



The climate risks, business impacts, and resilience assets listed in the chart are examples from the region that we gleaned from our research. They are not exhaustive across the industry or region, nor are they necessarily relevant for every business.

MANUFACTURING

Climate Risk

HAZARD

Sea-level rise • Flooding • Landslides • Salinization • Drought
Rising temperatures • Heatwaves

EXPOSURE

- The flood zone in Thailand’s growing industrial zone is projected to increase 30 percent by 2050.⁹⁴
- In Thailand, dykes, roads, and floodwalls are antiquated, limited, or put other locations at risk, exposing facilities to inundation.⁹⁵
- In Thailand, average temperature could rise as much as 4.0°C by 2100.⁹⁶
- In Vietnam, the apparel industry accounts for nearly 15 percent of GDP and a consistently increasing percentage of foreign direct investment and exports.⁹⁷
- By 2100, Vietnam’s nearly one-meter sea-level rise could affect 20 provinces, and the country could experience 95 more hot days per year.⁹⁸
- Manufacturing comprises 40 percent of Indonesia’s GDP⁹⁹ and serves as the main contributor to economic growth.¹⁰⁰
- Firms located in and around Jakarta have been significantly impacted by recurring floods;¹⁰¹ conversely, drought also affects the sector, disrupting production and temporarily closing operations in Jakarta and Surabaya.¹⁰²

VULNERABILITY

- Thailand is **highly dependent** on exports of electronics and automobiles,¹⁰³ the facilities of which are exposed to inundation, drought, and salinization.
- 99.7 percent of all businesses in Thailand are SMEs and most do **not have insurance**.¹⁰⁴
- Despite the 2011 floods, the **drainage system remains inadequate** in Ayutthaya. Communities located outside of flood walls, as well as Bangkok and Nonthaburi Province located downstream, could be inundated after heavy rainfall.¹⁰⁵
- In garment facilities, **apparel and footwear materials are sensitive** to high temperatures and humidity.
- In Vietnam, the apparel and footwear industry employs 2.5 million workers, of which **80 percent are women**.¹⁰⁶ Women are more vulnerable to climate change than men given their skills, opportunities, and responsibilities.¹⁰⁷
- **There is competing demand for water** for drinking and industrial use.
- In Myanmar, there is **inadequate infrastructure**, unreliable energy supply, and insufficient ventilation and cooling. There is also **substandard housing** for workers with limited access to water and low capacity of public health services.
- Indonesia suffers from the **lowest electrification rates** in the region, and blackouts are common throughout the country.¹⁰⁸ Flooding has caused power and communication outages, leaving tens of thousands without electricity.¹⁰⁹ Jakarta currently lacks a coordinated approach to managing floodwater.¹¹⁰

Business Impact



Strategy: Business continuity may be disrupted by manufacturing facilities located in at-risk areas.



Finances: Businesses can incur costs from damaged infrastructure and higher insurance premiums.



Operations: Severe droughts limited Bangkok’s freshwater supply in 2014-2015. This disrupted production and caused resource competition among waterworks stations, agriculture, and manufacturing.¹¹¹



Human Resources: Employees may face health risks from hot working conditions without proper ventilation or cooling.



Legal and Compliance: Businesses may need to comply with laws that limit worker activity if temperatures exceed a set threshold.



Sales and Marketing: Leading brands saw sales decline of cold-weather goods, such as jackets, boots, hats, and scarves after warmer winters—a trend that, if repeated, could alter manufacturing lines and facility production.¹¹²

Climate Resilience

CAPITAL ASSETS



Physical Capital: Invest in flood-proof infrastructure and cooling systems to keep equipment, workers, and materials safe.



Social Capital: Serve on local planning boards to build resilience in the community; protect employees’ health and roads for uninterrupted flow of goods and services; partner with local manufacturers to co-invest in building zone-specific resilience.



Human Capital: Invest in disaster response training for frontline workers and community members to prepare for and recover from more intense natural disasters. Enable experienced companies to share resources and best practices in resilience with others, including SMEs in the supply chain.