RAINFALL IDF CURVES

DESIGNING FOR A RESILIENT FUTURE

ENGINEERING & DISASTER MANAGEMENT BUILT ON DATA YOU CAN TRUST

The Caribbean is facing growing challenges as extreme rainfall events are projected to become more frequent and intense due to climate change. Rainfall Intensity-Duration-Frequency (IDF) curves give engineers and disaster managers critical data to design resilient infrastructure, prepare for extreme weather events, reduce recovery costs, and protect communities by enhancing public safety.

WHAT ARE IDF CURVES?

IDF curves describe the relationship between rainfall intensity (how heavy the rain is), duration under consideration (how long it lasts), and frequency (the likelihood of the rainfall event occurring). They are essential for:

- Estimating design rainfall
- Designing appropriate drainage solutions
- Establishing flood alert thresholds for early warning
- Supporting flood risk assessments

WHY THEY MATTER FOR PRACTICE

Infrastructure is only as resilient as the data used to design it. Outdated or proxy IDF curves can lead to under or over-designed systems, wasted resources, and increased flood risk. Accurate, climate informed IDF curves help:

- Enhance the design of culverts, channels, and drainage systems
- Establish thresholds for flood warnings and emergency planning
- Support hazard mapping and risk assessment

THE PROJECT

The Caribbean Institute for Meteorology and Hydrology (CIMH) has been engaged by the Caribbean Development Bank (CDB), to produce new IDF curves for all CDB Borrowing Member Countries (BMCs). This work integrates:

- Satellite-based rainfall data for broad spatial coverage
- Ground-based rainfall records for historical accuracy
- Climate projections to account for future changes

The result, robust, country-specific datasets that reflect both present and projected rainfall extremes.

USING IDF CURVES IN ENGINEERING & DISASTER MANAGEMENT

- **Drainage and Stormwater Design:** Ensure systems can handle current and future peak flows
- **Infrastructure Standards:** Incorporate updated IDF curves into technical design manuals to guide resilient construction
- **Flood Forecasting:** Enhance the accuracy of flood forecasting tools
- **Risk Mapping & Evacuation Planning:** Assess high-risk areas and develop safe, efficient evacuation routes

BUILDING INFRASTRUCTURE THAT LASTS

Using up-to-date IDF curves ensures designs are fit for purpose now and in the decades ahead. This protects investments, reduces maintenance costs, and safeguards communities from avoidable flood impacts.

Key Benefits

- Reduce costly retrofits and repairs
- Align designs with projected climate conditions
- Improve reliability of disaster risk models
- Enhance collaboration between engineers, planners, and emergency services

SCAN ME