

**CARIBBEAN BUSINESS REVIEW**

Climate risk • Business continuity • Caribbean resilience

# The Compound Climate Cost

**El Niño and the Balance-Sheet Risks Caribbean Firms Must Prepare For**

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## El Niño and the Balance-Sheet Risks Caribbean Firms Must Prepare For

### Executive Snapshot

#### **The Climate Signal**

El Niño, the warm phase of the El Niño–Southern Oscillation (ENSO), is strengthening during a period of elevated regional climate stress. For the Caribbean, the current outlook points to higher-than-usual temperatures, recurrent heatwaves, significant heat stress, irregular rainfall, drought risk, and the continued possibility of flooding and flash-flood events. The business implication is clear: firms should prepare for El Niño not as a single hazard, but as a compound risk environment.

#### **The Business Challenge**

El Niño changes more than the weather. It changes the cost structure of doing business. This is the compound climate cost: the way climate-related pressures move simultaneously through energy, water, food, freight, labour, insurance, and working capital. Caribbean firms are especially exposed because many operate in small, import-dependent economies with high reliance on imported fuel, food, inputs, and goods.

#### **The Economic Stakes**

El Niño is arriving alongside wider global risks. The war in Ukraine continues to affect grain, fertilizer, energy, and commodity-market dynamics, while tensions around critical energy and shipping corridors, including the Strait of Hormuz, create additional exposure for fuel-importing economies. Climate-related disruption at maritime chokepoints, including the Panama Canal drought, shows how water stress can become a trade-cost and logistics problem. For Caribbean businesses, climate risk is therefore being layered onto existing food, fuel, freight, and finance pressures.

#### **The Cost Channels**

The most important cost channels are heat and energy demand, water stress, food and agricultural costs, freight and inventory risk, labour productivity, and finance and insurance exposure. These channels can operate simultaneously. A firm may face higher electricity bills, water restrictions, delayed imports, higher food inputs, lower worker productivity, and tighter cash flow during the same period. The ILO has also warned that El Niño-related climate conditions could reduce incomes and worsen working conditions in Latin America and the Caribbean, particularly for informal, rural and outdoor workers. The effects can

appear across the income statement, EBITDA, cash flow, inventory, receivables, debt service, and working-capital needs.

### **The Sector Exposure**

Tourism, agriculture, manufacturing, retail, distribution, finance, and insurance are all exposed, but in different ways. Tourism faces water, energy, food, labour, and guest-experience risks. Agriculture faces heat, rainfall, irrigation, livestock, pest, and input-cost risks. Manufacturing and food processing face utility, water, imported-input, and logistics risks. Retail faces inventory, refrigeration, price, and consumer-demand pressures. Finance and insurance face indirect exposure through borrower cash flow, claims, coverage gaps, portfolio risk, and demand for more climate-responsive risk-transfer products.

### **The Executive Signal**

The strategic question for Caribbean firms is not whether El Niño will affect operations, but where those effects will appear first and how quickly they will move through the balance sheet. Firms that convert climate information into management triggers will be better positioned to protect margins, liquidity, staff wellbeing, customer service, and supply continuity. The firms best prepared will not necessarily be those with the most resources, but those that understand their risk pathways early and act before those risks become losses.

### **Key Findings**

- 1. El Niño is more than a climate event; it is a business continuity risk.**

It can affect operating costs, supply chains, labour productivity, insurance exposure, and cash flow even where firms experience no direct physical damage.

- 2. The Caribbean's exposure is amplified by import dependence.**

High reliance on imported food, fuel, inputs, and goods means climate shocks can quickly become price, freight, inventory, and working-capital shocks.

- 3. Heat is both an energy-cost and productivity issue.**

Higher temperatures increase cooling demand, refrigeration loads, peak electricity exposure, equipment strain, worker fatigue, safety risks, and absenteeism.

- 4. Water stress creates both direct and indirect operating costs.**

Reduced water reliability affects agriculture, tourism, manufacturing, food processing, health, education, sanitation, and service quality, while intense rainfall and flash flooding remain important parallel risks.

5. **Geopolitical risks compound the climate-cost environment.**

Ukraine-related food and input-market pressures, Strait of Hormuz energy exposure, and climate-related shipping disruptions can amplify El Niño-related cost pressures for Caribbean firms.

6. **Sector impacts are uneven but interconnected.**

Agriculture may feel the earliest production shock, but the effects can move rapidly into food prices, tourism costs, retail margins, manufacturing inputs, credit risk, and household spending.

7. **Resilience translates active monitoring into management decision triggers.**

Firms should connect climate outlooks, drought advisories, heat alerts, reservoir levels, electricity demand notices, commodity prices, and shipping updates to specific decisions on procurement, staffing, water use, inventory, financing, and insurance.

8. **The balance sheet is where the compound climate cost becomes visible.**

The firms best prepared for El Niño will be those that identify vulnerable cost lines early, stress-test cash flow, strengthen water and energy resilience, diversify supply chains, review insurance, and assign accountability at management and board level.



## Introduction

El Niño is the warm phase of the El Niño–Southern Oscillation (ENSO), a recurring climate pattern in the tropical Pacific that influences weather conditions across many parts of the world, including rainfall patterns, temperature, drought, and storm activity. In the Caribbean, however, El Niño is not only a climate phenomenon. It is a business continuity risk.

For Caribbean firms, El Niño changes more than the weather. It changes the cost structure of doing business. This is the compound climate cost: the way climate-related pressures move simultaneously through energy, water, food, freight, labour, insurance, and working capital. Unlike a single shock event, El Niño operates as a system-wide stressor, affecting multiple cost centres at the same time. Its impacts can be felt through heat stress, water scarcity, higher electricity demand, agricultural losses, food price pressure, supply-chain disruption, labour productivity losses, insurance exposure, and new operating costs for businesses already managing thin margins and high exposure to imported fuel, food, inputs, and goods.

This is the central business issue: the weather conditions associated with El Niño can affect a company's balance sheet even without causing direct physical damage to its assets. These impacts can arrive through higher cooling costs, reduced water availability, rising food and input prices, delayed shipments, reduced worker productivity, higher insurance costs, or tighter working capital. It can also compound existing vulnerabilities in economies still recovering from severe weather events, infrastructure disruption, household income pressure, and fiscal constraints.

The strategic question for Caribbean firms is therefore not whether El Niño will affect operations, but where those effects will appear first, how quickly they will move through the cost structure, and whether management systems are prepared to respond before climate risk becomes commercial loss.

## 1. The Climate Signal

The current regional climate signal is significant. The Caribbean Climate Outlook Forum (CariCOF), coordinated by the Caribbean Institute for Meteorology and Hydrology (CIMH), indicates that El Niño is strengthening during the Caribbean Wet Season, while waters around the Caribbean continue to warm. This combination points to a complex risk environment for the region: increasingly intense humid heat, recurrent heatwaves, elevated heat stress, irregular rainfall, drought risk, and the continuing possibility of high-impact rainfall events.

This matters because El Niño is often oversimplified as meaning “less rain” or “fewer storms.” For business planning, that interpretation is too narrow. While El Niño is often associated with reduced tropical cyclone activity in the Atlantic basin, the regional outlook still points to a high risk of flooding, flash floods, and cascading impacts in parts of the Caribbean. At the same time, drought risk is expected to increase as the region moves toward the 2026–2027 Dry Season. As Jacqueline Spence-Hemmings, Climate Services Manager at the Meteorological Service of Jamaica, has cautioned, a below-normal hurricane season should not be read as permission for complacency: “we only need one.”

The implication is that firms cannot plan for El Niño as a single hazard. They must plan for a compound risk environment. A hotel may face higher cooling demand and water constraints at the same time. A supermarket may face higher refrigeration costs, higher food import prices, and spoilage risk. A manufacturer may face electricity cost pressure, water reliability issues, and delayed imported inputs. A farmer may face heat stress, irregular rainfall, higher irrigation demand, crop losses, and more expensive feed or fertilizer. A bank may see these risks appear indirectly through weaker borrower cash flow.

The climate signal therefore must be translated into a management signal. Heat outlooks, rainfall forecasts, drought advisories, flood potential outlooks, reservoir levels, Saharan dust forecasts, electricity demand notices, and shipping updates should not sit only with technical specialists. They should be incorporated into business continuity planning, procurement decisions, working-capital management, staff safety protocols, and board-level risk oversight.

## 2. The Economic Stakes: Climate Risk Meets Food, Fuel and Freight Volatility

El Niño is arriving in a Caribbean economy already exposed to overlapping shocks. The region’s climate vulnerability is well established: water resources, agriculture, health, infrastructure, coastal zones, tourism, and economic activity are all sensitive to climate variability and climate change. But the economic context is equally important. Caribbean firms are not absorbing climate risk in stable market conditions. They are absorbing it in an environment shaped by high import dependence, energy-price exposure, food-price pressure, logistics vulnerability, insurance constraints, and geopolitical uncertainty.

This is why the “compound climate cost” matters. El Niño may trigger or intensify one set of operating pressures, but those pressures are amplified by wider global risks. The war in Ukraine continues to affect grain, wheat, fertilizer, energy, and commodity-market dynamics. Tensions around critical energy and shipping corridors, including the Strait of Hormuz, add another layer of exposure for fuel-importing economies.

Climate-related disruption at maritime chokepoints has already shown how water stress can become a logistics and trade-cost problem. During the 2023–2024 Panama Canal drought, low rainfall reduced the freshwater available to operate the locks, forcing limits on daily vessel transits and reducing the flexibility that shippers normally rely on. At the height of the congestion, auction premiums to secure transit slots reportedly reached US\$4 million in addition to regular canal charges. The result was not only delay, but a repricing of access to one of the world's most important trade routes. Some vessels avoided or diverted away from the canal altogether during that period of drought-related constraint.

More recently, emerging tensions and uncertainty around the Strait of Hormuz have added further pressure on global routing decisions, vessel availability, freight rates, insurance costs, and delivery timelines. For import-dependent Caribbean economies, this illustrates a central supply-chain risk: climate stress in one chokepoint and geopolitical disruption in another can quickly become higher landed costs, longer lead times, stockout risk, and tighter working capital for firms far from the original disruption.

For the Caribbean, these risks converge through three core dependencies: food, fuel, and freight. The issue is not only whether goods can move, but at what cost, how reliably, and with how much cash tied up in inventory while firms wait for shipments to arrive.

Food dependence means that local agricultural stress can quickly combine with international price volatility. The Caribbean imports an estimated 60–80 percent of its food, while CARICOM's food import bill exceeds US\$6 billion annually. That is why the region's food-security agenda has focused on reducing the import bill by 25 percent, a target now extended to 2030 (Vision 25 x 2030). If heat, drought, irregular rainfall, or flooding reduce domestic and regional agricultural output, Caribbean consumers and businesses have less local buffer. When global grain, fertilizer, or food prices also become volatile, the impact is transmitted into restaurants, hotels, food retailers, school feeding programmes, household budgets, and wage pressure.

Fuel dependence means that heat-related electricity demand becomes more expensive in a region still heavily reliant on imported fossil fuels for power generation and transport. Higher cooling demand is therefore not only a comfort issue. It is an energy security and operating-cost issue. For firms with refrigeration, air conditioning, cold storage, manufacturing equipment, pumping systems, or backup generators, heat can raise electricity bills and fuel exposure at precisely the moment when global energy markets may be unstable.

Freight dependence means that Caribbean firms are vulnerable to disruption well beyond their national borders. Delays through major shipping routes, higher insurance costs, longer sailing distances, port charges, and limited inventory buffers can all raise landed costs. For

small island economies with high import dependence and limited warehousing capacity, even disruptions that occur thousands of miles away can appear locally as higher prices, delayed goods, stockouts, spoiled perishables, and working-capital pressure.

The economic stakes are therefore not confined to climate-sensitive sectors. El Niño is relevant to agriculture, tourism, manufacturing, retail, finance, logistics, utilities, construction, health services, education, and public administration. It is a cross-cutting risk because it moves through the systems that all firms rely on: energy, water, food, transport, labour, credit, and insurance.

Economic modelling reinforces this point. Liu et al. estimate that the damaging impact of El Niño can continue to increase for three years after the initial climate shock, as losses move through production, trade, infrastructure, agriculture, health, tourism, and productivity channels. Their modelling attributes global economic losses of approximately US\$2.1 trillion to the 1997–1998 extreme El Niño and US\$3.9 trillion to the 2015–2016 extreme El Niño. This underscores that El Niño's cost is not limited to the year of the event, nor to visible physical damage. Its effects can persist through slower growth, weaker output, higher costs, and delayed recovery.

The business lesson is clear. Caribbean firms should not treat El Niño as a forecast to be watched passively. It should be treated as an early warning that triggers financial, operational, and strategic preparation. In a compound-risk environment, resilience is not only about surviving the weather. It is about protecting margins, liquidity, supply continuity, staff wellbeing, and customer service when climate pressures meet food, fuel, and freight volatility.

### 3. The Cost Channels

The business impact of El Niño does not move through one channel. It moves through several at once. For Caribbean firms, the most important transmission channels are heat and energy, water stress, food and agricultural costs, freight and inventory exposure, labour productivity, and finance and insurance exposure. The compound climate cost becomes visible when these pressures converge, forcing firms to manage higher expenses, weaker reliability, and tighter cash flow at the same time.

#### 3.1 Heat, Energy Demand and Cooling Costs

Heat is one of the most immediate ways El Niño reaches the balance sheet.

Higher temperatures increase demand for air conditioning, ventilation, refrigeration, cold storage, pumping, and cooling of commercial spaces. This is particularly important in Caribbean economies where electricity prices are already shaped by heavy dependence on



imported fossil fuels. Heat therefore becomes both an operational issue and an energy-security issue.

Jamaica's experience during the 2023–2024 El Niño period provides a useful illustration of how heat can interact with other climate-related stressors. On July 12, 2023, JPS recorded Jamaica's highest electricity demand ever, at 692 MW. JPS linked the increase to customers using more fans and air conditioning to cope with the heat. That demand spike also coincided with a significant Saharan dust event affecting Jamaica, which likely reduced solar irradiance and constrained output from some residential, commercial, and utility-scale solar PV systems. The result was a broader system effect: higher cooling demand at the same time that some distributed solar customers may have been drawing more electricity from the grid than usual. For businesses, the lesson is clear: heat does not remain a weather event. It becomes a demand event, a grid event, a cost event, and a productivity event.

The impact is especially significant for hotels, supermarkets, restaurants, hospitals, office buildings, schools, manufacturers, data-dependent businesses, and firms managing refrigerated goods. Higher temperatures increase cooling loads, raise peak demand, stress backup systems, reduce equipment efficiency, and increase the risk of spoilage where refrigeration systems are underperforming.

The urban heat island effect intensifies this challenge. Commercial districts with paved surfaces, dense buildings, limited shade, and low vegetation can experience higher heat exposure than surrounding areas. For firms located in these zones, the cost of heat may appear in higher cooling demand, greater staff fatigue, lower customer comfort, reduced outdoor productivity, and increased occupational health risks.

Heat also affects human performance. Outdoor workers, warehouse staff, construction crews, transport workers, agricultural labourers, delivery teams, tourism workers, and maintenance personnel are particularly exposed. Heat stress can reduce physical productivity, increase fatigue, slow decision-making, raise safety risks, and increase absenteeism. Even where businesses do not experience direct physical damage, they may face reduced labour efficiency and higher health and safety obligations.

The labour-market implications are reflected in a 2026 International Labour Organisation (ILO) policy brief on El Niño and the world of work in Latin America and the Caribbean. The ILO warns that the 2026–2027 El Niño could threaten employment, reduce incomes and worsen working conditions, especially for informal, rural and outdoor workers. In the Caribbean, the ILO identifies agriculture, fisheries and tourism as among the sectors most exposed, with potential impacts including reduced rural incomes, forced labour migration, greater reliance on informal employment, severe heat stress among outdoor workers and

increased risk of child labour in vulnerable households. For firms, this reinforces the point that labour exposure is not only a human-resource issue; it is also a productivity, continuity, occupational safety and income-security issue.

### 3.2 Water Stress and Operating Continuity

Water is the second major cost channel.

El Niño conditions can affect rainfall distribution, reservoir recharge, soil moisture, irrigation demand, and the reliability of water supply. For businesses, this can translate into operating disruptions long before formal drought conditions are declared.

The cost of water stress is not limited to the price of water. It includes production delays, reduced service quality, additional storage costs, water trucking, equipment strain, sanitation risks, lower agricultural yields, and potential reputational damage. For some firms, the most expensive water is not the water they buy; it is the water that is unavailable when operations depend on it.

In tourism, water stress affects laundry, sanitation, pools, landscaping, kitchens, guest comfort, and destination image. In manufacturing and food processing, it affects cleaning systems, boilers, cooling processes, product quality, and compliance requirements. In agriculture, it increases irrigation demand, crop stress, livestock heat stress, feed costs, and vulnerability to pests and disease. In health, education, and care facilities, it affects hygiene, cooling, food preparation, and continuity of service.

At the same time, firms cannot prepare only for drought. CIMH/CariCOF's regional outlook makes clear that flood and flash-flood risk can remain elevated even in an El Niño year. Intense rainfall events can still damage roads, warehouses, drainage systems, farms, utilities, and business premises. This creates a dual planning requirement: firms must prepare for both insufficient water and too much water at once.

This duality is one of the defining features of climate risk in the Caribbean. A business may need drought operating procedures, water storage, leak management, and alternative water supply arrangements, while also maintaining drainage, flood protection, access routes, emergency communication systems, and business interruption coverage.

### 3.3 Food, Agriculture and Input Prices

Food is one of the most direct channels through which El Niño affects Caribbean households and businesses.

The risk is not only regional. WFP's early analysis of the 2026–2027 El Niño projects that at least 49 million more people could be pushed into acute food insecurity by the end of 2027,

with Latin America and the Caribbean among the regions expected to see one of the sharpest increases. For Caribbean firms, this matters because food insecurity and food-price pressure affect both sides of the market: the cost of inputs and the purchasing power of consumers.

Drought, heat, irregular rainfall, and flooding can reduce crop yields, damage produce, increase spoilage, disrupt planting and harvesting schedules, and raise the cost of irrigation, feed, and farm labour. These impacts move quickly through the value chain. They affect farmers, aggregators, food processors, supermarkets, restaurants, hotels, school feeding programmes, household budgets, and inflation.

The Caribbean's exposure is heightened by food import dependence. Where a large share of food consumption is imported, local agricultural losses are compounded by global market movements. Import-dependency trends are also increasing in key categories, with data from the Central Bank of Barbados showing that dependence on imports has increased in meats (23%), cereals (18%), and fruits and vegetables (15%). If domestic production falls while international food prices are rising, firms and households face pressure from both directions, especially where global grain, fertilizer, energy, and commodity markets are already being affected by geopolitical disruption.

For businesses, food inflation is not only a household welfare issue. It affects menu pricing, hotel food and beverage costs, supermarket margins, school and institutional catering, employee wage pressure, and consumer spending. As food and transport costs rise, households may reduce discretionary purchases, dine out less frequently, trade down to cheaper goods, or delay non-essential spending. Retailers and service businesses may then face both higher input costs and softer demand.

Agriculture also faces a working-capital challenge. Farmers may need to spend more on water, irrigation, feed, labour, crop protection, and replanting before they know whether yields will recover. Agribusinesses, lenders, insurers, and governments therefore need to treat El Niño as a credit, insurance, and food-system resilience issue, not only as a production risk.

### 3.4 Finance, Insurance and Working Capital

The final cost channel is finance.

El Niño can affect cash flow before it appears in profit and loss statements. Higher electricity bills, water costs, inventory costs, freight charges, insurance premiums, spoilage, repairs, and overtime can all increase operating expenditure. At the same time, revenue may soften if consumers reduce spending, tourists face service disruptions, farmers lose output, or manufacturers experience delays.

This makes El Niño a financial-management issue as much as an operational one. Higher utility, water, freight, inventory, labour, insurance, and repair costs can compress margins and weaken earnings before interest, taxes, depreciation and amortisation (EBITDA), while delayed shipments, softer sales, spoilage, and slower customer payments can tighten cash flow. Firms may also need to hold more inventory, pay suppliers earlier, finance emergency purchases, or seek short-term credit to maintain operations.

For lenders, this creates credit risk. Borrowers may face thinner margins, delayed payments, lower yields, higher operating costs, or increased debt-service pressure. Agriculture, tourism, retail, construction, logistics, and small manufacturing firms may be particularly exposed because their cash flows are sensitive to weather, demand, imports, and energy costs.

For insurers, El Niño raises questions about business interruption, flood exposure, crop loss, equipment failure, spoilage, and parametric insurance design. For firms, it raises the question of whether insurance coverage matches the actual risk channels. A company may not only need cover for physical damage. It may need to consider business interruption, supply-chain disruption, spoilage, flood exposure, and climate-related revenue loss.

For boards and senior managers, the practical question is whether El Niño has been translated into financial stress testing. Firms should ask what happens if electricity costs rise, water supply becomes unreliable, food inputs increase, freight is delayed, sales soften, or insurance costs rise at the same time. The compound risk is not one cost moving upward. It is several cost lines tightening at once.

## 4. Sector Exposure: Tourism, Agriculture, Manufacturing, Retail and Finance

El Niño affects firms differently depending on their sector, asset base, supply chains, labour intensity, and exposure to imported inputs. The risk is cross-cutting, but the business consequences are not uniform.

### 4.1 Tourism

Tourism is exposed through energy, water, food, labour, insurance, and destination experience. Its exposure matters at the macroeconomic level as well as the firm level. According to World Bank analysis citing the World Travel and Tourism Council, tourism contributed an average of 11.4% to Caribbean regional GDP in 2023 and supported more than 2.75 million jobs, accounting for 15.1% of total employment.

Hotels and resorts face higher cooling demand, greater pressure on water systems, higher laundry and sanitation costs, increased landscaping stress, and higher food and beverage

costs. Heatwaves can affect guest comfort, outdoor activities, staff productivity, and health and safety protocols. Water restrictions can affect operations directly, particularly where tourism facilities compete with household and municipal demand during periods of scarcity.

The sector also faces reputational risk. A destination affected by water shortages, heat stress, poor air quality, flooding, or service interruptions may experience reduced visitor satisfaction even if no major storm occurs. For tourism operators, El Niño planning should therefore include energy efficiency, water continuity, heat-health protocols, food procurement strategies, backup systems, insurance review, and guest communication.

## 4.2 Agriculture and Agribusiness

Agriculture is among the most directly exposed sectors.

Crop producers face rainfall variability, soil moisture stress, irrigation demand, heat stress, crop damage, pest pressure, and disrupted planting cycles. Livestock producers face heat stress, lower pasture quality, higher water demand, disease risks, and increased feed costs. Fisheries and aquaculture may also be affected by temperature changes, water quality, harmful algal conditions, and coastal disruptions.

Agribusinesses face the downstream effects: inconsistent supply, higher input costs, quality variation, spoilage, processing delays, and cash-flow stress among suppliers. The sector's resilience depends not only on farm-level adaptation but also on storage, aggregation, cold-chain reliability, crop insurance, climate-smart extension, water infrastructure, and financing that recognises seasonal and climate-related risk.

## 4.3 Manufacturing and Food Processing

Manufacturing is exposed through electricity, water, imported inputs, equipment reliability, and logistics.

Higher temperatures can increase cooling and ventilation requirements in factories and warehouses. Water stress can disrupt cleaning, processing, boilers, cooling systems, and compliance. Freight delays can affect raw materials, packaging, chemicals, machinery, spare parts, and export commitments. If production schedules are disrupted, firms may face overtime costs, penalties, lost sales, or weakened customer relationships.

Food processors are particularly exposed because they sit at the intersection of agriculture, water, energy, refrigeration, food safety, and logistics. Their resilience depends on reliable utilities, supplier diversification, inventory planning, preventive maintenance, cold-chain management, and contingency arrangements for water and power.



## 4.4 Retail and Distribution

Retailers experience El Niño through prices, inventory, refrigeration, consumer behaviour, and working capital.

Retail and distribution businesses may face higher landed costs, volatile product availability, spoilage risks for perishables, and increased refrigeration demand. For food retailers, this can affect fresh produce, dairy, meat, frozen goods, and imported staples. For general retailers, delayed shipments and higher freight costs may coincide with weaker consumer demand as households spend more on food, transport, electricity, and water. Pharmacies, hardware stores, wholesalers, and distributors may also experience sudden demand spikes for essential goods while facing slower replenishment cycles.

Retail resilience depends on stronger demand forecasting, diversified suppliers, inventory buffers for critical items, refrigeration maintenance, contract review, and cash-flow planning. Firms also need to understand which products are most exposed to climate-sensitive supply chains and which customers are most likely to reduce spending as household costs rise.

## 4.5 Finance and Insurance

Financial institutions are exposed indirectly through their clients.

Financial institutions are exposed less through direct weather impacts than through the balance sheets of their clients. Lower agricultural yields, higher utility costs, delayed inputs, softer retail demand, and weather-related construction delays can all weaken borrower cash flow and increase portfolio risk. For insurers, El Niño may shift exposure across drought, flood, business interruption, crop loss, spoilage, equipment failure, and supply-chain disruption. The opportunity is to move beyond traditional coverage models toward products and risk-transfer instruments that better reflect the compound nature of Caribbean climate risk.

For the financial sector, the strategic issue is not only whether climate risk is recognised, but whether it is priced, monitored, and managed before losses emerge. El Niño should be incorporated into portfolio stress testing, sector exposure reviews, agriculture lending, tourism credit assessments, SME working-capital facilities, and insurance product design.

## 5. Risk Matrix: Driver, Business Impact and Financial Consequence

El Niño-related risk becomes more useful for business planning when it is translated from climate language into financial and operational exposure. The matrix below provides a simple framework for identifying how climate drivers and external amplifiers can move through business operations.

| Risk Driver                                | Energy & Cooling | Water | Food & Inputs | Freight & Inventory | Labour Productivity | Finance & Insurance |
|--------------------------------------------|------------------|-------|---------------|---------------------|---------------------|---------------------|
| <i>Heatwaves and higher temperatures</i>   | ●                | ●     | ●             | ●                   | ●                   | ●                   |
| <i>Drought and reduced rainfall</i>        | ●                | ●     | ●             | ●                   | ●                   | ●                   |
| <i>Intense rainfall and flash flooding</i> | ●                | ●     | ●             | ●                   | ●                   | ●                   |
| <i>Agricultural stress</i>                 | ●                | ●     | ●             | ●                   | ●                   | ●                   |
| <i>Shipping and chokepoint disruption</i>  | ●                | ●     | ●             | ●                   | ●                   | ●                   |
| <i>Fuel and energy-market volatility</i>   | ●                | ●     | ●             | ●                   | ●                   | ●                   |

**Key :** ● Low exposure ● Medium exposure ● High exposure

**Interpretation:** The value of the map is not in any single cell, but in the clustering. El Niño-related risk becomes a business issue when multiple exposure areas shift into amber and red at the same time: energy, water, food, freight, labour, finance, and insurance. That clustering matters because the effects do not sit neatly in one line item. They can appear in the income statement as higher operating expenses, in EBITDA as margin compression, in the cash-flow statement as tighter liquidity, and on the balance sheet as higher inventory, receivables pressure, debt-service strain, or increased working-capital needs.

## 6. The Resilience Agenda

The resilience agenda for Caribbean firms should begin with a simple premise: El Niño is predictable enough to plan for, but variable enough to punish rigid assumptions. The objective, therefore, is to build systems that allow firms to act early when credible warning signs emerge.

### 6.1 Convert Climate Information into Management Triggers

Businesses should move from passive monitoring to trigger-based decision-making. CIMH/CariCOF outlooks, national meteorological service advisories, heat alerts, drought outlooks, flood potential outlooks, reservoir levels, Saharan dust forecasts, electricity utility notices, commodity prices and shipping updates should be connected to internal action thresholds.

A firm might decide, for example, that a drought alert triggers a water-use review, reservoir decline triggers additional storage planning, heat warnings trigger staff safety measures, shipping delays trigger reorder-point adjustments, and sustained commodity price increases trigger supplier renegotiation. The value of climate information lies not only in awareness, but in the decisions it activates.

### 6.2 Treat Heat as a Cost and Productivity Risk

Heat should be managed as both an energy cost and a labour-productivity issue. Businesses should service air-conditioning and refrigeration systems before peak heat periods, improve insulation, use shading where feasible, reduce unnecessary heat gain in buildings, maintain

ventilation, and review cooling strategies for critical rooms, warehouses and customer-facing spaces.

For workers, firms should develop heat-health protocols. These may include adjusted work hours, shaded rest breaks, hydration, job rotation, supervisor training, heat-stress awareness, and emergency procedures. The goal is to protect people while reducing delays, errors, fatigue, absenteeism and safety incidents.

### 6.3 Strengthen Water Resilience

Water resilience should be treated as a core business continuity issue, not only a utility concern. Firms should identify where water is essential to operations, including cleaning, sanitation, cooling, production, food preparation, landscaping, laundry, boilers, irrigation and staff welfare.

Practical measures include leak detection, water audits, storage, rainwater harvesting, reuse where appropriate, supplier agreements, drought operating procedures and maintenance of pumps, tanks and backup systems. For agriculture and agribusiness, water resilience also includes soil moisture management, mulching, drip irrigation, drought-tolerant crops, shade systems, livestock water planning and feed reserves.

### 6.4 Build Supply-Chain Flexibility

Firms should identify which inputs are climate-sensitive, import-dependent, single-sourced, perishable, or exposed to long shipping routes. The purpose is to know which disruptions would affect revenue, service quality or production most quickly.

Resilience options include supplier diversification, regional sourcing, revised reorder points, safety stock for critical inputs, stronger cold-chain management, review of contract clauses, and earlier procurement where cash flow allows. Firms should also consider whether inventory policy is aligned with the new risk environment. Holding too little inventory increases disruption risk, while holding too much can strain cash flow. The balance should be deliberate rather than accidental.

### 6.5 Protect Working Capital

El Niño-related costs often appear first as cash-flow pressure. Firms may need to pay more for electricity, water, fuel, freight, inventory, repairs, insurance and overtime before they can pass any cost increases to customers. In some sectors, demand may soften at the same time that costs rise.

Businesses should therefore conduct cash-flow stress tests. These should examine scenarios in which electricity costs rise, water becomes unreliable, freight is delayed, food

inputs become more expensive, sales weaken, insurance costs increase, or repairs are needed unexpectedly. The purpose is to identify financing gaps early and determine whether working-capital facilities, contingency reserves, revised payment terms, or supplier arrangements are needed.

## 6.6 Review Insurance and Risk Transfer

Insurance should be reviewed against the actual ways El Niño can affect operations. Physical damage from severe weather events is only one part of the risk. Firms should also consider business interruption, flood exposure, spoilage, crop loss, equipment failure, delayed shipments and revenue disruption.

Where available, parametric insurance and other climate-linked products may help address gaps, especially for agriculture, tourism, utilities and public-sector-linked services. However, insurance should not be treated as a substitute for resilience. It is one layer in a wider risk management strategy that includes prevention, preparedness, response and recovery.

## 6.7 Assign Ownership at Management and Board Level

El Niño risk cuts across departments. It is not only a facilities issue, a procurement issue, a finance issue or an environmental issue. It affects operations, human resources, health and safety, finance, supply chains, customer service, risk management and strategy.

For this reason, firms should assign responsibility clearly. Senior management and boards should know who monitors climate signals, who maintains the risk dashboard, who activates contingency plans, who communicates with staff and suppliers, and who assesses financial exposure. In a compound-risk environment, unclear ownership increases delays in implementation.

## 7. The Strategic Question for Caribbean Firms

The strategic question is whether Caribbean firms can convert early warning into early action.

El Niño exposes a larger business reality for the Caribbean. Climate risk no longer arrives only as a storm, flood, or drought. It also arrives as higher electricity demand, unreliable water supply, food-price pressure, freight volatility, reduced labour productivity, tighter insurance conditions, and working-capital stress. These impacts may be less dramatic than physical damage, but they can be just as consequential for margins, liquidity, EBITDA, cash flow, and business continuity.

This is the compound climate cost: the layering of climate signals, infrastructure constraints, import dependence, geopolitical volatility, and firm-level financial exposure. It is especially important for businesses operating in economies with high dependence on imported fuel, food, inputs, and goods. When climate stress meets global commodity volatility, fragile logistics, local infrastructure constraints, and limited financial buffers, the result is a more complex risk environment than traditional business continuity plans often assume.

There is also uncertainty. El Niño does not produce identical outcomes everywhere, and the Caribbean signal is not one-dimensional. Firms may need to prepare for drought conditions and water scarcity while still maintaining readiness for intense rainfall, flash flooding, and cascading impacts. The practical challenge is therefore not to predict every impact perfectly, but to build management systems that can respond early as conditions evolve. This is difficult for many firms because adaptation itself requires capital: energy efficiency upgrades, water storage, insurance coverage, cooling improvements, inventory buffers, and supply-chain diversification all carry upfront costs. Yet delaying those investments can leave firms more exposed to higher operating expenses, service disruption, lost sales, asset damage, and liquidity pressure.

For many firms, this will require investment at a time when capital is already constrained. Energy efficiency, water storage, inventory buffers, insurance coverage, cooling upgrades, supply-chain diversification, and staff safety protocols all carry costs. Yet delaying these investments can leave firms more exposed to higher operating expenses, service disruption, lost sales, asset damage, and liquidity pressure.

For Caribbean business leaders, the response should be disciplined preparation. Firms should know their exposure to heat, water, food, fuel, freight, labour, insurance, and credit. They should identify their most vulnerable cost lines, suppliers, sites, workers, and customers. They should use regional climate information as a management tool, stress-test cash flow, strengthen water and energy resilience, review supply chains, and assign accountability before disruption arrives.

The firms that respond best will not necessarily be those with the most resources. They will be those that understand their risk pathways early and act before those risks become losses.

The compound climate cost is already taking shape. El Niño is the signal, but the balance sheet is where many firms will feel it. Climate risk is no longer just an environmental issue. It is becoming an operating-cost, cash-flow, and working-capital issue for Caribbean business.

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