



PBL Netherlands Environmental
Assessment Agency

Global trends in flood risks towards 2050 in an urbanizing world

24/09/2014 14:00 - 15:45
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Content

- For whom
- Why & What
- How (the model)

Results:

- Comparison of safety levels
- Vulnerable cities
- Governance & adaptation



Global Report on Water and Sanitation in the World's Cities



Towards a world of cities in 2050 An outlook on water-related challenges

1. Baseline scenario
2. Water supply and sanitation
3. Water quality: nutrients in surface water
- 4. Flood risks**



UNIVERSITY
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UNESCO-IHE
Institute for Water Education

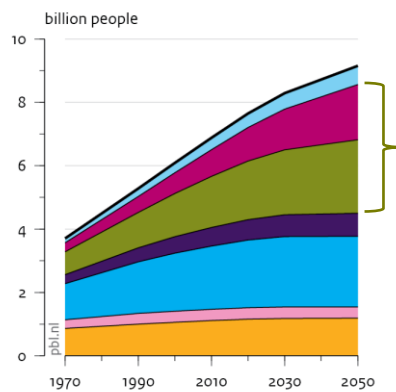


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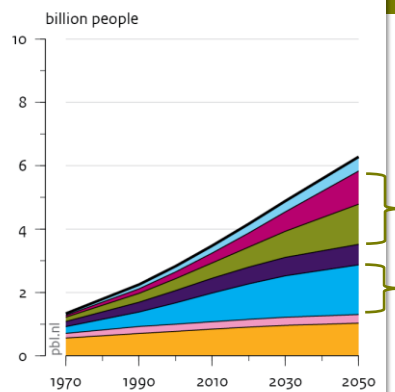
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Population and urbanisation under the Baseline Scenario

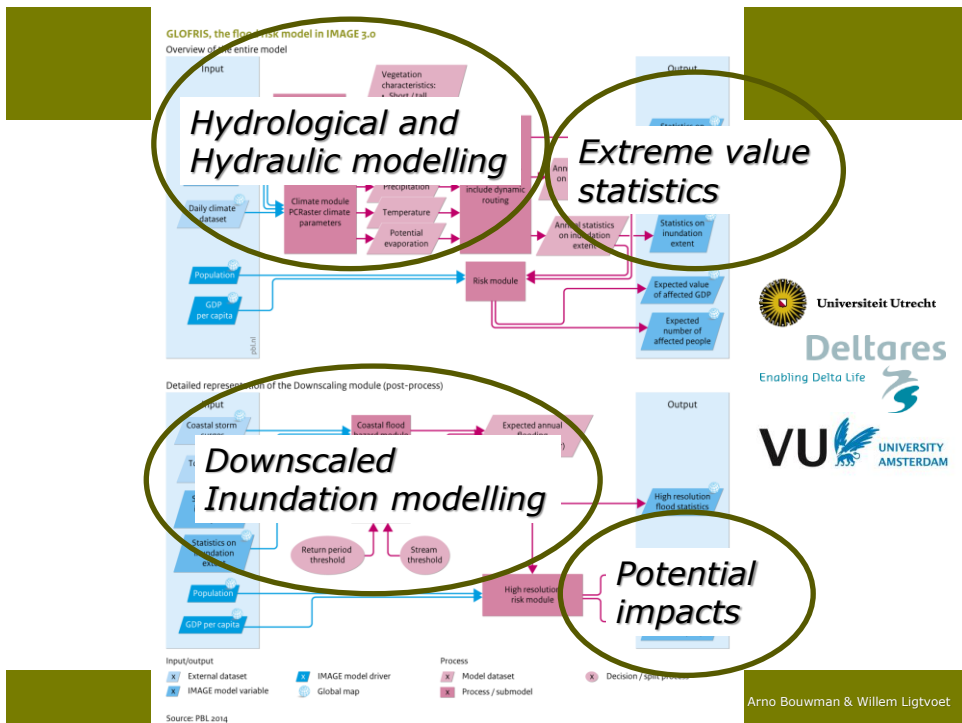
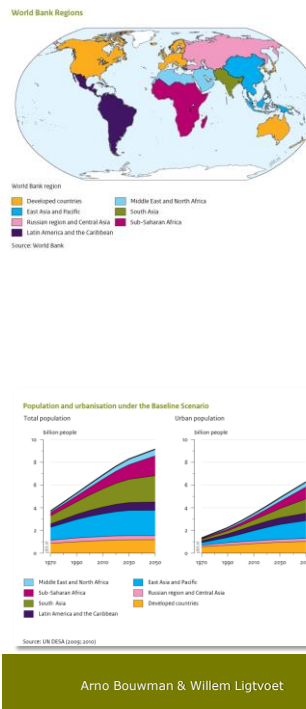
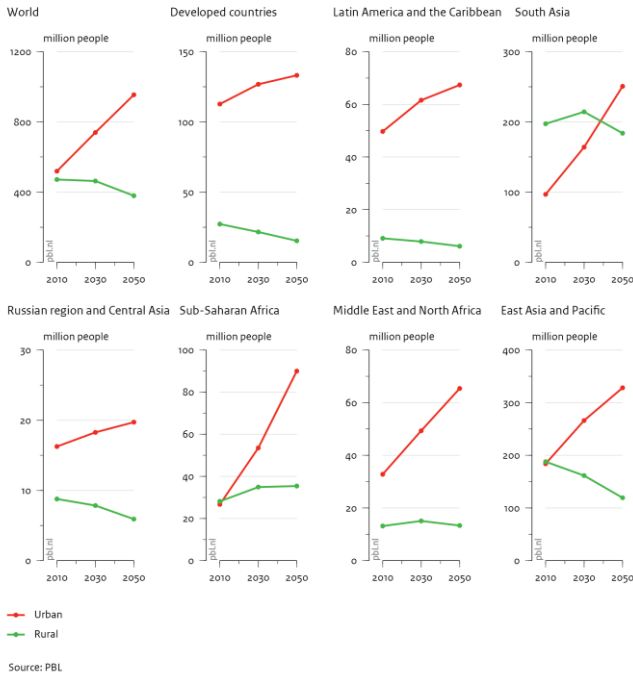
Total population

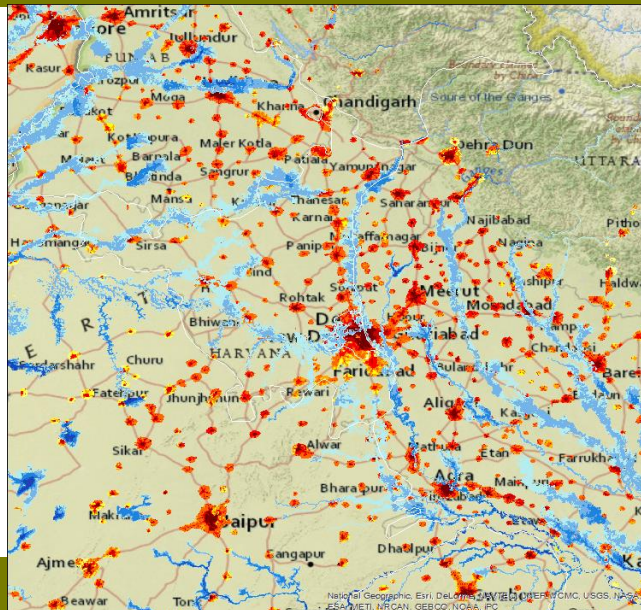


Urban population



Population in flood-prone areas





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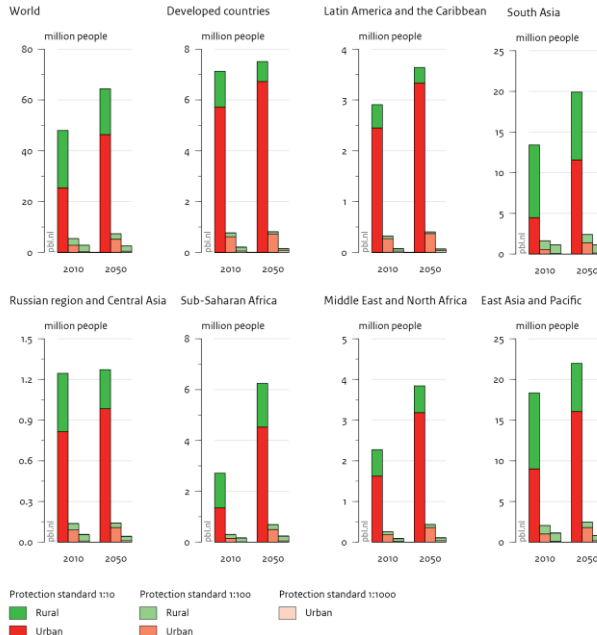


Protection levels



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Annual exposed population to floods



Source: PBL

Assuming
protection levels

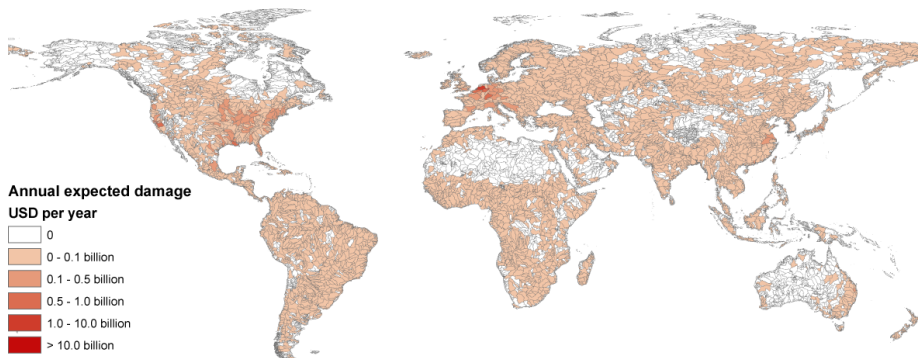
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Research priorities

Flood protection: 100 year return period

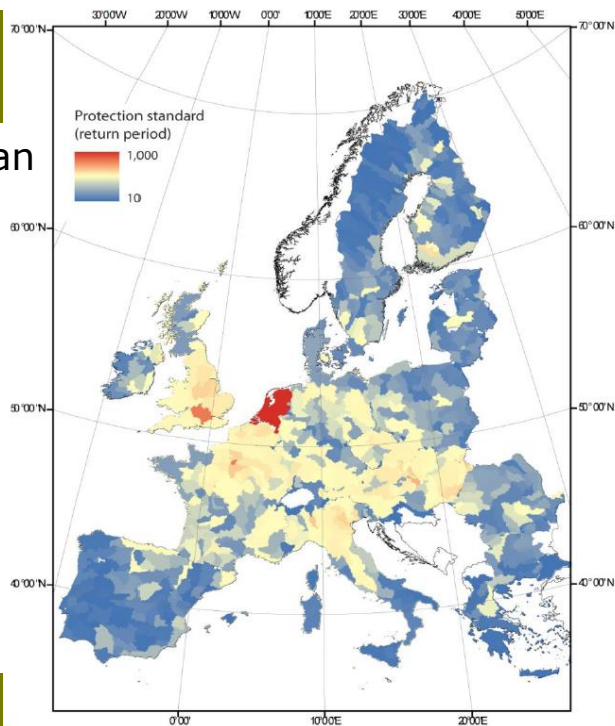


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Brenden Jongman



Inventory of protection standards



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Comparison of theoretical improved protection standards show that:

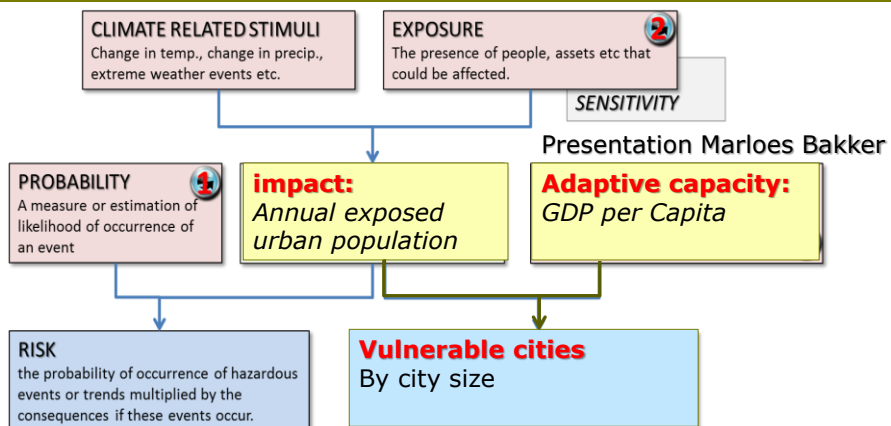
- the annual exposure to floods can be substantially reduced.
- the potential cost of flood protection is limited.
Cost of the flood management system in the Netherlands is about 0.3% of GDP, or USD 120 to 160 per person per year.
- research priority on protection standards.

Vulnerable Cities



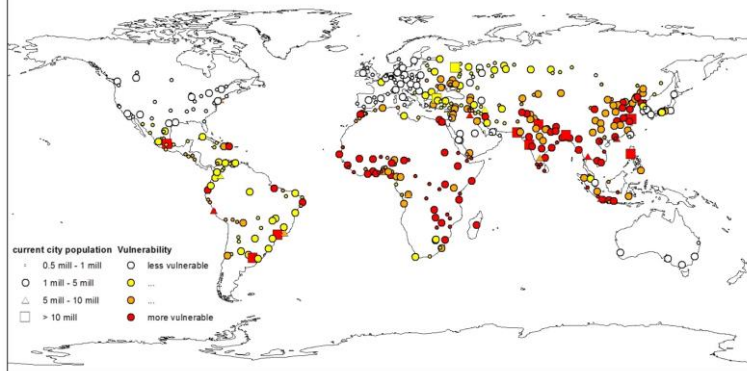
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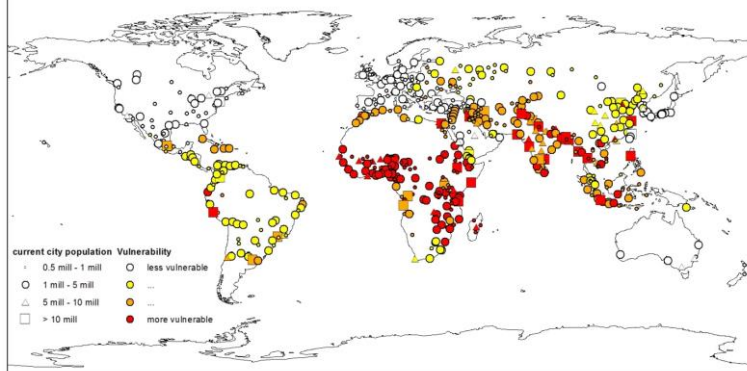
Cities by size class and vulnerability rank for floods 2010.
Vulnerability based on annual expected exposed population and GDP per capita.



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Cities by size class and vulnerability rank for floods 2050.
Vulnerability based on annual expected exposed population and GDP per capita.



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According to the Baseline Scenario:

- there may be 670 cities with 500,000 inhabitants or more by 2050, of which 88 will have over 5 million inhabitants.
- Of these cities, 50% will fall in the highest vulnerability ranking with respect to flooding, based on exposed population and GDP per capita.
- The most vulnerable megacities will be Dhaka, Kolkata, Shanghai, Mumbai, Jakarta, Bangkok and Hoh Chi Minh City.

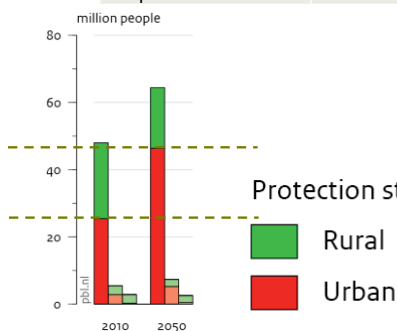
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Annual exposed URBAN population

	2010	2050	2010	2050
Protection 1: 10	25.4 million	46.4 million	40%	41%
In delta's	16.1 million	32.2 million	26%	29%
No protection standard	62.8 million	113.0 million		

World



UN Atlas: 44 percent of us live in coastal areas



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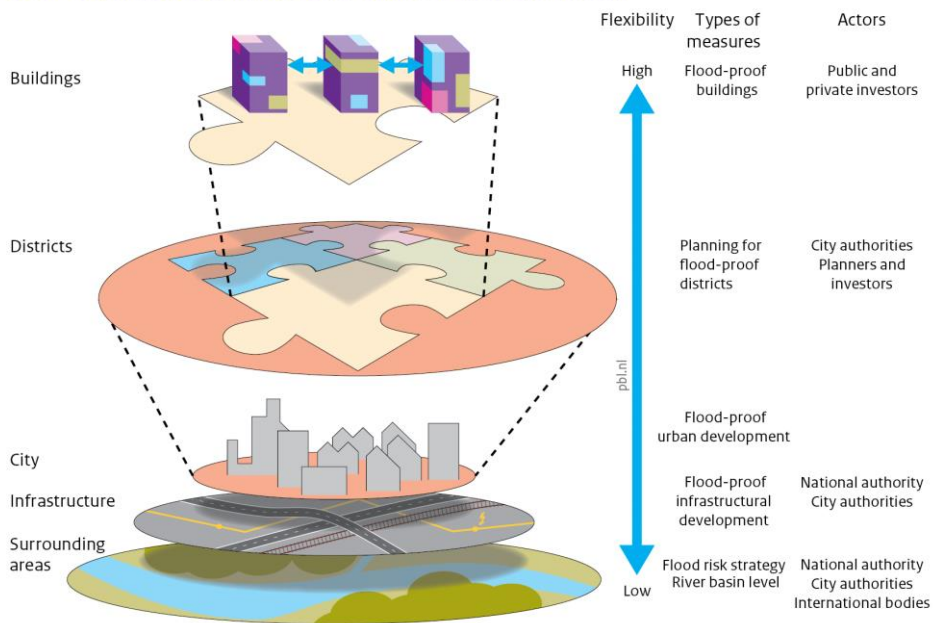
Governance & adaptation



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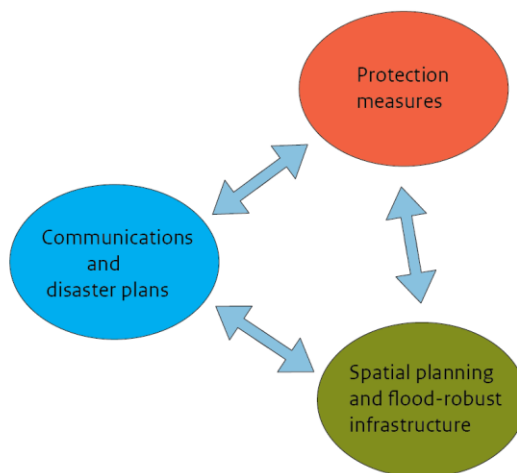
Adaptation measures at various scales within the urban environment

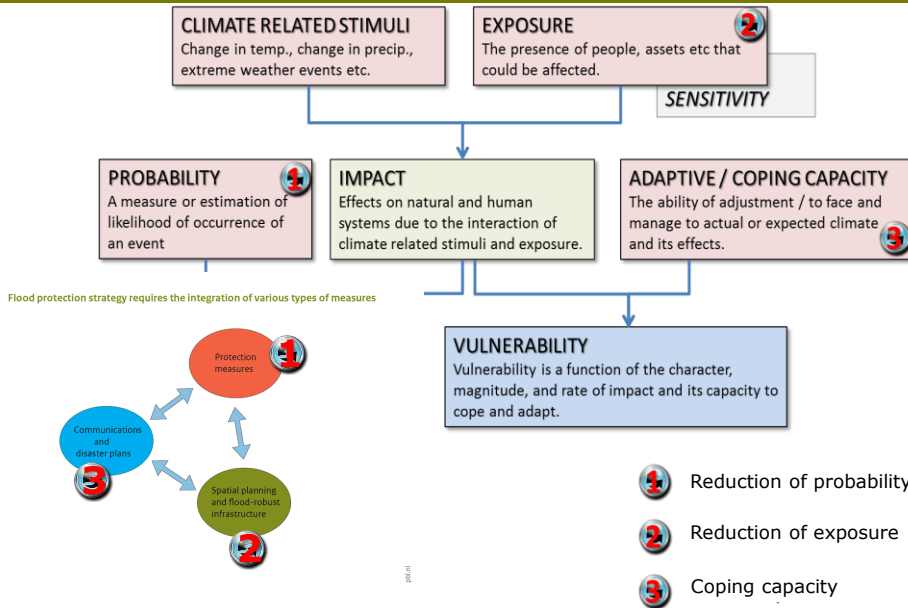


The following major governance challenges can be identified:

- bridging scales: from river basin to flood-proof buildings;
- integration of flood risks in urban planning and design;
- integration of climate change in urban planning and design;
- communication and involvement of stakeholders.

Flood protection strategy requires the integration of various types of measures





Thank You