The making of a riskier future: how our decisions are shaping future disaster risk

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The making of a riskier future

Key messages from research:

1. Disasters risks are *rapidly increasing*. However, the full effects of climate change *may not be felt* for another 15-30 years.
2. Risk assessments typically *fail to account* for changing climate, population, urbanization and environmental conditions *reducing the opportunity* to highlight *long-term, cost-effective* options for risk reduction.
3. The drivers of future risk are *within the control of decision makers today* – there is a *huge opportunity today* to manage the risks of tomorrow.

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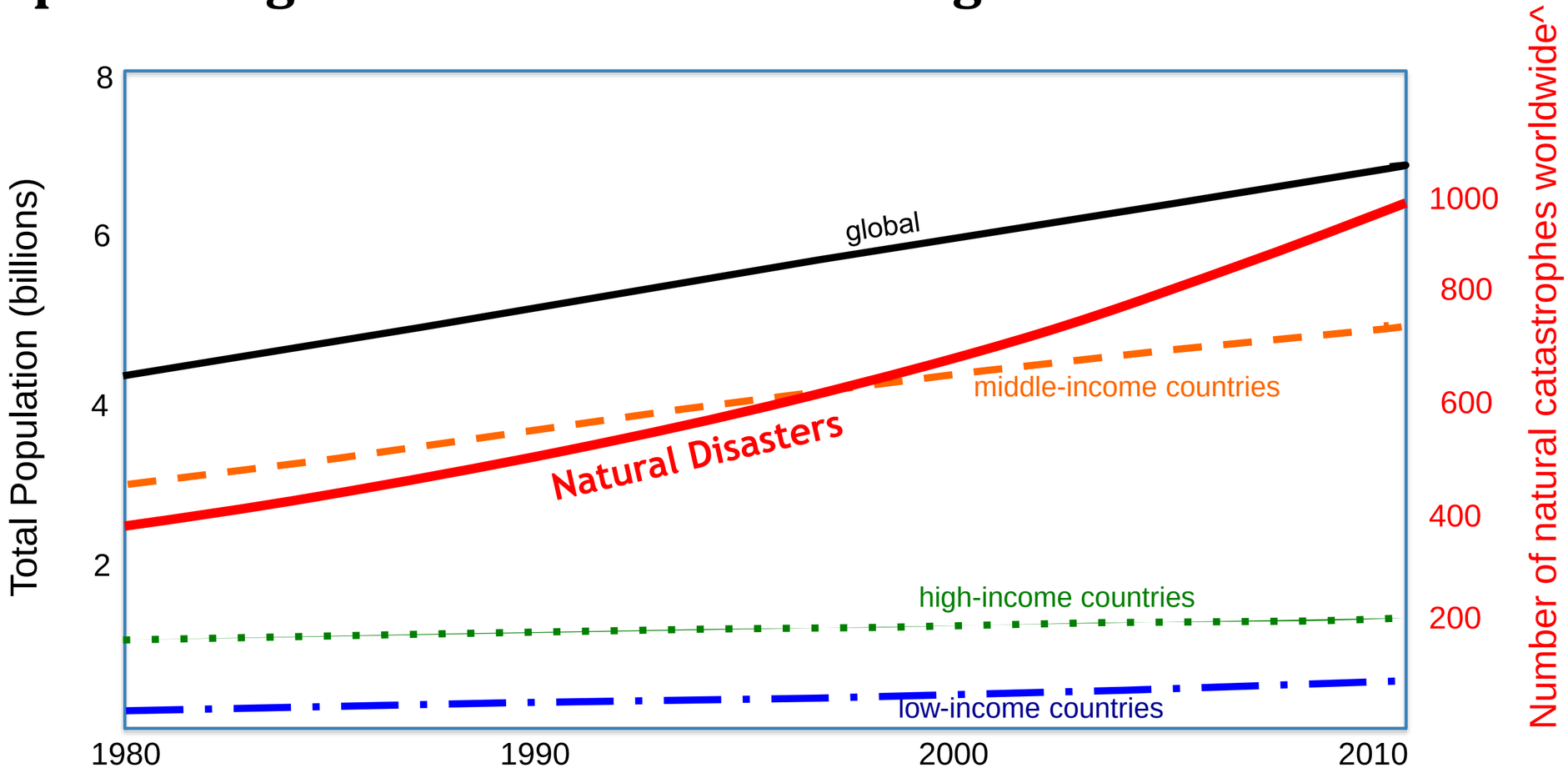
Risk is dynamic and driven by each part of the risk equation

- For example, rapid urbanization affects
  - **hazard** (eg. increased runoff),
  - **exposure** (eg. high concentration of assets and infrastructure) and
  - **vulnerability** (eg. informal settlements)

Risk is increasingly rapidly…

Global population growth is one factor driving this increase



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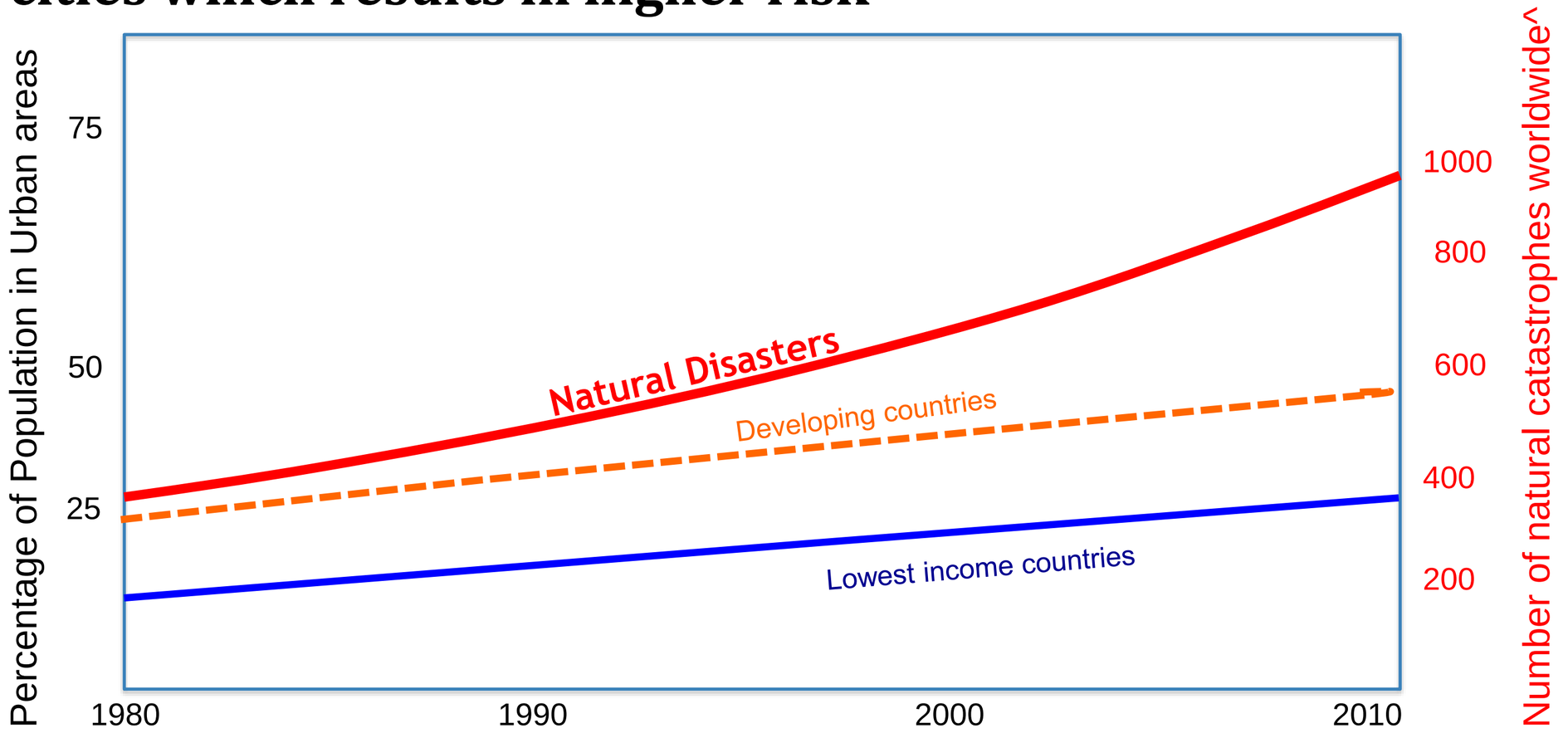
Risks are increasingly rapidly…

Urbanization is increasing the proportion of the global population living in cities which results in higher risk



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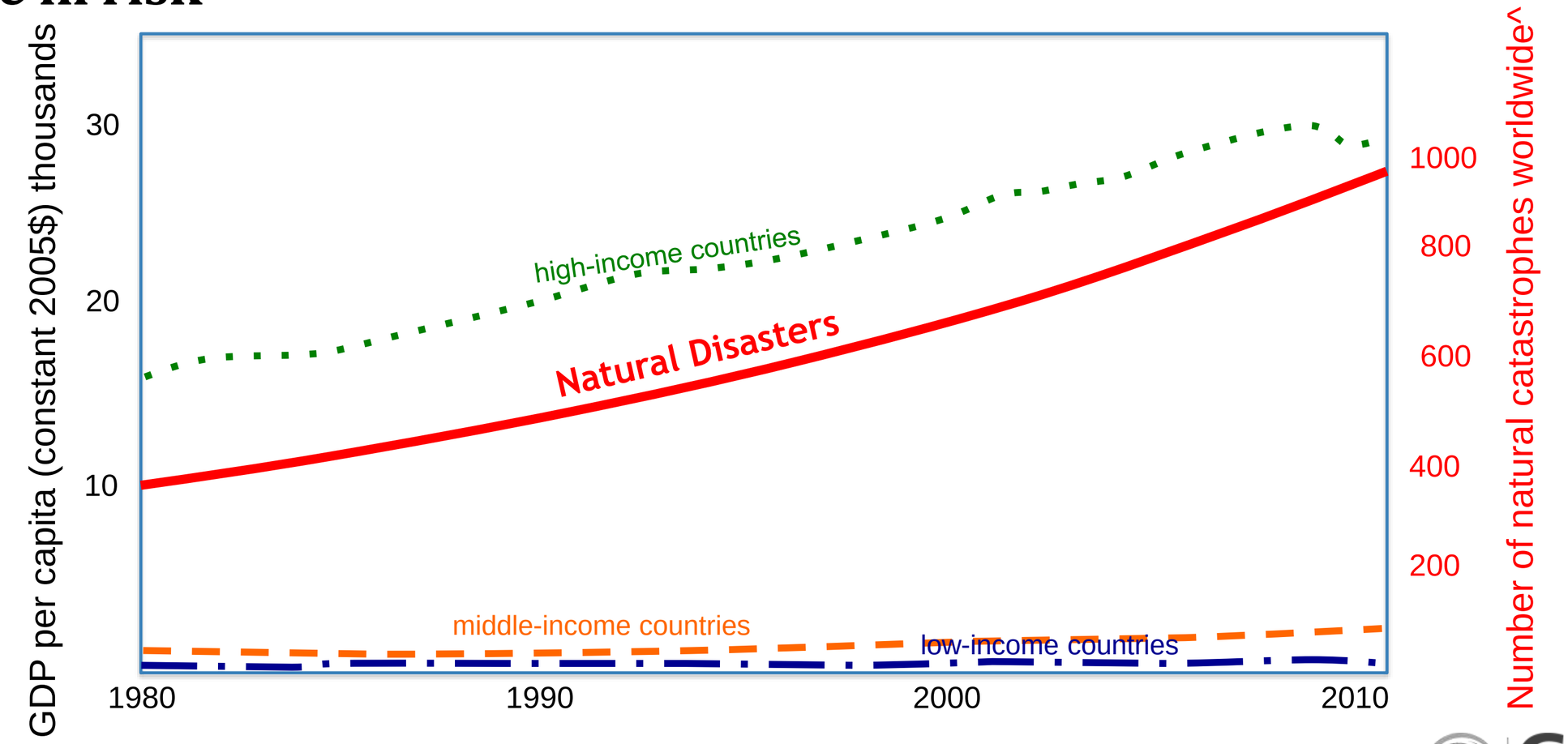
Risks are increasingly rapidly…

GDP growth, particularly in high-income countries, is also driving the increase in risk



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Risks are increasingly rapidly…

Uncontrolled development is compounding risk increase

- Informal construction rarely conforms to building code in the fastest growing urban areas, increasing vulnerability
- This issue maybe as prevalent in the formal construction industry where building codes are not enforced
- Property owners are often unaware of the risks

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Risks are increasingly rapidly ….

The numbers:

- Global flood damage is expected to **increase by a factor of 20** by 2100. This increase is 90% driven by population and GDP growth
- Increase in disaster losses in some regions is **higher than GDP growth**
- **Jakarta: Annual damage in 2030 is expected to increase by 263 percent**. Includes effect of precipitation, sea level, land use, and subsidence. **Subsidence alone contributes an increase of 173 percent of this increase.**

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Risks are increasingly rapidly…

… but we are yet to feel the full expected effects of climate change on disaster losses

- Climate change impacts have already been identified on a case-by-case basis and are expected to affect global trends in the next decades
- Climate change is expected **to double global population affected by droughts** by end of century

- Without adaptation to increased sea level and subsidence, **annual loss in 136 coastal cities projected to increase US$6 billion (2010) to over US$1 trillion (2070)**: adaptation is essential (Hallegatte et al. 2013)

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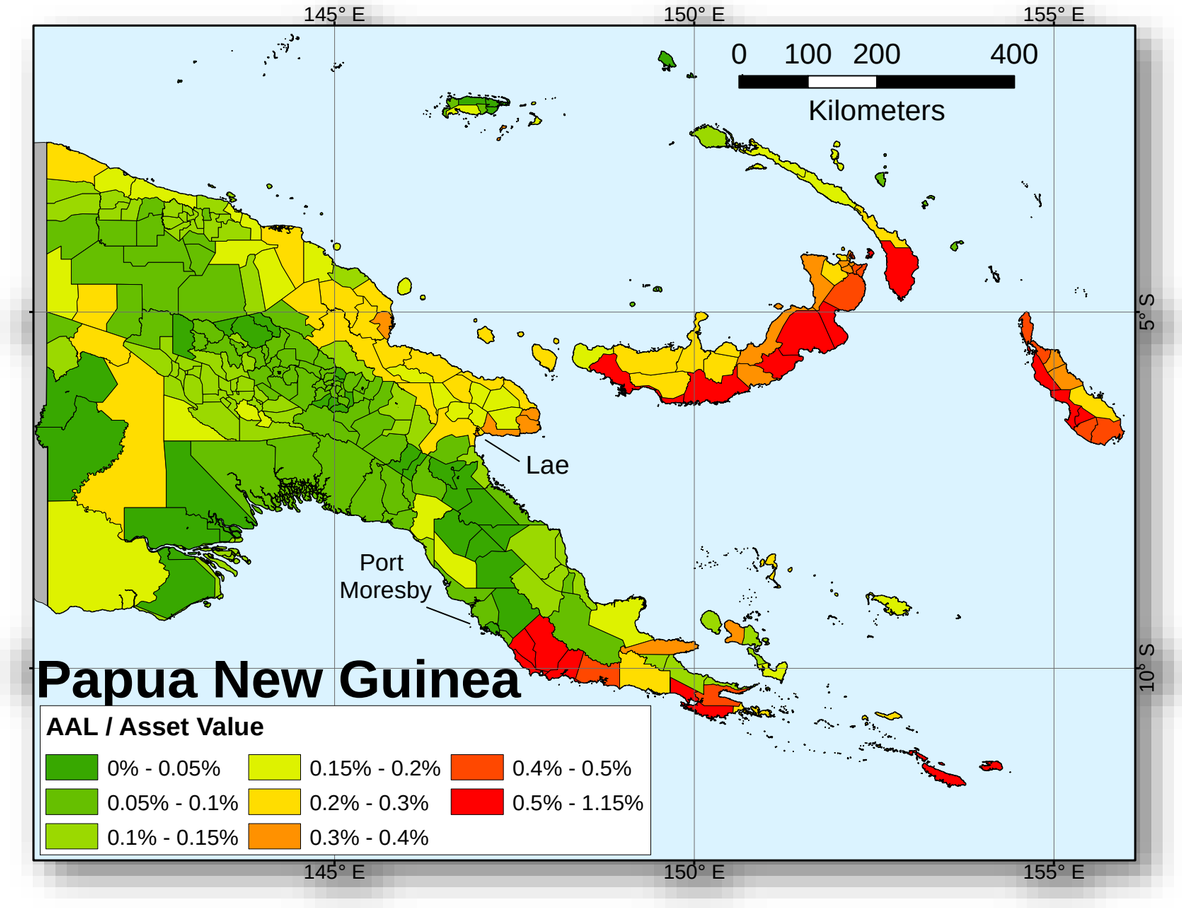
If disaster risks are dynamic…

… why are our risk assessments static?

- The process of risk assessment comes from the insurance sector which only requires a “snapshot” of risk today
- Data challenges often hinder assessment of the risk today
- Previously there were limited models of socio-economic growth
- Advances in modelling future climate has not been translated into impacts
- Lack of awareness of the power of highlighting current and future risk



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If disaster risks are dynamic, why are our risk assessments static…?

Progress to quantify dynamic risk

- Projections of the drivers of risk are becoming more common and more available to risk modelers
- Promotion and investment in open data reduces the time and resources required to develop models. The same funding can now go further – that is to explore future risk
- Efforts are ongoing to reduce the uncertainties in regional trends and magnitudes of change under future climates
- More emphasis is being placed on effective translation of dynamic risk assessments into actionable information (cost / benefit assessment)

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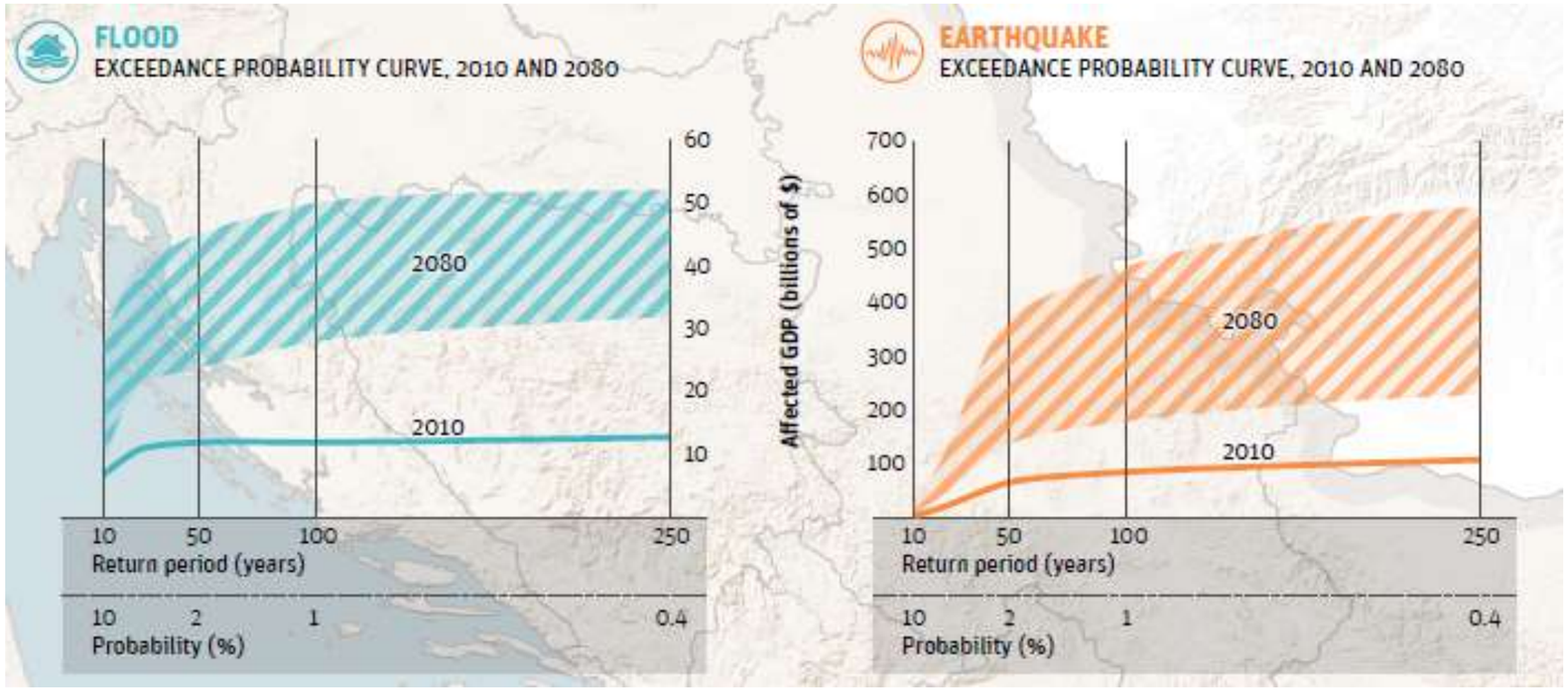
If disaster risks are dynamic, why are our risk assessments static…?

Progress to quantify dynamic risk

- GFDRR risk assessments increasingly consider current and future risks.
  - 31 countries in Europe/Central Asia - flood and earthquake
  - Ethiopia, Kenya, Uganda, Senegal &Niger - flood, drought, landslide, earthquake & volcanic eruption
  - Afghanistan - flood, drought, avalanche, earthquake & landslide



The decisions that we can take today to reduce risk in the future

Mitigate climate change effects to:

- ❑ reduce major rises in hydro-meteorological disaster risk
- ❑ reduce sea-level rise which will increase risks from flood, storm surge, tsunami, coastal erosion etc
- ❑ reduce further disruptive impacts on natural cycles (e.g., El Nino / La Nina)
- ❑ constrain the increase in temperature and limit the projected extremes

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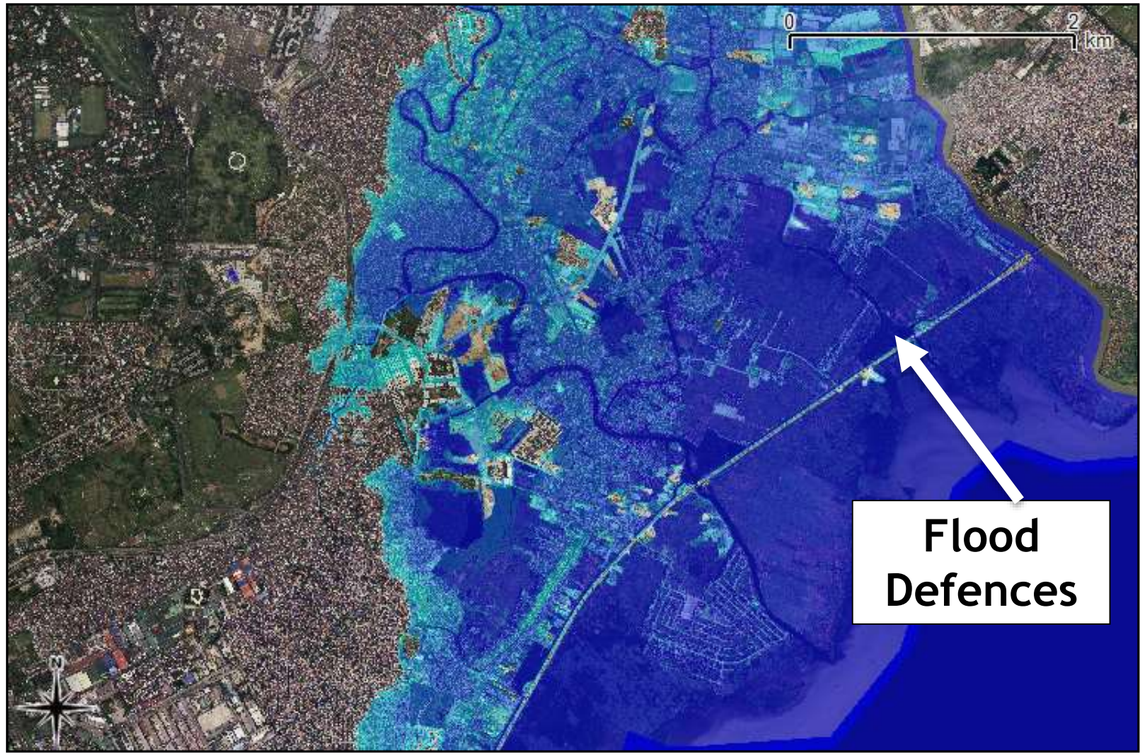
The decisions that we can take today to reduce risk in the future

Manage Urban Expansion in Disaster Prone Areas

Reduce deforestation = reduced landslide/flood

Resilient urban densification & expansion

Ensure basic water and sanitation = reduced flood



What could be achieved?

- Limiting urban expansion in flood prone areas in Indonesia could **reduce future losses by up to 80%**

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The decisions that we can take today to reduce risk in the future

Control construction practices

Re-purpose hazardous land

Compliance with building codes

Trained & informed builders, masons and building owners

Appropriate construction to improve habitability

What could be achieved?

- Enforcing building codes in Kathmandu valley could reduce the number of buildings **heavily damaged by earthquakes by 20% in 15 years**

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The decisions that we can take today to reduce risk in the future

Promote resilient practices

Structures that safeguard lives

Structures that remain fully functional

Resilient "internal" critical contents

What will it take?

- Clear decisions on how resilient structures need to be
- Consideration of critical building contents and the hazard profile

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The decisions that we can take today to reduce risk in the future

Promote green/soft surfaces in urban areas

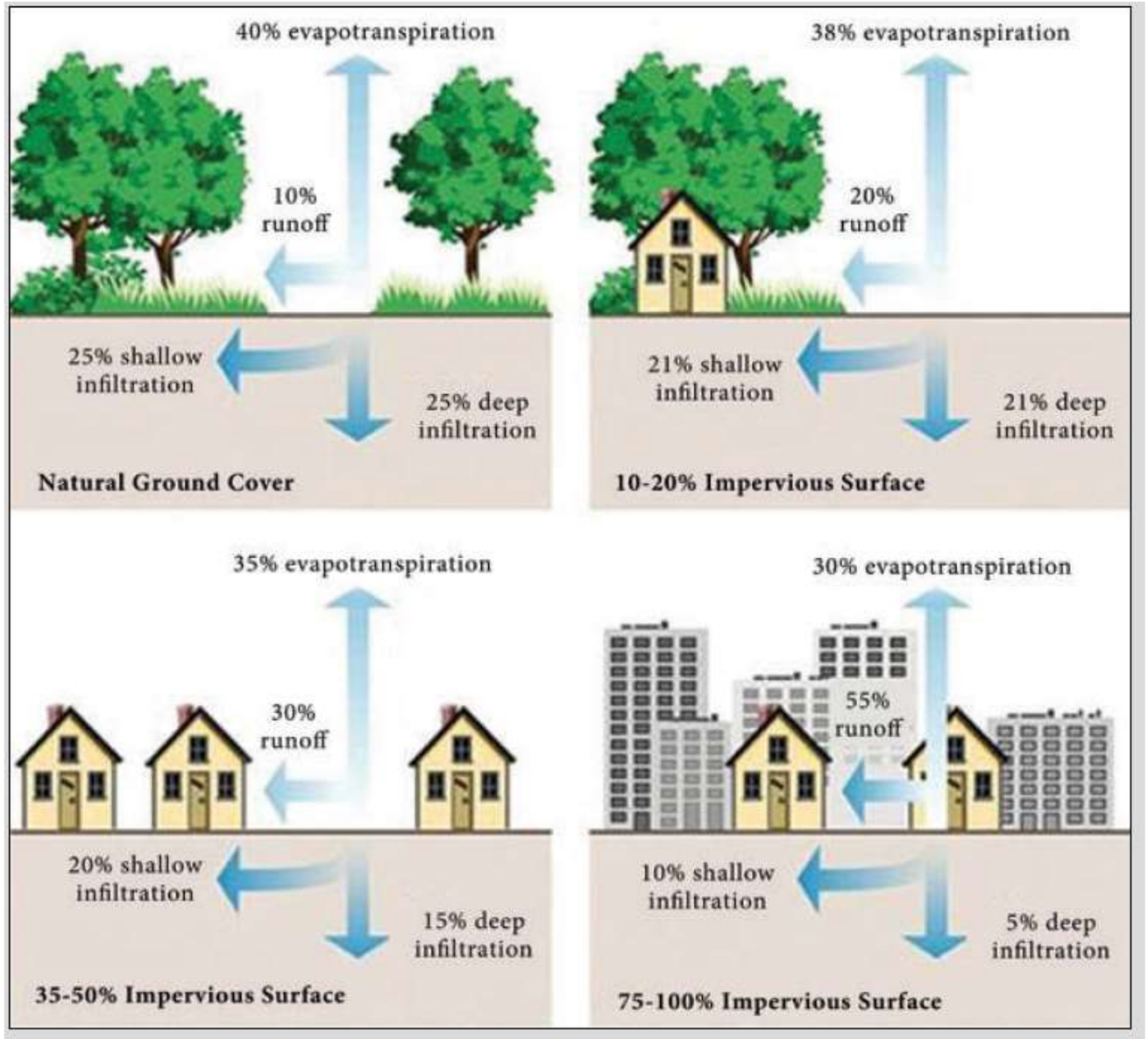
Reduce urban flooding

Sustain water supplies

Reduce land subsidence

Where could this work?

- All urban areas
- Islands, particularly coral atolls



Roesner, 2014

The decisions that we can take today to reduce risk in the future

Improved data collect to enable long-term cost-benefit analysis

- Timely collection and updating of fundamental datasets
  - Population information, construction registers
  - Development of projections in construction and population growth/movement
- High-resolution elevation data to accurately model flows from river and coastal floods and to predict sea level rise impacts
- Data on flood and coastal protection to improve accuracy in modelling flood and coastal hazards

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The making of a riskier future

In summary:

1. Disasters risks are *rapidly increasing* and the full effects of climate change *may not be felt* for another 15-30 years. **We need to take action to change this trend.**

2. Risk assessments typically *fail to account* for changing climate, population, urbanization and environmental conditions *reducing the opportunity* to highlight *long-term, cost-effective* options for risk reduction. **We need to modify our approach to risk assessments.**

3. The drivers of future risk are *within the control of decision makers today* – there is a *huge opportunity today* to manage the risks of tomorrow. **We need to broaden our engagement to decision makers who have the power to act on these drivers.**

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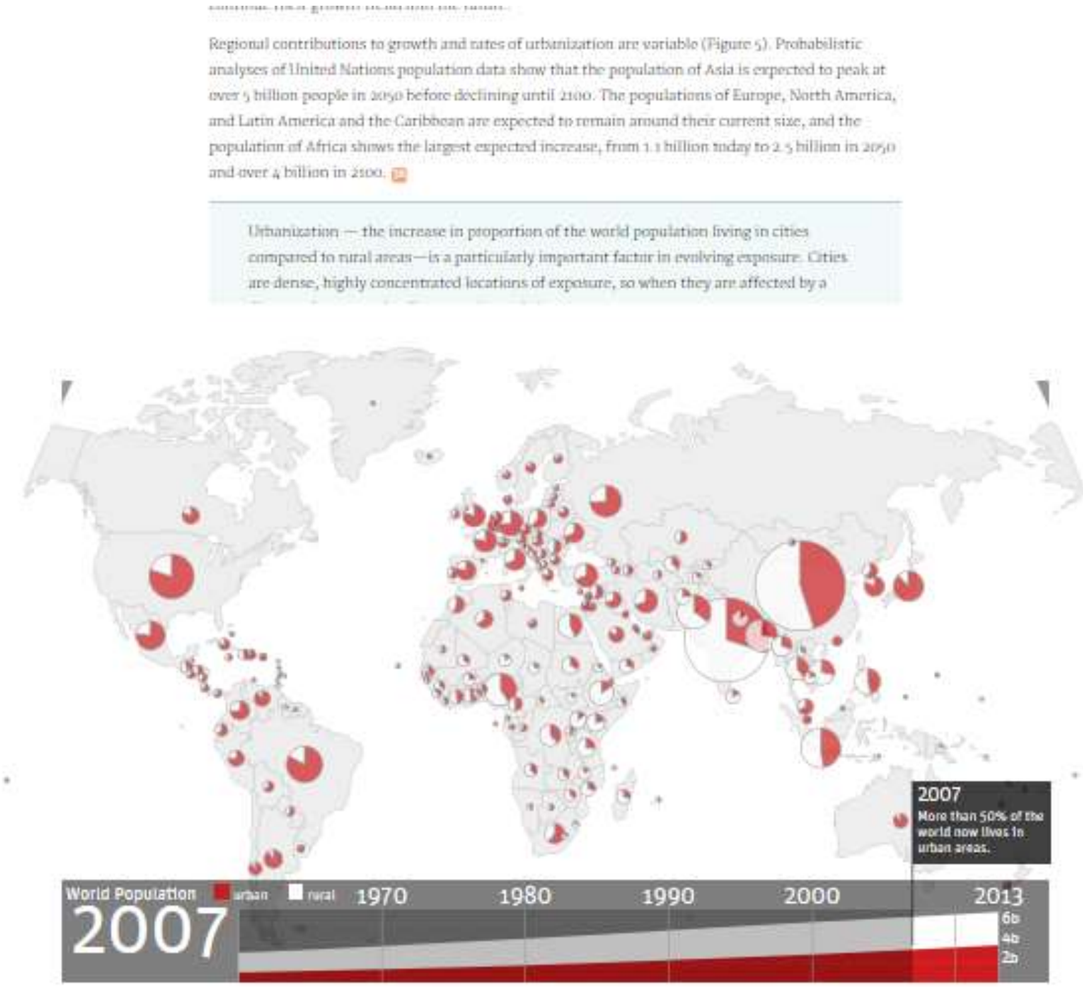
Moving beyond a paper publication…

At launch, this work will be highlighted through:

- ❑ Interactive report on GFDRR website
- ❑ Infographics and visualizations
- ❑ Outreach to scientific journals and the media
- ❑ Executive summary

Launch date to be determined…



Acknowledging our Partners

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