
futureearth
research for global sustainability
Emerging Planetary Risks as Opportunities
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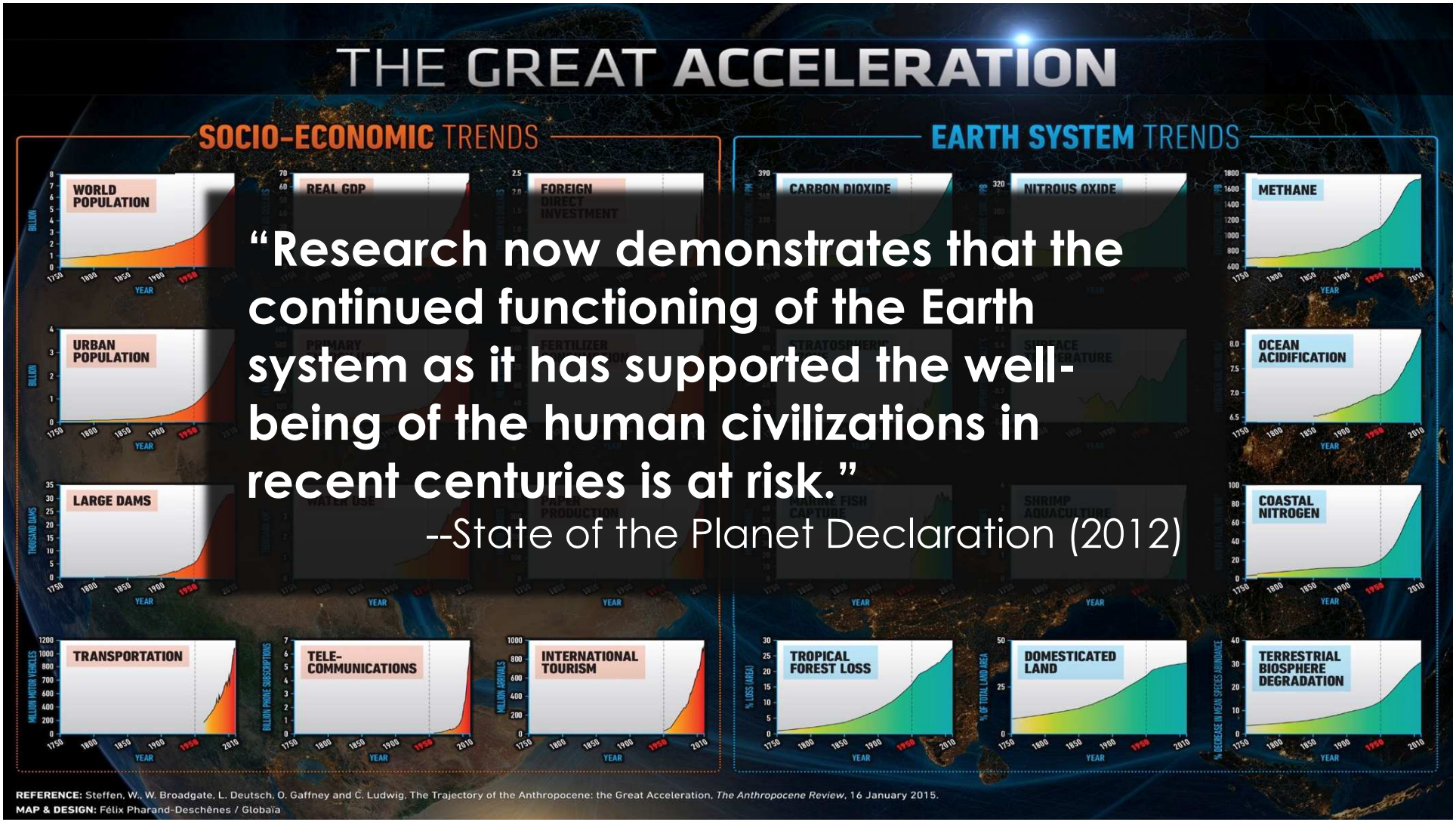
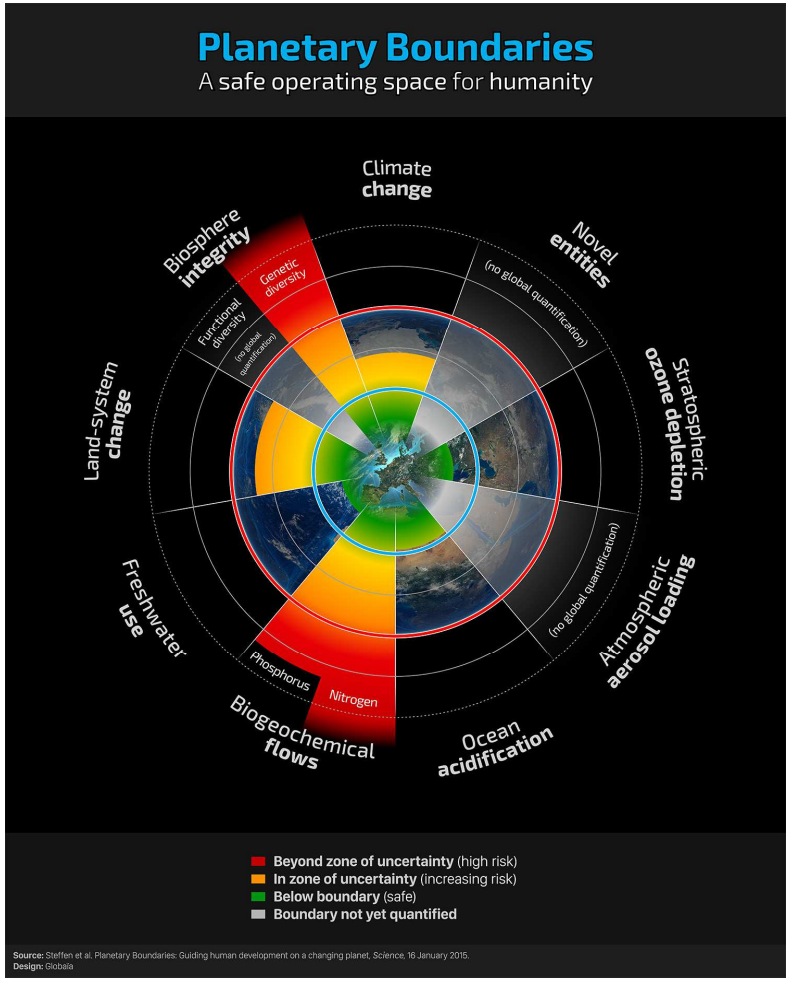
Outline

- Context – Acceleration, Planetary Boundaries, Anthropocene
- Future Earth as Science Platform for the Anthropocene
- Planetary Risks, Risk Informed Capital and Opportunities


THE GREAT ACCELERATION
SOCIO-ECONOMIC TRENDS
EARTH SYSTEM TRENDS
WORLD POPULATION
REAL GDP
FOREIGN DIRECT INVESTMENT
CARBON DIOXIDE
NITROUS OXIDE
METHANE
URBAN POPULATION
OCEAN ACIDIFICATION
LARGE DAMS
COASTAL NITROGEN
TRANSPORTATION
TELE-COMMUNICATIONS
INTERNATIONAL TOURISM
TROPICAL FOREST LOSS
DOMESTICATED LAND
TERRESTRIAL BIOSPHERE DEGRADATION
YEAR
"Research now demonstrates that the continued functioning of the Earth system as it has supported the well-being of the human civilizations in recent centuries is at risk."
--State of the Planet Declaration (2012)
REFERENCE: Steffen, W., W. Broadgate, L. Deutsch, O. Gaffney and C. Ludwig. The Trajectory of the Anthropocene: the Great Acceleration, The Anthropocene Review, 16 January 2015.
MAP & DESIGN: Félix Pharand-Deschênes / Globaïa

Planetary Boundaries

- Climate Change
- Novel Entities
- Stratospheric Ozone depletion
- Atmospheric aerosol loading
- Ocean acidification
- Biogeochemical Flows
- Freshwater use
- Land-system change
- Biosphere Integrity



What is Future Earth?

Future Earth

2013

Earth System Science Partnership

2001

WCRP

World Climate Research Programme

Established

1980

GLOBAL CHANGE

IGBP International Geosphere-Biosphere Programme

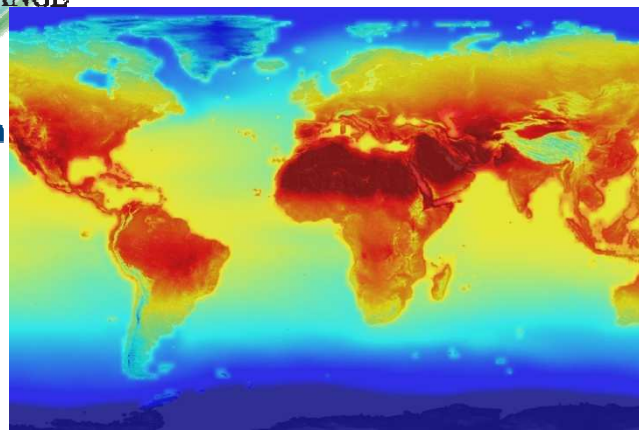
DIVERSITAS

1991

IHDP

International Human Dimensions Programme on Global Environmental Change

1996



futureearth is a research platform

for the **Anthropocene**…

CHALLENGES

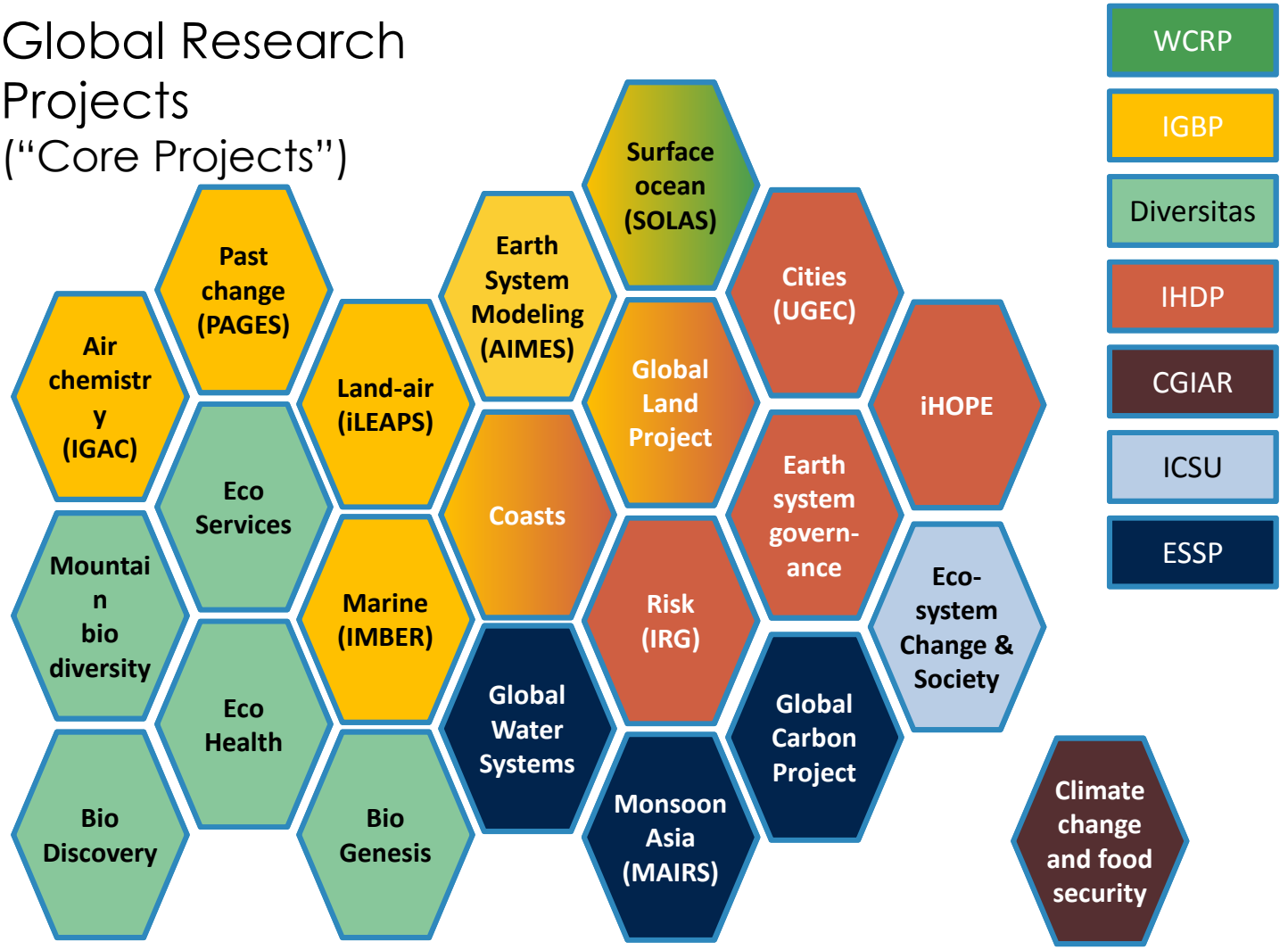
1. Unite around a common research agenda for global sustainability science

2. Engage societies in new ways

3. Encourage, catalyse and synthesise high quality research to support transformation

Knowledge-Action Networks

Global Research Projects ("Core Projects")

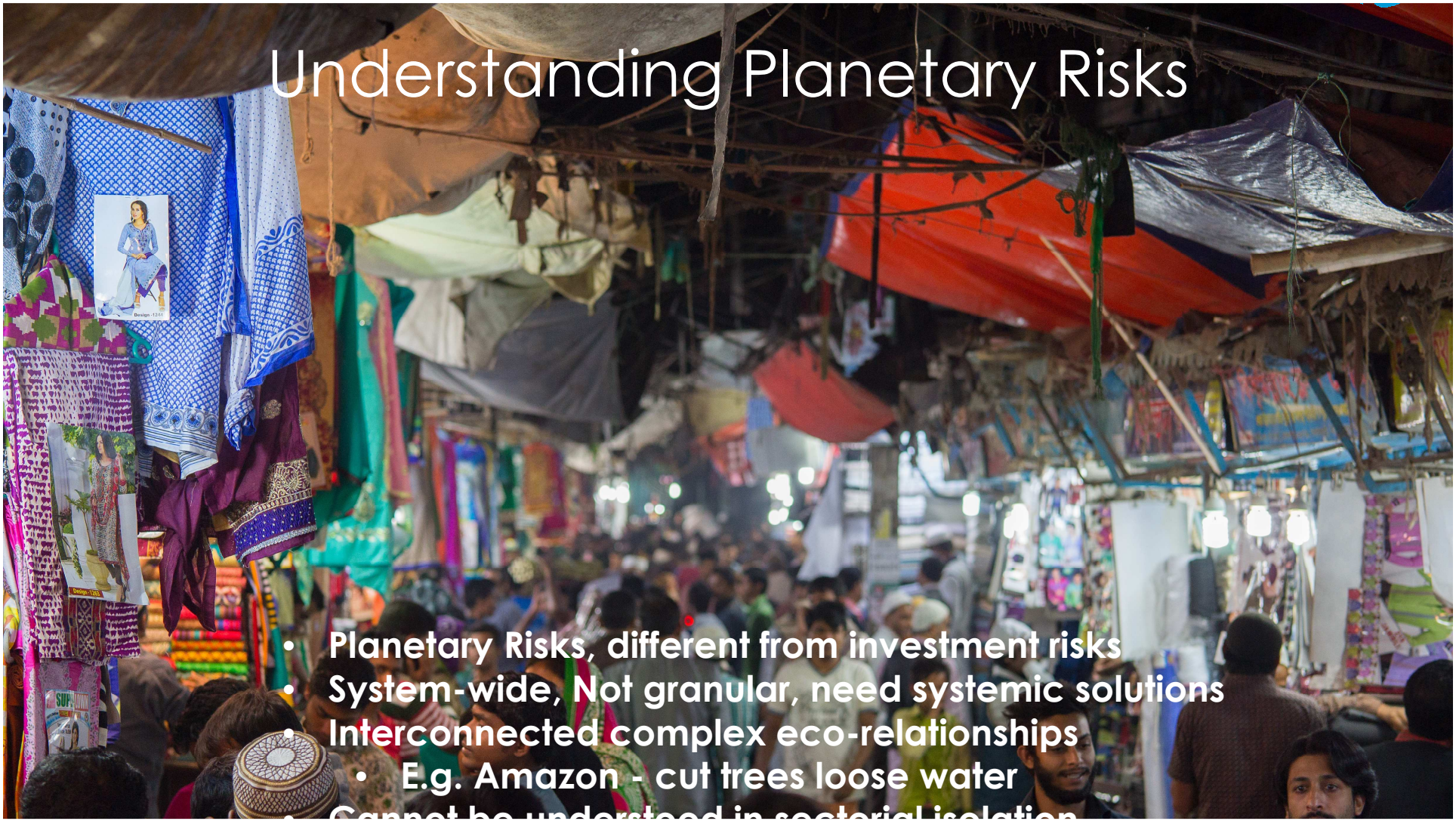


New Planetary Risks

- **Many new risks to planetary systems:**
  - **Food-water-energy nexus**
  - **Eco-health nexus**
  - **Urbanization – 2.5 Bil new urban dwellers**
  - **Natural assets**
  - **Oceans risk to food**
  - **Climate change, natural disasters, etc.**

they are mediated by economic inequality

Understanding Planetary Risks



- Planetary Risks, different from investment risks
- System-wide, Not granular, need systemic solutions
- Interconnected complex eco-relationships
  - E.g. Amazon - cut trees loose water
- Cannot be understood in sectorial isolation

Future Earth Disaster Risk KAN Framework

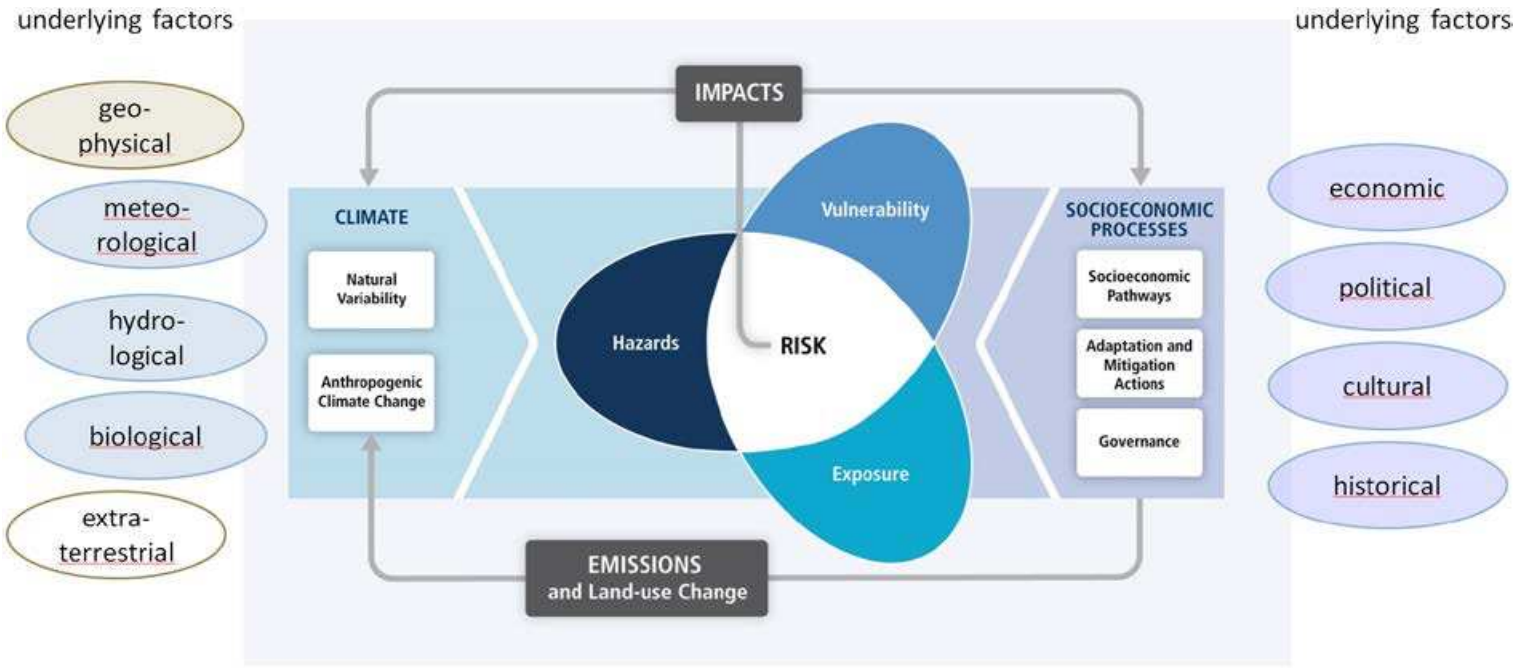


Fig.2: (modified after IPCC 2014, Fig SPM.1) Risk of geophysical, meteorological, hydrological, biological (*[10]) related impacts result from the interaction of geophysical, meteorological, hydrological, biological related hazards[11] (including hazardous events and trends) with the vulnerability and exposure of human and natural systems, which emerge from socio-economic processes affected by underlying economic, political, cultural and historical factors.

Future Earth Solutions - Risk Informed Capital

- Investors need a new risk calculus to assess investment opportunities
- Risk Informed Capital:, new tools for assessing, new pathways for directing capital
- New ways of linking risks to capital
  - Risk scales (individual/Organizational to regional/global,
  - Methods (quantitative to qualitative and integrated
  - Decision making & practices – Participative, Stakeholder Engaged

New Planetary Risk Management

Planetary Risk Calculus:

a) Bioregional risk and toll systems

b) Global carbon tax

c) Carbon De-subsidization & Re-subsidization

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