

Impact-Based Forecasting

A brief introduction (or recap)

Impact-Based Forecasting

“Impact-based forecasting is a structured approach for combining **hazard, exposure, and vulnerability data** to **identify risk** and **support decision-making**, with the ultimate objective of encouraging **early action** that **reduces damages and loss of life from natural hazards**.”

“Impact-based forecasting **enables anticipatory actions and revolutionizes responses to weather and climate crises**, providing national and local authorities the opportunity to anticipate and coordinate pre-emptive measures to mitigate the impacts resulting from climate-related events and hazards.”

UNESCAP Manual for Operationalizing Impact-based Forecasting and Warning Services (IBFWS)
https://www.unescap.org/sites/default/d8files/knowledge-products/IBFWS%20Manual_FINAL.pdf

Traditional Forecasts

There is the potential for 150mm of rain in an hour



Some places will experience 60mph winds today



Temperatures today will reach 35°C



A volcanic ash advisory has been issued



Impact Forecasts

Heavy rain may cause flooding...

There is the potential for an hour of rain in an hour



Some places will experience 60mph winds today



With strong coastal winds there is a risk for port operations and a capsizing risk...

High temperatures may cause issues for those with underlying health conditions...

Temperatures today will reach 35°C



A volcanic ash advisory has been issued



There may be delays to flights due to the recent eruption of...

Impact-Based Forecasts and Warnings

What the
weather *will be*

What the
weather *will do*



Will 50mph winds across a major city cause different impacts than a sparsely populated rural area?



What impacts will 20mm of rain have after a long dry spell compared to a succession of recent storms?



Will heavy snowfall in a mountainous area cause relatively minor impacts in comparison to a lesser amount at low lying elevations which don't usually see snow?



Will the first event of a season be more or less impactful than the same event later in that "season" e.g. first tropical cyclone of the season or first snowfall of a season – or does it depend on the hazard?

Key Terminology



HAZARD

A potentially damaging physical event, phenomenon or human activity, that may cause injury or loss of life, property damage, social and economic disruption, or environmental degradation.

EXPOSURE

People, property, systems, or other elements present in hazard zones that are thereby subject to potential losses.

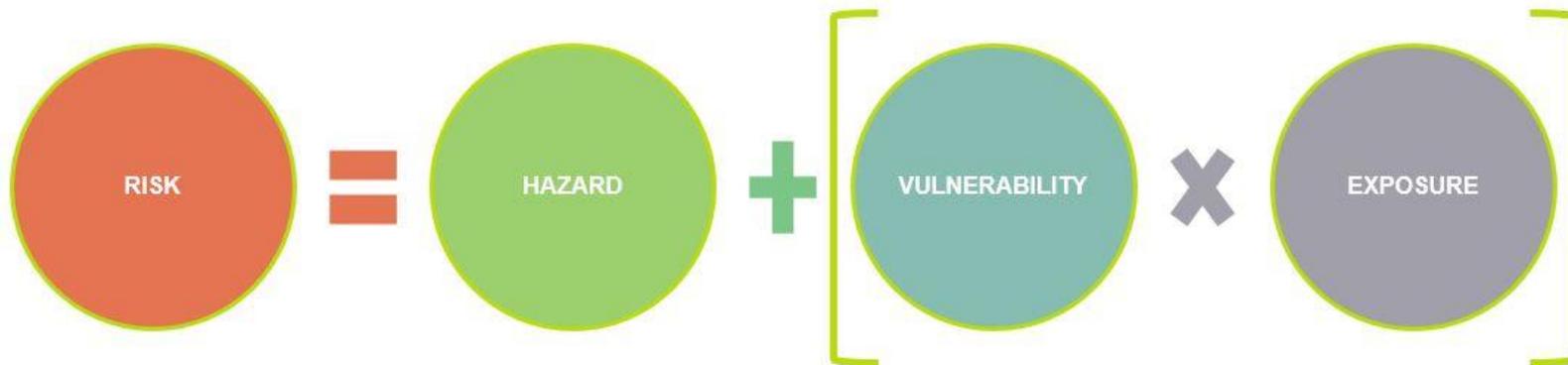
VULNERABILITY

The characteristics and circumstances of a community, system or asset, that make it susceptible to the damaging effects of a hazard.

RISK

The combination of the probability of an event and its negative consequences.

Impact Based Forecasting



Dynamic Vulnerability....



TIME OF THE DAY



TIME OF THE YEAR



DURATION OF THE
EVENT



FREQUENCY OF THE
HAZARD/NO. OF THE
HAZARD



OTHER EVENTS



PRECEDING
CONDITIONS

Impact Based Forecasting Communicating Risk

Likelihood →	High		✓	
	Medium			
	Low			
Impact →		Low/Minor	Medium/ Significant	High/Severe

		IMPACT			
		VERY LOW	LOW	MEDIUM	HIGH
LIKELIHOOD	HIGH				
	MEDIUM				
	LOW				✓
	VERY LOW				

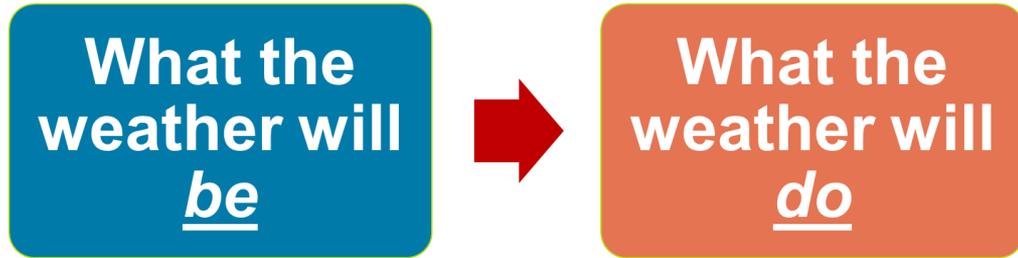
High		2	6	10	
Medium		1	5	9	
Low			4	8	
Very Low			3	7	
		Minimal	Minor	Significant	Severe

Typical Categorisation of Impacts

Impact Levels for All Weather Types			
Very Low	Low	Medium	High
On the whole, day to day activities not affected but	Some short lived disruption to day to day	Injuries with danger to life	Danger to life
<p style="text-align: center;">'NORMAL WEATHER'</p>	<p style="text-align: center;">'BUSY DAY'</p>	<p style="text-align: center;">SHORT TERM STRAIN ON EMERGENCY SERVICES</p>	<p style="text-align: center;">PROLONGED STRAIN ON EMERGENCY SERVICES</p>
affected.	under 'business as usual' response by	Transport routes and	

Minimal	Minor	Significant	Severe
Day to day activities not affected but some small scale impacts occur	Some local incidents, minor disruptions, 'business as usual' for emergency responders	Disruption to day to day routines and activities, mostly localised . Short-term strain on emergency responder organisations	Widespread , Prolonged disruption to day to day routines and activities Prolonged strain on emergency responders organisations.

Summary



- It combines the **level of impact**, with the **likelihood of the impact** occurring. These rely on an understanding of exposure and vulnerability within the region, which may not remain static.
- Stakeholders are crucial;
 - ...**informing** the development of the service,
 - ...contributing to **impact** information and assessment
 - ...providing **feedback**
- No warning doesn't mean no impact.

Any questions?