



# Physical Risk Brief FLOODS



**What Are Floods?** The Intergovernmental Panel on Climate Change (IPCC) defines a flood as “the overflowing of the normal confines of a stream or other body of water or the accumulation of water over areas that are not normally submerged”. The main types<sup>1</sup> of floods are:

**Flash Floods** – Heavy/excessive rainfall in a short period of time.

**Riverine Flood** – Overflow of water from a stream or river channel onto normally dry land.

**Coastal Flood / Storm Surge** – Intense storm that thrusts sea water onto the coast.

**Ice Jam Flood** – Floating ice that obstructs the flow of water.

**Groundwater Flood** – An abnormal increase in rainfall raises the water table.

**Dam Burst** – A failure of a dam.

**Debris Flows** – Water transports large amounts of solid matter.

Due to the variety of types, there are very few places in the world protected from flood events. The majority of floods can be predicted and prepared for, while others can occur quickly with little to no warning (e.g. flash floods).

**Did You Know...**

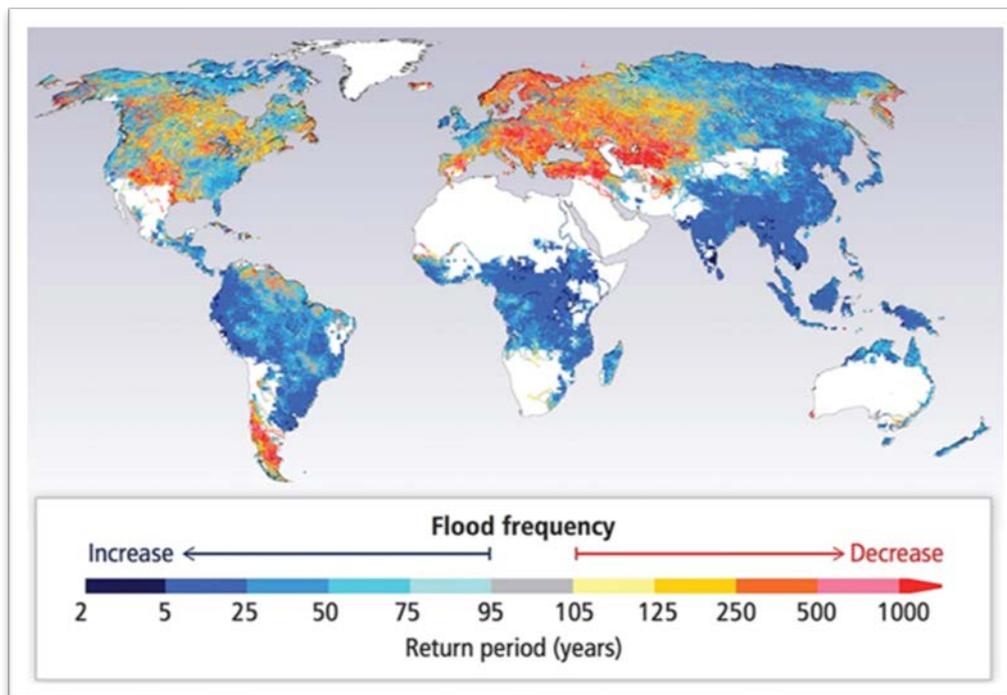
It is estimated that flooding affects approximately **250 million people** and cause **US \$40 billion dollars** in losses on an annual basis.

(Source: [OECD](#))

A mere **6 inches** of fast-moving flood water can knock over an adult. It takes **just 12 inches** of rushing water to carry away most cars and **just 2 feet** of rushing water can carry away SUVs and trucks.

(Source: [National Weather Service](#))

**What Global Regions Are Most Exposed to Floods?** The following map<sup>1</sup> provides a global perspective on flood exposure:



**Top 15 Global GDP Exposure to Inland Flooding<sup>2</sup>**

1. Bangladesh
2. Cambodia
3. Afghanistan
4. Vietnam
5. Laos
6. Rwanda
7. Tajikistan
8. Mali
9. Myanmar
10. Nepal
11. Gambia
12. Chad
13. Egypt
14. Liberia
15. Central African Republic

## What Are Some Leading Tools for Evaluating Flood Exposure?

[Global Flood Monitor](#) – detects flood events by automatically analyzing tweets in 11 languages. Both the historic and real-time events are shown.

[Climate Central, Inc.](#) – combines the global risk that will be seen from both sea level rise and increased flood risk.

[NOAA Sea Level Rise Viewer](#) – can map the increased risk of high tide flooding based on calculated sea level rises.

[World Resources Institute \(WRI\) Aqueduct Global Flood Analyzer](#) – aims to empower disaster risk analysts with quantitative information on flood risks and adaptation strategy costs, including the ability to assess costs and benefits of adapting to current and future flood risk.

[Dartmouth Flood Observatory](#) – global space-based measurement, mapping, and modeling of surface water for flooding monitoring and indexing.

[Global Risk Data Platform \(UNISDR\)](#) – various interactive web maps to view flood hazards and estimates of losses related to floods as well as the exposed population.

[DHI Flood and Drought Portal](#) – developed in 2018 by DHI in collaboration with UNEP, IWA, and UNEP-DHI to support decision-makers with technical tools and knowledge exchange.

[The Global Flood Awareness System \(GloFAS\)](#) – developed jointly by the European Commission and the European Centre for Medium-Range Weather Forecasts (ECMWF) the web platform visualizes forecast products based on real-time weather forecasts and historical observations.

**How Can Floods Impact the Beverage Industry?** Flooding can affect businesses in both urban and rural settings across the value chain. The following are common business considerations:

<p><b>Upstream / Sourcing</b></p> 	<ul style="list-style-type: none"> <li><input type="checkbox"/> Which first and second tier suppliers are located in flood plains? Are any of these suppliers sole source or business critical?</li> <li><input type="checkbox"/> Do key suppliers have business continuity plans that include flood events?</li> <li><input type="checkbox"/> How will the supply versus demand for goods and services change during a significant flooding event and how will that impact sourcing? Could there be material price volatility?</li> <li><input type="checkbox"/> Are sourcing disruptions incorporated into insurance (e.g. a stock throughput program (STP) for goods in transit and/or stock and inventory)?</li> </ul>
<p><b>Beverage Manufacturing</b></p> 	<ul style="list-style-type: none"> <li><input type="checkbox"/> Is your facility located in or near a flood zone?</li> <li><input type="checkbox"/> Does the facility have adequate flood insurance? What is and is not covered?</li> <li><input type="checkbox"/> Is the elevation of your facility's lowest floor at least 3 feet above the base flood elevation (BFE)?</li> <li><input type="checkbox"/> Can mechanical, electrical, HVAC, and IT equipment be better protected by moving or elevating to a higher level or floor?</li> <li><input type="checkbox"/> Does the facility's business continuity plan include flood events?</li> <li><input type="checkbox"/> How sensitive are key utility sources (e.g. electricity, water quantity and quality, wastewater)?</li> <li><input type="checkbox"/> Is documentation necessary for federal, state, or local assistance during a disaster prepared and protected?</li> <li><input type="checkbox"/> How would employees be communicated with before, during, and after a major flood event?</li> </ul>
<p><b>Downstream / Market</b></p> 	<ul style="list-style-type: none"> <li><input type="checkbox"/> Does the local community have adequate disaster and resiliency plans that consider floods?</li> <li><input type="checkbox"/> What are community expectations for businesses during major flood events?</li> <li><input type="checkbox"/> How does the facility communicate to customers during flood events and what are main needs that the facility could support?</li> </ul>

**What Are the Potential Financial Impacts from Flooding?** The following provides guidance on considering the potential financial impacts associated with flooding. It is important to point out that while negative impacts are summarized in this section, proper assessment and mitigation of flood-related risks can create positive impacts, cost avoidance, and competitive advantages.

Financial Category	Description	Potential Business Impacts
Revenue and Sales	Income from normal business activities, usually from the sale of goods and services	<ul style="list-style-type: none"> <li>Loss of revenue from operational disruption (facility downtime, raw material supply, and/or distribution)</li> </ul>
Expenditures: OpEx	Ongoing operating expenditures to run a facility	<ul style="list-style-type: none"> <li>Higher expenses for flood protection, insurance premiums, and/or recovery expenses</li> </ul>
Procurement Costs	Volatility in cost and/or availability of raw materials	<ul style="list-style-type: none"> <li>Increased costs due to need for sourcing from alternative producers, delays in receiving materials, and/or supply versus demand price volatility</li> </ul>
Assets: CapEx	Capital expenditures where the benefit continues over a long period; non-recurring nature; results in acquisition of permanent assets	<ul style="list-style-type: none"> <li>Higher capital expenditures for flood mitigation and asset protection</li> </ul>
Assets: Tangible	Changes in the value of tangible assets (land, equipment, facilities, reserves, cash, etc.)	<ul style="list-style-type: none"> <li>Increased cost due to physical damage or impairment of assets due to flooding</li> </ul>
Assets: Intangible	Changes in the value of intangible assets (brand, copyrights, goodwill)	<ul style="list-style-type: none"> <li>Not material for flood-related risks</li> </ul>
Liabilities and Financing	Changes in current liabilities, long-term debt liabilities, and equity capital	<ul style="list-style-type: none"> <li>Restricted access to capital and debt markets</li> <li>Increased exposure to divestment risk</li> </ul>

**What is BIER?** The Beverage Industry Environmental Roundtable (BIER) is a technical coalition of leading global beverage companies working together to advance environmental sustainability within the beverage sector and beyond. Formed in 2006, BIER aims to accelerate sector change and create meaningful impact on environmental sustainability matters. Through development and sharing of industry-specific analytical methods, best practice sharing, and direct stakeholder engagement, BIER accelerates the process of analysis to sustainable solution development. For more information, please visit: [www.bierroundtable.com](http://www.bierroundtable.com).

BIER is facilitated by Antea Group (<https://us.anteagroup.com>)



#### References

- <https://www.publichealthpost.org/databyte/global-flood-risk-under-climate-change/>
- <https://www.wri.org/blog/2015/03/world-s-15-countries-most-people-exposed-river-floods>