



A Science Plan for Integrated Research on Disaster Risk

Addressing the challenge of natural and human-induced environmental hazards and disasters

Report of ICSU Planning Group on Natural and Human-induced Environmental Hazards and Disasters

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Distribution of natural disasters: by origin (1900-2003, by decades*)

	1900-1909	1910-1919	1920-1929	1930-1939	1940-1949	1950-1959	1960-1969	1970-1979	1980-1989	1990-1999	2000-2003	Total
Hydro-meteorological	28	75	56	74	128	280	511	795	1575	2139	1444	7105
Geological	36	26	32	38	53	58	94	128	234	283	152	1134
Biological	5	12	10	3	3	3	40	65	167	351	297	956
Total	69	113	98	115	184	341	645	988	1976	2773	1893	9195

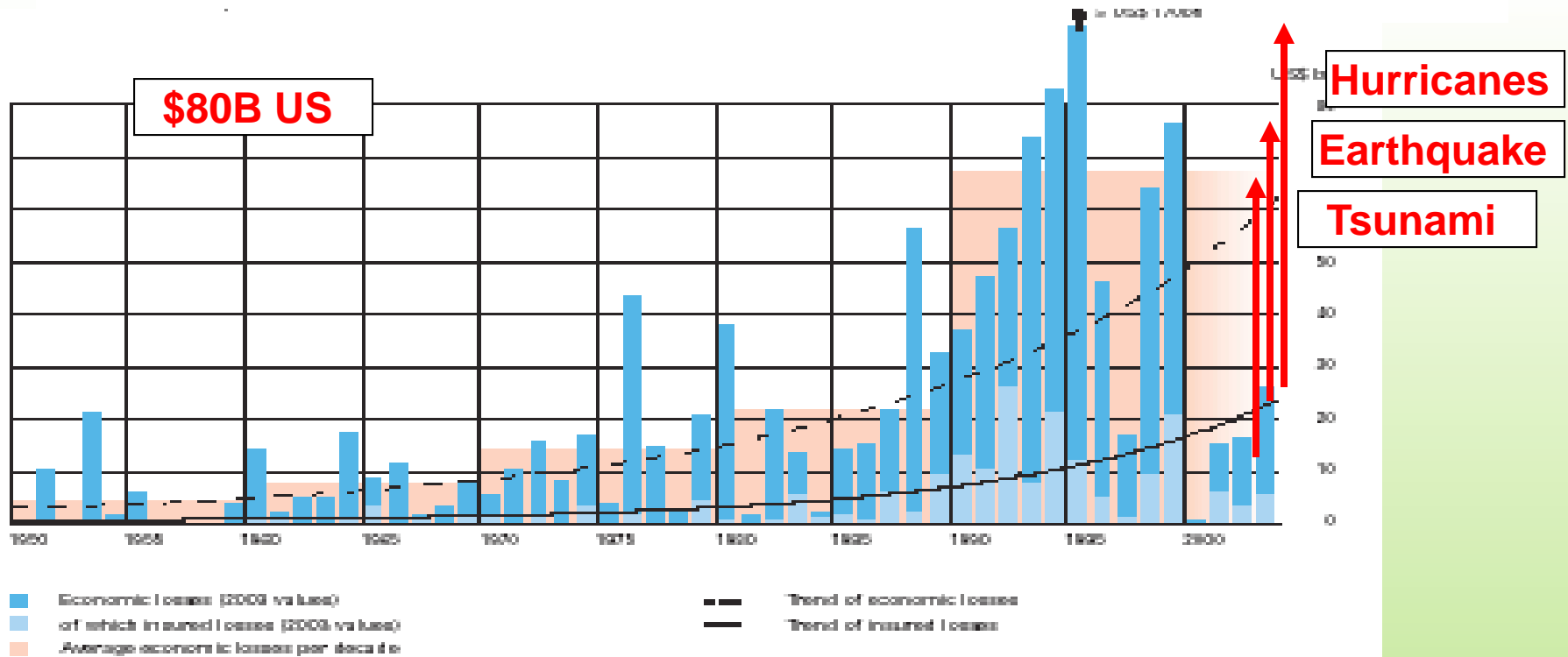
65

99

200

280

470

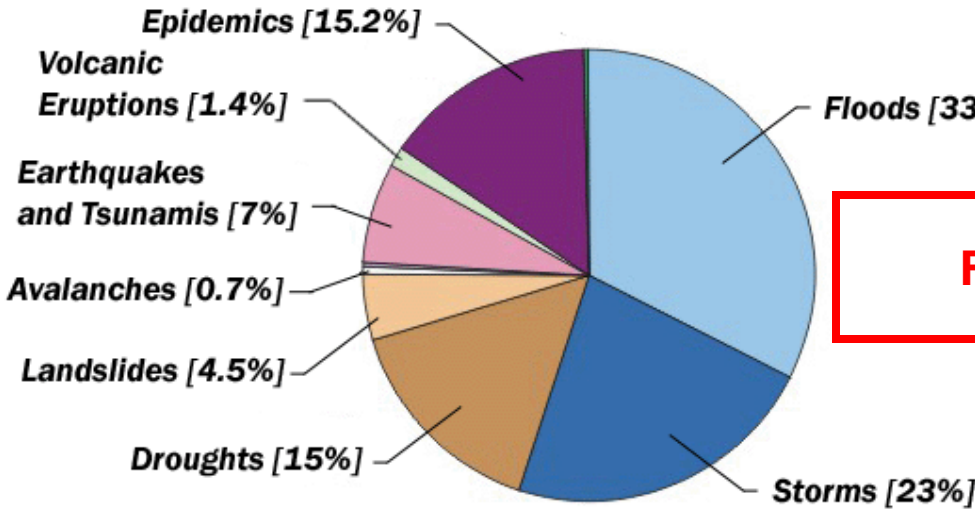
PER
YEAR

Global Impacts of Natural Hazards

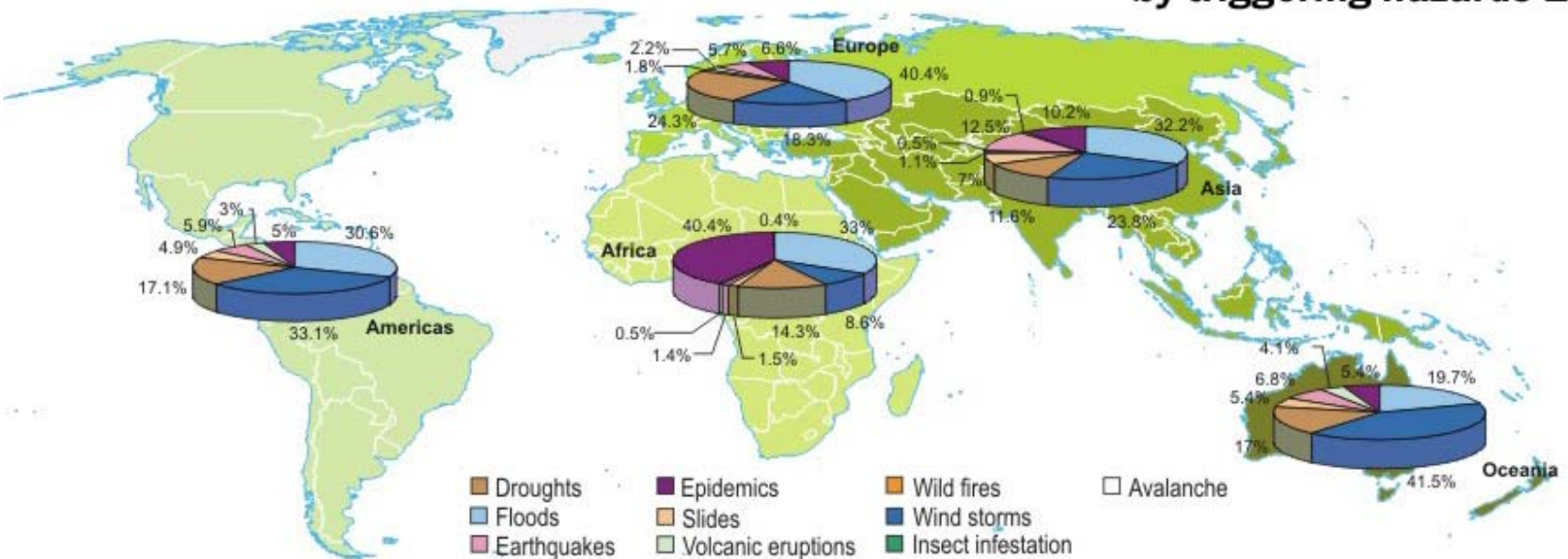
World distribution of disasters: by triggering hazards 1994-2003

Floods [33%]

Floods, storms, droughts, ... >75%



Regional distribution of disasters: by triggering hazards 1994-2003



Earthquakes, tsunamis -7% - horrific

Natural and Human-Induced Environmental Hazards

Planning Group formed in 2004 – Membership

Why, despite advances in the natural and social science of hazards and disasters, do losses continue to increase?

Gordon McBean (*Chairman*), Catastrophic Loss Reduction, Canada

Richard Keller, History, USA

Tom Beer, Environmental Risk, Australia

Allan Lavell, Ciencias Sociales, Costa Rica

Ian Burton, Geographer, Canada

Daniel Murdiyarto, Forestry Research, Indonesia

Chien-Jen Chen, Epidemiology, Taiwan

Victor Osipov, Environmental Geosciences, Russia

Opha Pauline Dube, Environmental Science, Botswana

Stephen Sparks, Earth Sciences, UK

Richard Eiser, Psychology, UK

Thomas Rosswall (*ex officio*), ICSU

Filipe Domingos Freires Lúcio, Meteorology, Mozambique

Reid Basher, ISDR

Harsh Gupta (*CSPR Liaison*), National Geophysical Research Institute, India

Badaoui Rouhban, Unesco

William Hooke, Meteorology, USA

Maryam Golnaraghi, WMO

Scope of the Research Programme

- **hydrometeorological and geophysical trigger events**, i.e., earthquakes; volcanoes; flooding; storms (hurricanes, typhoons, etc.); heat waves; droughts and fires; tsunamis; coastal erosion; landslides; aspects of climate change (for example, increases of extreme events); space weather and impact by near-Earth objects; and related events such as wild fires and locust outbreaks.
- effects of human activities on creating or enhancing disasters, including land-use practices.

Vision

- The Scientific Plan envisions an integrated approach to natural and human-induced environmental hazards through a combination of natural, health, engineering and social sciences, including socio-economic analysis, understanding the role of communications, and public and political response to reduce the risk.
- **The legacy of the Programme will be an enhanced capacity around the world to address hazards and make informed decisions on actions to reduce their impacts, such that in ten years, when comparable events occur, there will be a reduction in related loss of life, fewer people adversely impacted, and wiser investments and choices made by civil society.**

Objectives:

1. Characterization of hazards, vulnerability and risk

- 1.1: identifying hazards and vulnerabilities leading to risks;
- 1.2: forecasting hazards; and
- 1.3: dynamic modelling of risk.

2. Effective decision making in complex and changing risk contexts

- 2.1 Identifying relevant decision-making systems and their interactions
- 2.2 Understanding decision making in the context of environmental hazards
- 2.3 Improving the quality of decision-making practice

3. Reducing risk and curbing losses through knowledge-based actions

- 3.1 Vulnerability assessments
- 3.2 Effective approaches to risk reduction



Cross-Cutting Themes



1. Capacity building

1. Mapping capacity for disaster reduction
2. Building self-sustaining capacity at various levels for different hazards
3. Establishing continuity in capacity building

2. Case studies and demonstration projects

3. Assessment, data management and monitoring

1. Guidelines for consistent data management and assessments of risk, hazards and disasters
2. Applying local assessments globally and global assessments locally

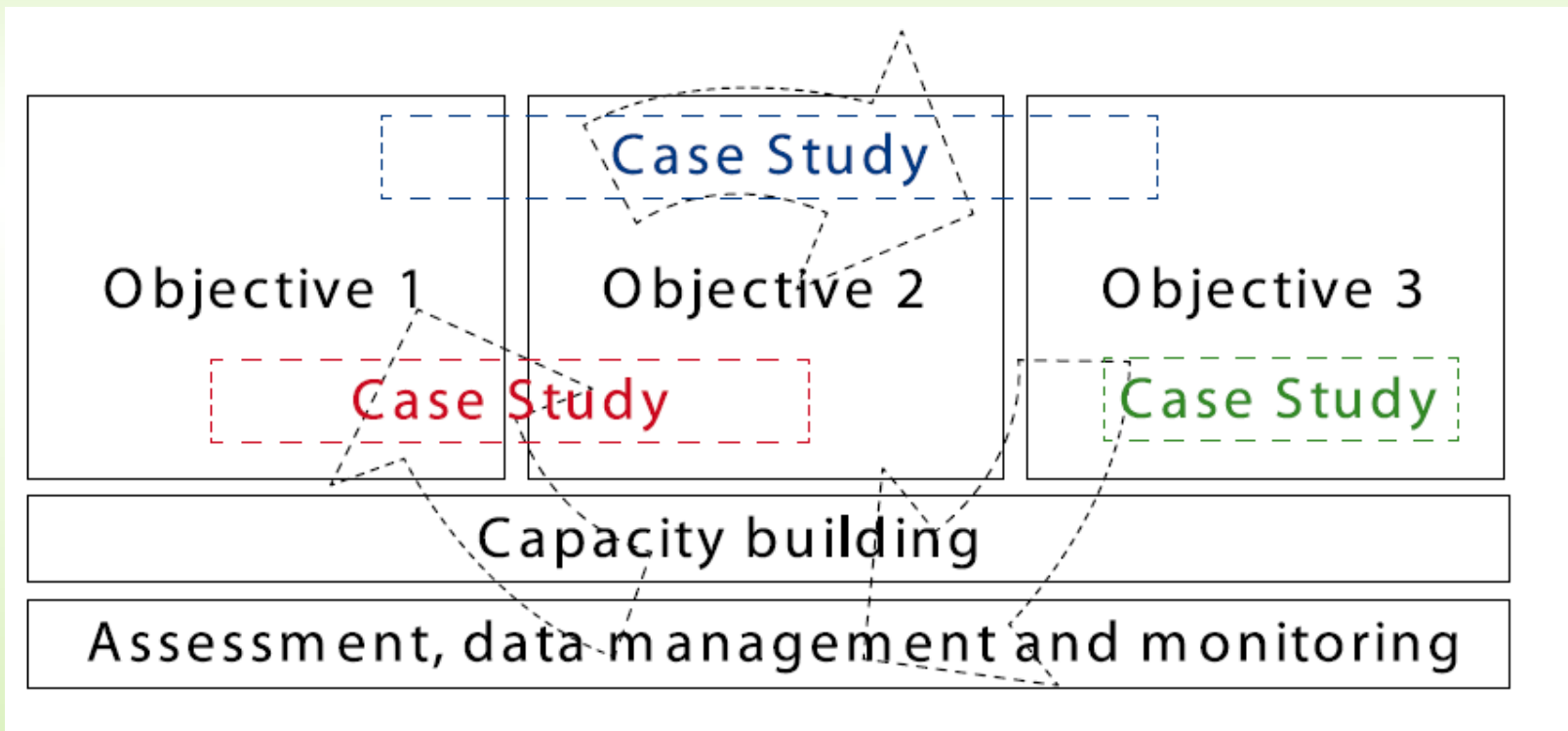


Figure 1. How the IRDR research projects, case studies and other activities would contribute across the research objectives.

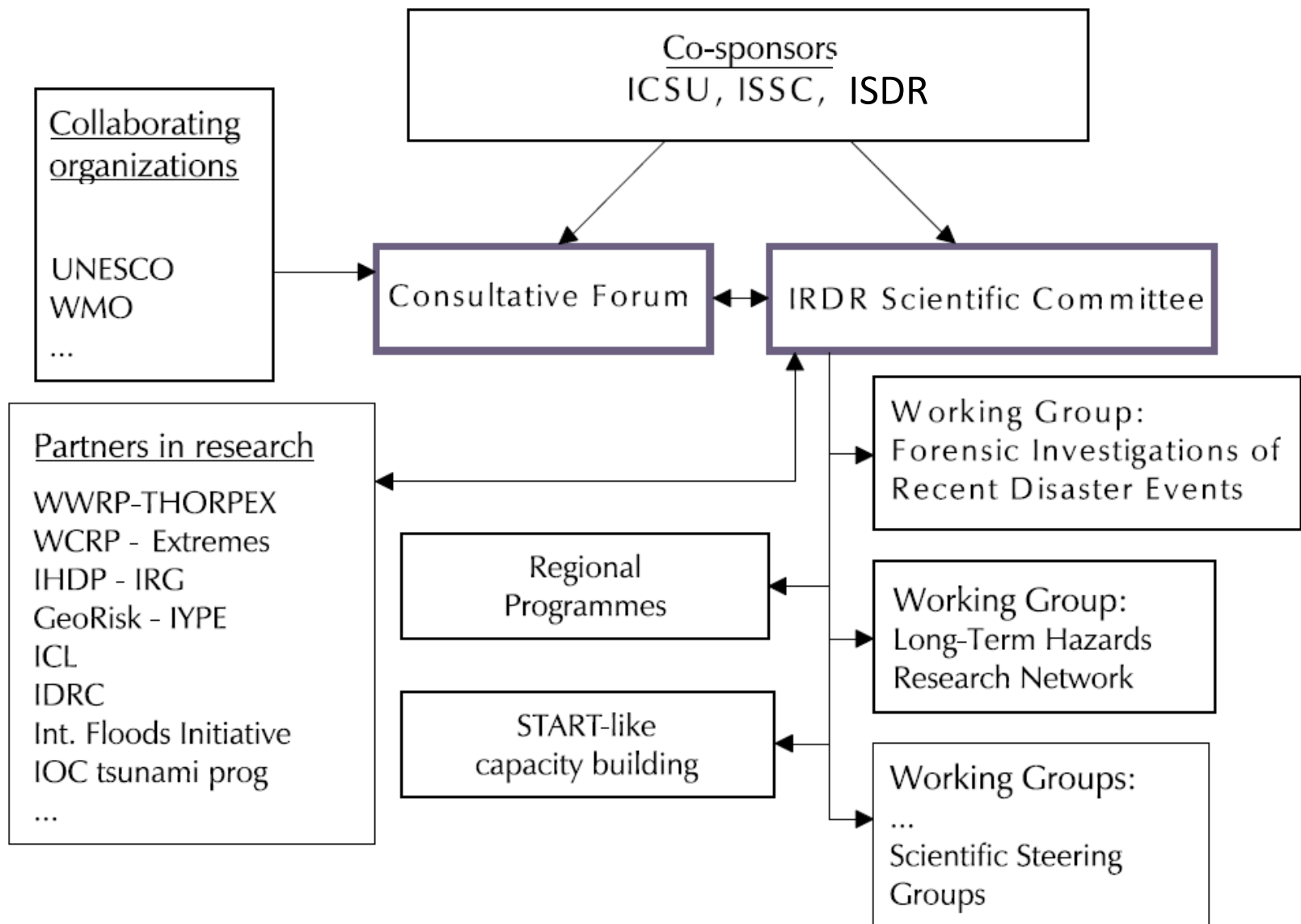


Figure 4. Proposed schematic structure for the IRDR Programme

Science Committee

1. **CARDONA, Omar Darío, Nat U Colombia, Colombia – earthquake eng**
2. **CHAN Kin Sek, Raymond, Civil Eng and Develop Dept, Hong Kong – landslide**
3. **CUTTER, Susan, USA - psychology**
4. **EISER, Richard, U Sheffield, UK – perception of risk**
5. **JOHNSTONE, David, Massey U, NZ –earth sciences, disaster management**
6. **LANG, Michel, CEMAGREF, France – hydrology, flood risk mitigation**
7. **LAVELL, Allan, FLACSO, Costa Rica – social and developmental aspects of risk and disasters**
8. **McBEAN, Gordon, Instit for Catastrophic Loss Reduction, U Western Ontario, Canada – climate change, meteorology, CHAIR**
9. **MODARESSI, Hormoz, BRGM, France – geohazards, coastal protection, remote sensing**
10. **PATEK, Maria, M of Agriculture, Forestry, Environment and Water Management, Austria – avalanches, torrents**
11. **RENN, Ortwin, U Stuttgart, Germany – environmental sociology**
12. **SPARKS, Steven, U Bristol, UK –volcanology, hazard management**
13. **SUHRKE, Astri, Chr. Michelsen Institute, Norway – political sciences)**
14. **TAKEUCHI, Kuniyoshi, ICHARM, Japan – hydrology, civil eng**
15. **VOGEL, Coleen, U Witswatersrand, South Africa – geography, environmental studies**
16. **WIRTZ, Angelika, Munich Re, Germany – economic data on disasters**

Ex Officio: Basher, Reid (UN ISDR), Hackmann, Heide (ISSC), Moore, Howard (ICSU)