordinary risk-management or business-continuity plans, and understand the longer-term benefits of climate resilience to their business. Large companies can play a role in building the resilience of their smaller-sized peers by transferring some of this knowledge to their suppliers and other business partners.

Conclusion

The risks of climate change are becoming increasingly clear to the business community as a result of extreme weather events that disrupt production, reduce access to natural resources, and have deep and lasting effects on communities where the private sector operates. This report looks at these risks from the perspective of organizations operating in Thailand, where the 2011 floods devastated communities and the private sector alike.

The report presents a framework that companies can adopt to build their adaptive capacity to climate change in the form of different resilience wedges, or assets. The intention is not that companies choose one approach but adopt multiple assets and pursue them together to build greater resilience to climate change, both within their own operations and in the communities in which they operate.

The case studies highlighted in this report provide four examples of how some organizations are using their core business resources to build adaptive capacity to climate change. Based on the findings from these case studies, and interviews with other stakeholders in Thailand, we provide four key takeaways for business to approach climate resilience-building that apply across any geographical context:

Key Takeaways for Business

1. **Incorporate climate change resilience-building as one dimension of risk management.** Even without knowing precisely when and where climate impacts will occur, it would be wise for companies to consider likely effects of climate change in their risk planning, just as they would any other risk that includes some uncertainty. For example, climate change and water security can be added as key components of corporate due-diligence and risk-assessment protocols. This will be especially important for companies in South Asia and Southeast Asia, where climate change's direct effects on physical infrastructure, employees, and consumers is likely to present substantial challenges. We suggest companies go about this in two ways:

    » **Understand the total climate exposure and risk to the business**, starting from the direct and operational scope to the furthest reaches of the supply chain and customer communities.
    » **Map material risks and opportunities by engaging internal and external stakeholders**. Senior management will need to review and be part of the team assessing which risks and opportunities are most material and most addressable, both now and in the future.

    Fujikura has adopted this approach by integrating climate risks into its business-continuity planning.

2. **Take a holistic approach to building adaptive capacity.** Companies do not operate in a vacuum and are highly dependent on or influenced by the availability of natural resources, the people they employ, the customers or suppliers they work with, and the social license to operate granted by local communities. Companies should take a multi-dimensional approach to building adaptive capacity by considering the interrelatedness of their business to broader society. If they don't, their own efforts to build resilience are likely to be minimized.

    Prudential is using its network of volunteers and agents in Thailand, in partnership with a local Thai NGO, to building the adaptive capacity of the elderly, a vulnerable segment of Thai society, to increase their resilience to climate-induced natural disasters.

3. **Identify opportunities to collaborate to maximize the impacts of resiliency efforts.** Tackling the challenge of global climate change is an enormous task—too large for any single company or organization. All stakeholders, including business, will need to commit to bold collective action to build resilience in a climate-constrained world. This need, in turn, requires a new emphasis on collaboration,[27] which is why collaboration is a key theme throughout the case studies. Partnerships can drive effective action in the areas where businesses have the most to contribute—and to lose—through improvements to shared infrastructure, local capacity-building, and disaster preparedness and response. Companies can consider collaboration at three levels:

   » **Geographic-focused initiatives** that bring together companies from the same geographic area, within or across industries. Fujikura collaborated with other companies in its industrial zone to initiate flood protection measures that would be mutually beneficial, such as building a common flood-prevention wall around the zone.
   » **Issue-focused initiatives** created to address a specific challenge. BSR's READI initiative, which brings together companies to address shared challenges and build resilience, is an example of an issue-focused business collaboration.
   » **Industry-focused initiatives**, such as BSR's Clean Cargo Working Group, which is dedicated to improving environmental performance in the marine container transport industry through measurement, evaluation, and reporting.

   Sompo identified the Bank for Agriculture and Agricultural Cooperatives and National Institute for Agro-Environmental Sciences as partners that could help the company gain access to farmers in need of their climate insurance products, thus extending the company's reach to new customers and markets in Thailand.

[27] Cameron, E., et al., 2015.

EXAMPLE

Enhancing Resilience Through Business Leadership: Regional Adaptation Initiative

Recent extreme weather events have devastated global supply chains and communities—particularly in coastal cities in emerging economies. While these climate risks are well understood, solutions require systemwide intervention and collaboration. In early 2015, BSR launched the Regional Adaptation Initiative (READI) to bring together companies to address shared challenges and build resilience.

With a focus on making practical use of the latest authoritative climate science, READI helps companies understand their exposure to risk and how they can build adaptive capacity to address that risk.

Focusing on regional contexts, for instance, the Regional Adaptation Initiative explores opportunities for climate change adaptation in key geographical areas and drives collaborative action among companies, suppliers, and governments to invest in climate resilience. Using a science-based approach, this group seeks to identify areas of common climate vulnerability, comparing the latest climate science against company investments and commitments and collectively devising and advocating solutions in targeted regions.

4. **View increasing adaptive capacity as a business opportunity.** Companies that are taking a leadership role in climate action are already reaping the rewards, generating an internal rate of return of 27 percent on their low-carbon investments.[28] While there are fewer statistics on the business case associated with adaptation, we believe that a number of opportunities exist for businesses that take a leadership role in addressing climate change (mitigation and adaptation efforts.

   The Sompo case study, for example, shows the potential for a company to develop a new insurance product and market to meet the needs of populations affected by climate change; this development of new technologies, business models, innovative products, and market potential are applicable and equally rewarding in almost any geographic context.

   Similarly, companies that aggressively reduce their emissions and enhance their adaptive capacity through their investments, procurement, and use of energy, land, and transportation can reap significant cost savings.

[28] We Mean Business, 2014.

Tracking corporate costs, investments and return on investments (ROI) on climate change adaptation projects will help companies assess the business case over time.

ADPC's advocacy and capacity-building work among the SME community in Thailand is helping to build their awareness of the long-term business case of investing in resiliency efforts, which can enhance a company's overall sustainability.

At BSR, we believe in the transformational power of the private sector. This action has to come from companies individually as well as through collaboration within or across industries to bring about greater resilience-building.

As climate change impacts on the private sector become more pronounced, whether in Thailand or other regions, identifying effective approaches to building the adaptive capacity of both a company's own operations and the surrounding communities will become a growing business imperative, as the risks inaction poses to business continuity and long-term sustainability become more obvious.

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