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Protecting and improving the nation's health



International
Science Council



UNITED NATIONS
UNIVERSITY



World Health
Organization

UNECE Expert Forum for producers and users of climate change-related statistics
3-4 October 2019 Palais des Nations, conference room XI, Geneva, Switzerland

Session 2: Measuring climate change adaptation and hazardous events and disasters

UNDRR/ISC *Review of the hazard terminology and classification*

Professor Virginia Murray, Public Health England

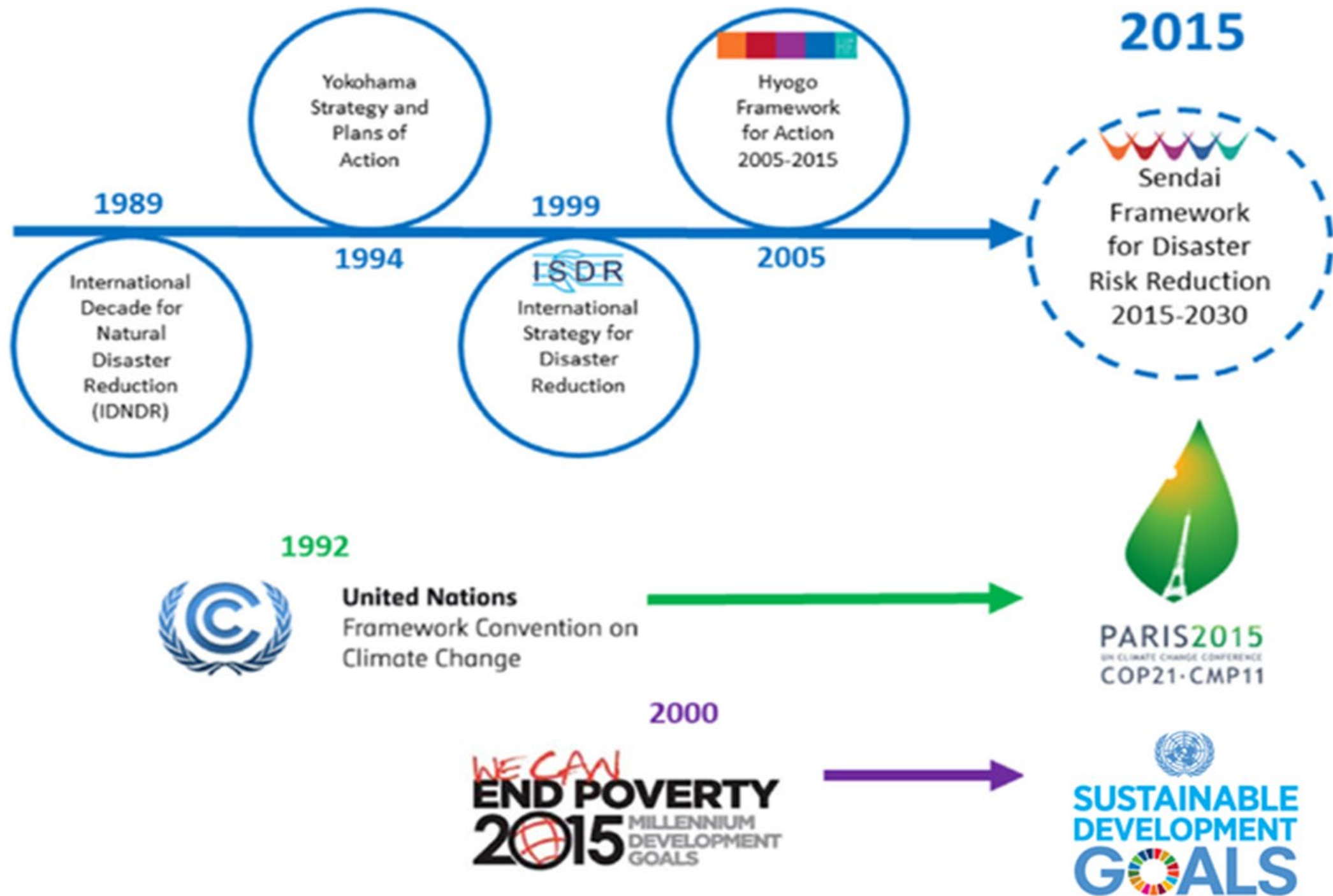
Head of Global Disaster Risk Reduction

Chair of UNDRR/ISC technical working group for Hazard Terminology and Classification Review

Member of Integrated Research on Disaster Risk (IRDR) Scientific Committee

Member of the UN Sustainable Development Solutions TReNDS Network

Co-Chair WHO Thematic Platform Health Emergency and Disaster Risk Management Research Network



Sendai Framework for Disaster Risk Reduction 2015 - 2030



A	Number of deaths and missing persons attributed by disaster, per 100,000 people
B	Number of persons affected by disaster, per 100,000 people
C	Direct disaster economic loss in relation to global GDP; including agriculture, productive assets, housing sectors, critical infrastructure and cultural heritage)
D	Disaster damage to critical infrastructure and disruption of basic services; among them health and educational facilities
E	Number of countries and local governments that adopt and implement national and local disaster risk reduction strategies
F	International cooperation to developing countries through adequate and sustainable support to complement their national actions for implementation of the present Framework
G	Number of countries that have multi-hazard early warning systems, access to disaster risk information





Sendai Framework for Disaster Risk Reduction 2015-2030

The substantial reduction of disaster risk and losses in lives, livelihoods and health and in the economic, physical, social, cultural and environmental assets of persons, businesses, communities and countries



Sendai Framework for Disaster Risk Reduction 2015-2030

1 Global Outcome

13 Guiding Principles

4 Priorities for Action at all levels

7 Global Targets

7 GLOBAL TARGETS

Reduce

Mortality/
global population

2020-2030 Average << 2005-2015 Average

Affected people/
global population

2020-2030 Average << 2005-2015 Average

Economic loss/
global GDP

2030 Ratio << 2015 Ratio

**Damage to critical infrastructure
& disruption of basic services**

2030 Values << 2015 Values

Increase

Countries with national
& local DRR strategies
2020 Value >> 2015 Value

**International
cooperation**
to developing countries
2030 Value >> 2015 Value

**Availability and access
to multi-hazard early warning
systems & disaster risk
information and assessments**
2030 Values >> 2015 Values

Words into Action Guidelines

National Disaster Risk Assessment

Governance System, Methodologies,
and Use of Results

2017



SENDAI FRAMEWORK
FOR DISASTER RISK REDUCTION

LOGIN

MEASURING IMPLEMENTATION OF THE SENDAI FRAMEWORK

ANNOUNCEMENT

The Sendai Framework Monitor system is now live!

After the adoption of Sendai Framework in 2015, 38 indicators were defined to measure progress in achieving its 7 Global targets. This system is the official tool to report these indicators to both the Sendai Framework and SDG's reporting processes.



Sendai Framework for Disaster Risk Reduction 2015-2030

- To strengthen technical and scientific capacity to capitalize on and consolidate existing knowledge and to develop and apply methodologies and models to assess disaster risks, vulnerabilities and exposure to **all hazards**; *(paragraph 24 j)*



Hazard

A process, phenomenon or human activity that may cause loss of life, injury or other health impacts, property damage, social and economic disruption or environmental degradation.

Annotations: Hazards may be naturally occurring or induced. Natural hazards are predominantly associated with natural processes, while induced hazards, are induced entirely or partly by human activities. Hazards may include the occurrence or risk of a hazard event, or be subject to international humanitarian law. Hazards they are associated with a combination of factors, such as degradation and climate change.

Hazards may be single, sequential or recurrent. Hazards may be location, intensity or magnitude, frequency, duration, infectiousness or toxicity, or other characteristics. Hazards may be case fatality rate and estimation of risk.

Multi-hazard means (1) the selection of hazards in contexts where hazardous events may occur, taking into account the potential for cascading effects.

Hazards include (as mentioned in alphabetical order) biological, environmental, geological, technological and phenomena.

Biological hazards are of organic origin, including microorganisms, toxins and bioactive substances, venomous wildlife and insects, poisons, etc.

Environmental hazards may include chemical, natural and biological hazards. They can be created by environmental degradation or physical or chemical pollution in the air, water and soil. However, many of the processes and phenomena that fall into this category may be termed drivers of hazard and risk rather than hazards in themselves, such as soil degradation, deforestation, loss of biodiversity, salinization and sea-level rise.

Geological or geophysical hazards originate from internal earth processes. Examples are earthquakes, volcanic activity and emissions, and related geophysical processes such as mass movements, landslides, rockslides, surface collapses and debris or mud flows. Hydrometeorological factors are important contributors to some of these processes. Tsunamis are difficult to categorize: although they are triggered by undersea earthquakes and other geological events, they essentially become an oceanic process that is manifested as a coastal water-related hazard.

Hydrometeorological hazards are of atmospheric, hydrological or oceanographic origin. Examples are tropical cyclones (also known as typhoons and hurricanes); floods, including flash floods; drought; heatwaves and cold spells; and coastal storm surges. Hydrometeorological conditions may also be a factor in other hazards such as landslides, wildland fires, locust plagues, epidemics and in the transport and dispersal of toxic substances and volcanic eruption material.

Technological hazards originate from technological or industrial conditions, dangerous procedures, infrastructure failures or specific human activities. Examples include industrial pollution, nuclear radiation, toxic wastes, dam failures, transport accidents, factory explosions, fires and chemical spills. Technological hazards also may arise directly as a result of the impacts of a natural hazard event.

Integrated Research on Disaster Risk (IRDR)

http://www.irdrinternational.org/wp-content/uploads/2014/04/IRDR_DATA-Project-Report-No.-1.pdf

Peril Classification and Hazard Glossary


DATA Project Report No. 1



IRDR Perils Classification and Hazard Glossary 2014

- **Geophysical:** a hazard originating from solid earth. This term is used interchangeably with the term geological hazard.
- **Hydrological:** a hazard caused by the occurrence, movement, and distribution of surface and subsurface freshwater and saltwater.
- **Meteorological:** a hazard caused by short-lived, micro- to meso-scale extreme weather and atmospheric conditions that last from minutes to days.
- **Climatological:** a hazard caused by long-lived, meso- to macro-scale atmospheric processes ranging from intra-seasonal to multi-decadal climate variability.
- **Biological:** a hazard caused by the exposure to living organisms and/or their toxic substances (e.g. venom, mold) or vector-borne diseases that they may carry. Examples are venomous wildlife and insects, poisonous plants, algae blooms, and mosquitoes carrying disease-causing agents such as parasites, bacteria, or viruses (e.g., malaria).
- **Extraterrestrial:** a hazard caused by asteroids, meteoroids, and comets as they pass near earth, enter the Earth's atmosphere, and/or strike the Earth, or changes in inter planetary conditions that effect the Earth's magnetosphere, ionosphere, and thermosphere.





Natural hazards



Technological hazards



Disease



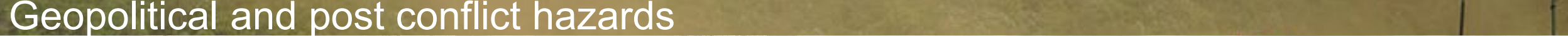
Environmental hazards




Climatic hazards



Humanitarian hazards



Geopolitical and post conflict hazards



Violence and terrorism hazards



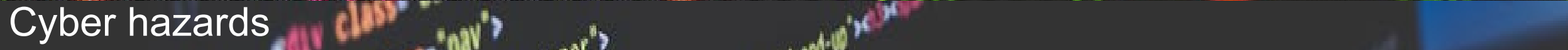
Externality, space weather and meteors



Trade Dispute hazards



Financial Shock hazards



Cyber hazards



Transport hazards



And what other hazards should be identified?

GENERIC GROUPS ¹	1. NATURAL						2. HUMAN-INDUCED ^{2,3}		3. ENVIRONMENTAL
GROUPS	1.2 HYDRO-METEOROLOGICAL						2.1 TECHNOLOGICAL	2.2 SOCIETAL	3.1 ENVIRONMENTAL DEGRADATION ¹⁷
SUBGROUPS	1.1 GEOPHYSICAL ⁴	1.2.1 HYDROLOGICAL ⁴	1.2.2 MTEOROLOGICAL ⁴	1.2.3 CLIMATOLOGICAL ⁴	1.3 BIOLOGICAL ⁵	1.4 EXTRATERRESTRIAL ⁴	Industrial hazards: ⁸ - chemical spill - gas leak - radiation [radiological, nuclear] Structural collapse: - building collapse ^{8,9} - dam/bridge failures Occupational hazards - mining Transportation: ^{8,11} - air, road, rail, water, space Explosions Fire ⁸ Air pollution: ⁹ - haze ¹⁰ Infrastructure disruption: - power outage ¹¹ - water supply - solid waste, waste water - telecommunication Cybersecurity Hazardous materials in air, soil, water: ^{12,13} - biological, chemical, radiological Food contamination ⁷	Acts of violence Armed conflicts: ¹⁴ - international - non-international Civil unrest Stampede Terrorism: - chemical, biological, radiological, nuclear, and explosives ^{15,16} Financial crises: - hyper-inflation - currency crisis	Erosion Deforestation Salinization Sea level rise Desertification Wetland loss / degradation Glacier retreat / melting Sand encroachment
MAIN TYPES	Earthquake: - ground-shaking	Flood: - riverine flood - flash flood - coastal flood - ice jam flood	Storm: - extratropical storm - tropical cyclone [cyclonic wind, cyclonic rain, cyclone (storm) surge] - convective storm [tornado, wind, rain, winter storm, blizzard, derecho, lightning, thunderstorm, hail, sand/dust storm]	Drought Wild fire: - land fire [e.g. brush, bush, pasture] - forest fire Glacial lake outburst (flood)	Airborne diseases Waterborne diseases Vector-borne diseases Foodborne outbreaks ⁷ Insect infestation: ⁴ - grasshopper - locust Animal diseases Plant diseases Aeroallergens Antimicrobial resistant micro-organisms Animal-human contact - venomous animals [snakes, spiders]	Impact: - airburst - meteorite Space weather: - energetic particles - geomagnetic storms - shockwave			
-SUBTYPES	Tsunami								
[SUB-SUBTYPES]	Mass movement (geophysical trigger): - landslide - rock fall - subsidence Liquefaction Volcanic activity: - ash fall - lahar - pyroclastic flow - lava flow	Mass movement (hydro-meteorological trigger): - landslide - avalanche (snow) - mudflow - debris flow Wave action: - rogue wave - seiche							



Sendai Framework for Disaster Risk Reduction 2015-2030

- The present Framework will apply to the risk of **small-scale and large-scale, frequent and infrequent, sudden and slow-onset disasters** caused by natural or man-made hazards, as well as related environmental, technological and biological hazards and risks. It aims to guide the multihazard management of disaster risk in development at all levels as well as within and across all sectors.

(Paragraph 15)



Intensive disaster risk

The risk of high-severity, mid-to low-frequency disasters, mainly associated with major hazards.

Annotation: Intensive disaster risk is mainly a characteristic of large cities or densely populated areas that are not only exposed to intense hazards such as strong earthquakes, active volcanoes, heavy floods, tsunamis or major storms but also have high levels of vulnerability to these hazards.

Extensive disaster risk

The risk of low-severity, high-frequency hazardous events and disasters, mainly but not exclusively associated with highly localized hazards.

Annotation: Extensive disaster risk is usually high where communities are exposed to, and vulnerable to, recurring localized floods, landslides, storms or drought. Extensive disaster risk is often exacerbated by poverty, urbanization and environmental degradation.

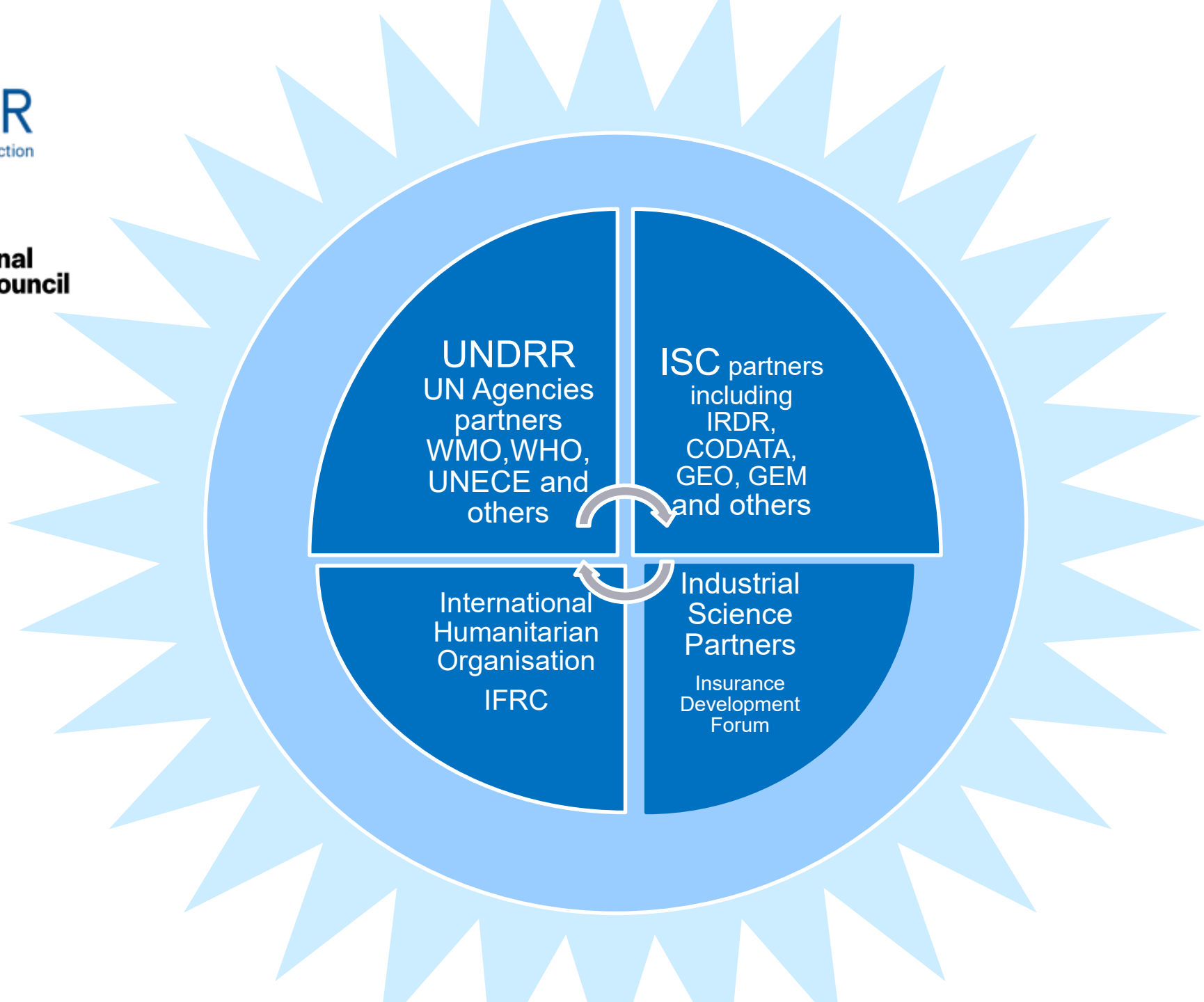
Report of the open-ended intergovernmental expert working group on indicators and terminology relating to disaster risk reduction; UN General Assembly February 2017



UNDRR/ISC Technical Working Group on the Hazard Terminology Review and Classification

- Launched at the Science and Policy Forum of Global Platform, Geneva, May 2019
- Task Team consisting of scientists and technical experts from relevant UN agencies (including WMO and WHO), scientific community representatives, and input from the insurance industry and international humanitarian organisations





UNDRR/ISC Technical Working Group on the Hazard Terminology Review and Classification

- Aim is to work towards developing a comprehensive hazard list underpinned by scientific and technical assessment
- Activities include review of glossaries from the scientific and technical domains, building expert consensus and wider consultation
- Draft list under development



Tests whether to include a hazard

- Does it fulfill the definition of a hazard as per the UN General Assembly adopted Open Ended Intergovernmental Working Group?
- Is there internationally agreed UN agency definition? if no – is there a generally accepted scientific definition from an authoritative source?.
- (Is the hazard measurable? Are there internationally agreed standards?)
- *What else should be used as inclusion/exclusion criteria?*



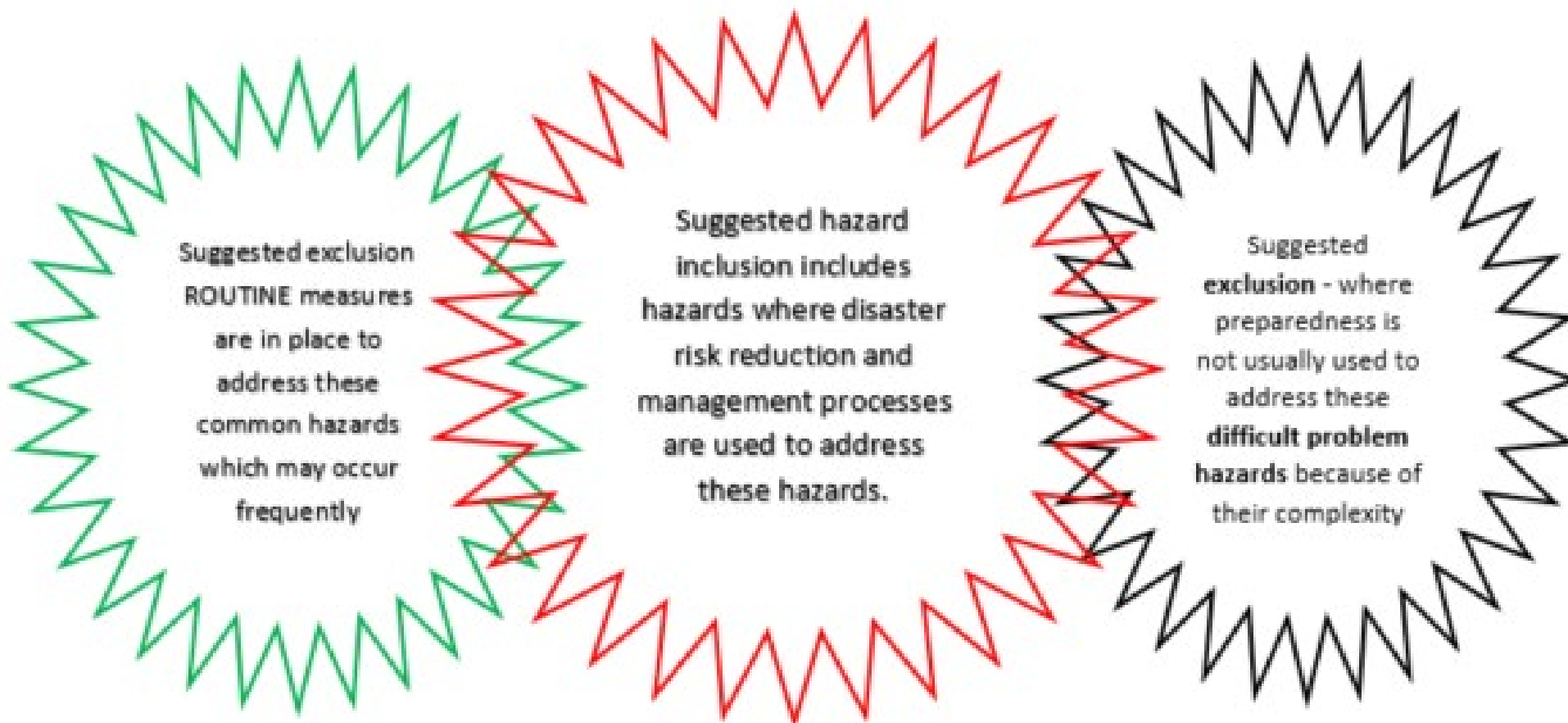
Hazard

A process, phenomenon or human activity that may cause loss of life, injury or other health impacts, property damage, social and economic disruption or environmental degradation.

- Does it fulfill the definition of a hazard as per the UN General Assembly adopted Open Ended Intergovernmental Working Group?
- Is there internationally agreed UN agency definition? if no – is there a generally accepted scientific definition from an authoritative source?.
- (Is the hazard measurable? Are there internationally agreed standards?)
- *What else should be used as inclusion/exclusion criteria?*



In development - setting the parameters for the hazard terminology review



Number	HAZARD
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Primary definition

Brief Definition of hazard: this should be no more than 3 lines/2 sentences.
This should be sourced from the highest possible authority and be applicable to all parties and is preferably a simple UN definition but also recognised as the highest level that UN member states can use and apply.

REFERENCE/ hyperlink/Web site

Scientific definition

Expanded scientific definition that is preferably measurable, modellable and statistically relevant

REFERENCE/ hyperlink/Web site

Metrics, numerical limits or defined guidelines

Any globally agreed metrics, numerical limits or guidelines defined
Should be globally agreed as a recognised standard, if it is only at a regional level than state this as a reference.

REFERENCE/ hyperlink/Web site

Any essential annotations

Such as ‘drivers’ to cause the hazard and any secondary hazards which may be caused by this hazard (if applicable)

REFERENCE/ hyperlink/Web site

Ownership of Definition(s)

UN or Scientific Agency or Organisation who holds the updating responsibility for the Primary Definition

Name of Contributor/s to hazard definition and dates, updating using version control

CONFERENCE OF EUROPEAN STATISTICIANS

For decision

Meeting of the 2019/2020 Bureau
Geneva (Switzerland), 16-17 October 2019

Item 4 (d) of the Provisional
Agenda

**MEASURING HAZARDOUS EVENTS AND DISASTERS –
PROPOSAL FOR FURTHER WORK**

Prepared by the Task Force and the Secretariat

RECOMMENDATIONS FOR FURTHER WORK

- A. Implementation guidelines**
- B. Statistical operationalization of terms, definitions and classifications used in disaster risk management**
 - **develop a single internationally agreed hazard classification, following the principles of a statistical classification;**
- C. Set of core statistics and indicators**
- D. Establishing a community of practice, exchange of experience and knowledge**



UNDRR/International Science Council Hazards Terminology project

- **Hazard terminology** is essential to assist UN member states to enhance completeness of reporting for the Sendai Framework Monitor and implementing the Sendai Global Targets
- The Sendai Framework provides an agreed method to enhance capabilities **to plan and prepare for, respond to, and recover from emergencies and disasters in partnership**
- Offers an opportunity to engage at a global level with stakeholders on guidance and policy issues that could impact national to local community preparedness

